THE IMPACT OF CREDIT RISK REPORTING RULES ON FINANCIAL ANALYSTS' INFORMATION ENVIRONMENT

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Table of Contents

TABLE OF CONTENTS .... **III**

LIST OF TABLES .... **VII**

LIST OF FIGURES .... **VIII**

LIST OF APPENDICES .... **IX**

LIST OF ABBREVIATIONS .... **X**

PREFACE .... **XII**

ACKNOWLEDGEMENT .... **XIII**

DECLARATION .... **XIV**

CERTIFICATE .... **XV**

ABSTRACT .... **XVI**

CHAPTER 1 INTRODUCTION **1**

1.1 INTRODUCTION 2
1.2 THE GLOBAL FINANCIAL CRISIS 2007-08 3
1.2.1 The credit market crisis *6*
1.3 FAIR VALUE MEASUREMENT 9
1.4 CREDIT RISK REPORTING 12
1.4.1 Loan loss provisioning *13*
1.4.1.1 Incurred loan loss model (IAS 39) *16*
1.4.1.2 Expected loan loss model (IFRS 9) *19*
1.5 RESEARCH QUESTIONS AND OBJECTIVES OF THE STUDY 26
1.5.1 First research question and objective *28*
1.5.2 Second research question and objective *30*
1.5.3 Third research question and objective *32*
1.5.4 Fourth research question and objective *35*
1.6 RATIONALE OF THE STUDY AIM 37
1.7 SCOPE OF THE THESIS 40
1.8 THESIS STRUCTURE 41
1.9 CONCLUSION 44

CHAPTER 2 LITERATURE REVIEW 45

2.1 INTRODUCTION 46
2.2 HISTORICAL OVERVIEW OF DEVELOPMENTS IN FVA 48
2.3 THEORETICAL RESEARCH IN FAIR VALUE ACCOUNTING 53
2.3.1 Quality and reliability of fair values 53
2.3.2 Role of conceptual framework 56
2.3.3 Role of asset/liability approach 58
2.4 EMPIRICAL RESEARCH IN FAIR VALUE ACCOUNTING 61
2.4.1 Valuation and value relevance research 61
2.4.2 Presentation format and fair value accounting 67
2.4.3 Fair Value measurement and global financial crisis 69
2.5 FINANCIAL VOLATILITY AND FINANCIAL STABILITY 72
2.5.1 Deviations from the efficient market hypothesis 74
2.5.2 Economic policy 77
2.5.3 Credit rating agencies 78
2.6 THE EFFECT OF PROCYCLICALITY IN BANKING SECTOR 79
2.6.1 Banks' performance 80
2.6.1.1 The institutional memory hypothesis 80
2.6.1.2 Implementation of capital standards 83
2.6.1.3 Supervisory regulations 85
2.7 LOAN LOSS PROVISIONING 88
2.8 CONCLUSION 94

CHAPTER 3 RESEARCH METHODOLOGY AND METHODS 97

3.1 INTRODUCTION 98
3.2 ONTOLOGY AND EPISTEMOLOGY 99
3.3 RESEARCH PARADIGMS 106
3.4 RESEARCH PARADIGM UNDERLYING THIS STUDY 108
3.5 RESEARCH METHODS 112
3.6 SECONDARY DATA ANALYSIS 113
3.6.1 Time period and sample selection 114
3.6.2 Secondary data methods of analysis 116
3.6.3 Data 118
3.6.3.1 Gross charge off (GCO) 118
3.6.3.2 Loan loss provisions (LLP) 118
3.6.3.3 Model of loan loss provisioning (IFRS) 118
3.6.3.4 Audit specialisation (AUDIT) 118

3.6.3.5 Bank size (SIZE) 119
3.6.3.6 Banking sector credit risk (RANK) 119
3.6.3.7 Loan portfolio (LOA) 119
3.6.3.8 Non-performing loans (NPL) 122
3.7 SURVEY RESEARCH 122
3.7.1 Validity of survey questionnaire 129
3.7.2 Reliability of survey questionnaire 131
3.7.3 Pilot testing of survey questionnaire 134
3.7.4 Ethical considerations 135
3.8 CONCLUSION 137

CHAPTER 4 SECONDARY DATA ANALYSIS 138

4.1 INTRODUCTION 139
4.2 DESCRIPTIVE STATISTICS 139
4.3 DATA ANALYSES 153
4.3.1 Regression models 154
4.3.2 Results of secondary data analyses 165
4.3.2.1 Hypothesis 1 172
4.3.2.2 Hypothesis 2 174
4.3.2.3 Hypothesis 3 179
4.3.2.4 Hypothesis 4 184
4.3.2.5 Effect of time period 188
4.4 CONCLUSION 192

CHAPTER 5 SURVEY ANALYSIS 194

5.1 INTRODUCTION 195
5.2 QUESTIONNAIRE INFORMATION 196
5.3 QUESTIONNAIRE SAMPLE 197
5.4 DESCRIPTIVE STATISTICS 202
5.5 ANALYSES ACCORDING TO THE QUESTIONNAIRE SECTIONS 210
5.5.1 Kruskal-Wallis and Mann-Whitney U tests 210
5.5.2 Design of loan loss provisioning rules (Section B) 214
5.5.3 IAS 39 Incurred loss model (Section C) 223
5.5.4 IFRS 9 Expected loss model (Section D) 235
5.6 SURVEY QUESTIONNAIRE RESULTS OVERVIEW 248
5.7 CONCLUSION 254

CHAPTER 6 CONCLUSION **256**

6.1 INTRODUCTION 257

6.2 MAIN FINDINGS AND CONTRIBUTION TO KNOWLEDGE 261

6.2.1 Findings from secondary data analyses 261

6.2.2 Findings from primary data analyses 269

6.2.3 Link between the findings from primary and secondary data analyses 273

6.2.4 Implications of the findings for relevant stakeholders 277

6.2.5 Final conclusions 282

6.2.6 Findings overview and knowledge contribution 283

6.3 LIMITATIONS OF THE STUDY 285

6.4 FUTURE RESEARCH OPPORTUNITIES 289

6.5 CONCLUSION 292

BIBLIOGRAPHY **293**

APPENDICES **330**

List of Tables

Table 1.1: Trends in global stock markets. 5
Table 1.2: Issuance of mortgage-backed securities..8
Table 2.1: FVA in FASB Accounting Standards Codification (ASC)............................52
Table 2.2: FVA in IASB International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS). 52
Table 3.1: Ontologies according to Easterby-Smith, Thorpe and Jackson (2015)........100
Table 3.2: Implications of positivism and social constructionism. 105
Table 3.3: Sample selection details. 116
Table 3.4: Codes associated with the banking sector risk. 121
Table 3.5: Results of reliability testing of questionnaire pilot stage. 135
Table 4.1: Descriptive statistics of raw data. 143
Table 4.2: Descriptive statistics using normalised data (all banks). 146
Table 4.3: Spearman's correlation matrix for all variables. 151
Table 4.4: Results of regression models. 169
Table 5.1: Response rate of questionnaire data collection. 199
Table 5.2: Characteristics of the questionnaire survey participants. 201
Table 5.3: Descriptive statistics of survey questions. 203
Table 5.4: Correlation matrix. 208
Table 5.5: Descriptive statistics of survey questions according to the sub-groups.......211
Table 5.6: Summarised questionnaire results (Section B). 221
Table 5.7: Summarised questionnaire results (Section C). 227
Table 5.8: Summarised questionnaire results (Section D). 238
Table 6.1: Summary of secondary data results. 269

List of Figures

Figure 1.1: Subordination structure..7
Figure 1.2: Loan loss recognition under alternative loan loss accounting systems. 14
Figure 1.3: Three-stage impairment model for financial assets under IFRS 9. 21
Figure 1.4: Credit losses recognition under IFRS 9 Expected loss model, FVA model (ED 2009) and IAS 39 Incurred loss model. 24
Figure 2.1: Procyclicality in financial sector. 73
Figure 3.1: Four paradigms developed by Burrell and Morgan (1979). 106
Figure 3.2: Conceptual Framework – Survey questionnaire...126
Figure 4.1: Easing of credit standards...191

List of Appendices

Appendix 1: Survey Questionnaire. 331
Appendix 2: Standard Ethical Approval Form...339
Appendix 3: Results of descriptive statistics (Table 4.1A)..341
Appendix 4: Results of descriptive statistics (Table 4.1B)..342
Appendix 5: Results of descriptive statistics (Table 4.1C)..343
Appendix 6: Results of descriptive statistics using normalised data for all banks (Table 4.2). 344
Appendix 7: Results of Spearman's correlation matrix for all variables (Table 4.3). ..345
Appendix 8: Results of regression analyses of secondary data (Table 4.4).................347
Appendix 9: Results of descriptive statistics of survey questions (Table 5.3).............353
Appendix 10: Correlation matrix of primary data (Table 5.4).....................................354
Appendix 11: Results of descriptive statistics of survey question according to the sub-groups (Table 5.5). 355
Appendix 12: Results of summarised questionnaire results (Table 5.6).......................358
Appendix 13: Results of summarised questionnaire results (Table 5.7).......................362
Appendix 14: Results of summarised questionnaire results (Table 5.8).......................366
Appendix 15: Secondary panel data...370
Appendix 16: Primary data. 480

List of Abbreviations

AAA	American Accounting Association
AIMR	Association for Investment Management and Research
ASC	Accounting Standards Codification
ASU	Accounting Standards Update
BCBS	Basel Committee on Banking Supervision
CEO	Chief executive officer
CF	Conceptual Framework
CFA	Chartered Financial Analyst
EC	European Commission
ECB	European Central Bank
ECL	Expected credit losses
ED	Exposure Draft
EEC	European Economic Community
EIU	Economist Intelligence Unit
ESMA	European Securities and Markets Authority
EU	European Union
FASB	Financial Accounting Standards Board
FSF	Financial Stability Forum
FVA	Fair value accounting
GAAP	Generally accepted accounting principles
GAO	US Government Accountability Office
GFC	Global financial crisis 2007/2008
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standard
IMF	International Monetary Fund
LLP	Loan loss provision(s)
MBS	Mortgage-backed security
PPE	Property, plant and equipment
PWC	PricewaterhouseCoopers

SEC	Securities and Exchange Commission
SFAS	Statement of Financial Accounting Standards
SSAP	Statements of Standard Accounting Practice
TARP	Troubled Assets Relief Program
UCL	University College London
UK	United Kingdom
US	The United States
OLS	Ordinary least squares regression

Preface

This dissertation is submitted for the degree of Doctor of Philosophy at the University of Buckingham. The research described herein was conducted under the supervision of Doctor Gurcharan Singh and Doctor Anwar Halari at the Buckingham Business School between January 2017 and December 2019.

This work is to the best of my knowledge original, except where references are made to previous literature. Neither this work, nor any substantially similar dissertation has been or is being submitted for any other degree, diploma or other qualification at any other university. This dissertation contains less than 100,000 words.

Acknowledgement

This thesis is the culmination of a long journey through which I benefited from the support of many remarkable individuals.

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Finally, I would like to thank to all the individuals who took the time to participate and contribute to this study. This thesis would have not been completed without the assistance that I have been blessed with to receive.

Declaration

Name of Candidate: Dusan Andrejcik

Registration No.: 0802442

Name of Degree: Doctor of Philosophy

Title of Project Paper/Research Report/Dissertation/Thesis:

The Impact of Credit Risk Reporting Rules on Financial Analysts' Information Environment.

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Name: DUSAN ANDREJCIK

Date: ______________________________

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We certify that Dusan Andrejcik has worked the equivalent of six semesters on this research, and that the conditions of the relevant ordinance and regulations have been fulfilled.

Signature: __________________________________ Date: _________________

Name: Dr Gurcharan Singh

Signature: __________________________________ Date: _________________

Name: Dr Anwar Halari

Abstract

Majority of the prior research in the area of loan loss accounting has been based on the examination of previous loan loss accounting model – the IAS 39 Incurred loss model, or on the exploration of theoretical implications under the proposed forward-looking model by both International Accounting Standards Board and Financial Accounting Standards Board. This thesis examines the informativeness of the IFRS 9 Expected loss model in the European Union using both primary and secondary data investigations. This research is one of the first studies to investigate informativeness of credit risk reporting under the IFRS 9 Expected loss model implemented by the International Accounting Standards Board in January 2018. Therefore, the area of loan loss accounting under IFRS 9 remains significantly under researched; with majority of studies examining the model descriptively using case studies. Furthermore, the large proportion of existing research evaluate the IFRS 9 Expected loss model through the conceptual lens, by illustrating limitations of the previous model and the improvements implemented within the new model. Given the lack of substantial evidence on the usefulness of the new model for loan loss accounting using large data samples, the current study undertakes the work on this topic to provide a comprehensive clarity in the context of credit risk reporting. As a result, this study arrives at a firm conclusion about the informativeness of the IFRS 9 Expected loss model in the European Union.

For the purpose of this thesis, both primary and secondary data investigations were adopted. Firstly, the accounting data for the sample of 570 EU banks over the period from 2012 to 2016 were analysed to establish whether loan loss provisions determined in accordance with the IAS 39 Incurred loss model or IFRS 9 Expected loss model report

greater ability to predict future credit losses. The secondary data analyses further investigate whether the presence of audit specialist, bank's size and bank's credit rating impact the predictive ability of loan loss provisions. Secondly, 107 survey questionnaires were completed by accounting and finance scholars and practitioners to ascertain their opinions about loan loss accounting in the context of the change implemented by the new forward-looking model – the IFRS 9 Expected loss model. To address these questions number of research methods were adopted.

The results of secondary data analyses document that loan loss provisions determined in accordance with the IFRS 9 Expected loss model have superior predictive ability to estimate future credit losses when compared to the predictive ability of loan loss provisions projected in accordance with the IAS 39 Incurred loss model. Further investigations provide evidence that the predictive ability of loan loss provisions is affected by a bank's credit position; the statistical evidence identifies a positive relationship between institution's credit ranking and its loan loss provisions' predictive ability. However, the bank's size and the presence of audit specialist have no significant impact over the ability of loan loss provisions to estimate future loan losses. Overall, the results suggest that the forward-looking model may exhibit greater informativeness in the context of credit risk reporting.

The results of survey questionnaires suggest that the IFRS 9 Expected loss model provides superior information in terms of accounting prudence and the ability to incorporate expected future events into current loan loss provisions. Furthermore, the most common limitations of the IAS 39 Incurred loss model highlighted by survey respondents related to its limited timeliness and insufficient ability to provide for existing credit losses. Overall, the findings confirm the superiority of IFRS 9 Expected loss model to provide relevant accounting information for credit risk assessment purposes. These findings may have useful implications for future development of accounting standards related to loan loss accounting; accounting standard setters and users of financial statements may seek comprehensive evidence on the usefulness of current standard for credit risk reporting.

Chapter 1 Introduction

1.1 Introduction

The recent global financial crisis 2007-08 (hereafter the crisis) resulted in the failure of numerous commercial and investment banks including several high-profile financial institutions such as Lehman Brothers and Merrill Lynch. The crisis shook the financial markets all over the world and led to a near systemic collapse of the banking sector, followed by an economic contraction unprecedented since the end of the Second World War.

Although there is a general consensus that the primary cause of the crisis was the combination of a credit expansion and a housing bubble[1], some commentators point out the requirement to measure financial instruments on bank's balance sheet at fair value as a point of concern. In this regard, United States (US) Securities and Exchange Commission (SEC) (2008) indicated that fair value accounting (FVA) contributes to financial instability by triggering 'inappropriate' write-downs in the value of assets held by financial institutions; most notably, if such write-downs were the outcome of illiquid or irrational market forces that resulted in figures that did not represent the underlying economics of the asset values. Echoing this view, International Monetary Fund (IMF) (2008a: p. 127) argued that "investment decision rules based on FVA outcomes could lead to self-fulfilling forced sales and failing prices when valuations fell below important thresholds (either self-imposed by financial institutions or regulation)". In other words, based on FVA, asset price changes are reflected immediately on the balance sheets, which

---

[1] Between 2001 and 2003, the US Federal Reserve reduced interest rates from 6.5 per cent to 1 per cent, which together with remiss credit requirements fuelled demand for home ownership. This environment drew in investors that through speculative activity pushed house prices further up (as much as 30 per cent of valuation was supported by market speculation). When the interest rates rose in 2004, it was no longer advantageous to buy houses due to high risk premium, and at the same time, subprime borrowers could no longer honour their payments on adjustable-rate mortgages. This led to massive sell-off of mortgage-backed securities, followed by mass mortgage defaults and foreclosures.

elicit further actions. In addition, in presence of illiquid or irrational markets, artificial volatility compounded in the asset prices hinders decision-making (Plantin, Sapra and Shin, 2008), which then undermines the ability of financial markets to provide timely information to facilitate informed decision-making. It is therefore essential to distinguish the price volatility that solely reflects the fluctuations of the underlying economics of an asset from volatility that cannot be associated with asset's intrinsic value. When asset's fundamental economics are volatile then the market prices do reflect the underlying reality. However, the nature of FVA may lead to 'artificial' volatility which together with short-term price fluctuations and resulting short-term incentives affect the interests of market participants and their actions. "There is then the possibility of a feedback loop where anticipation of short-term price movements will induce market participants to act in such a way as to amplify these price movements" (Plantin, Sapra and Shin, 2008: p. 88). Hence there is a risk of the emergence of an endogenous source of volatility that results merely from the accounting rule – FVA, rather than from the changes in the asset's intrinsic value. Therefore, in order to appreciate the full landscape of the controversy surrounding FVA, it is vital to understand the links and the severity of these causal effects. This phenomenon is best understood by recapping the 2007-08 financial crisis and its implications on financial asset prices.

1.2 The global financial crisis 2007-08

The months of August and September 2008 will forever be recalled as the period when an economic tsunami hit Wall Street. On 7 September, the Federal Housing Finance Agency announced its decision to place two US government-sponsored enterprises, Fannie Mae and Freddie Mac, into conservatorship[2] in order to stabilise the housing and mortgage markets. On 15 September, the global stock markets witnessed extreme instability, with a dramatic fire sale of Merrill Lynch to Bank of America, and more seriously, the bankruptcy of Lehman Brothers, the largest company ever to fail in the US. Since Lehman Brothers played the role of an important counterparty in countless financial transactions around the globe, its collapse predictably led to defaults on many contracts across financial markets. "The collapse of Lehman proved to be a fork in the road – an inauspicious event – that transformed the subprime crisis into a global financial crisis and ushered in the Great Recession" (Sharma, 2014: pp. 1 – 2).

The very next day, on 16 September, the US largest insurer, American International Group, suffered the downgrade of its credit rating, and it became publicly known that it could no longer honour the credit-default swaps it had sold to banks. Fearful of another major failure, the Federal Reserve pumped $85 billion of an emergency credit to ensure its orderly downsizing. Despite the financial support, markets continued to experience uncertainty, and the fast-evaporating confidence led to liquidity problems, sharp declines in equity markets, and soaring interbank rates. On 19 September, the George Bush administration responded to the spiralling financial turmoil by proposing a rescue plan that involved purchasing $700 billion of toxic assets[3] from distressed financial institutions – labelled as Troubled Assets Relief Program (TARP). As the proposal was being made public, the US economic landscape was already experiencing significant structural

---

[2] Goals of the Conservatorships of Fannie Mae and Freddie Mac are to build a more resilient housing finance system that would benefit (1) taxpayers by ensuring that the enterprises should never need another bailout; (2) homeowners, borrowers, and renters by ensuring market stability and supporting mortgage credit availability throughout the business cycle; and (3) investors by supporting US secondary mortgage market resilience (Federal Housing Finance Agency, 2019).

[3] Term 'toxic asset' refers to financial asset, whose value has deteriorated significantly, and for which market no longer functions as a free market, and thus its valuation may not represent its intrinsic worth.

changes which led to the fact that by the end of September 2008, US investment banks had ceased to exist (Lowenstein, 2010). The much-vaunted independent investment banking system enabled by market freedom and individual enterprise came to a humiliating end. Despite TARP being finally approved by the Congress on 30 October 2008, the financial haemorrhaging continued to spread beyond Wall Street. In fact, various efforts by governments across the globe to bring the panic under control by capitalising banks, implementing rescue packages to repurchase toxic assets and providing guarantees on bank deposits and loans, failed to improve the market uncertainty. The world's stock markets lost unprecedented \$2.8 trillion (Bank of England, 2008) during the autumn's market mayhem (see Table 1.1 below) with IMF reporting a decline in economic growth of 6.4 per cent in the fourth quarter of 2008 and 7.4 per cent in the first quarter of 2009 (IMF, 2009a; IMF 2009b).

Table 1.1: Trends in global stock markets.

Index	**May 2008**	**Nov 2008**	**Percentage Decrease (May to Nov 2008)**
Dow Jones Industrial Average (New York)	12,638	8,826	-70
SSE Composite (Shanghai)	3740	1866	-50
Nikkei 225 (Tokyo)	13,803	8,464	-61
FTSE 100 (London)	6,087	4,288	-70
KOSPI (Seoul)	1,852	1,074	-58
S&P TSX 60 (Toronto)	824	533	-65
BSE Sensex 30 (Mumbai)	17,560	9,163	-52

Note: Table 1.1 shows values and percentage decrease of worldwide financial indices before (May 2008) and at the beginning of the crisis (November 2008).
Source: Bloomberg (2018).

It is important to note that most of the excesses unravelled during any financial crisis were built-up during the preceding period of economic expansion. It is therefore essential to identify not only developments during and after the crisis, but more notably developments that took place before the economic downturn. The following section reviews the transformations that shaped the financial sector during the past half-century and led to an environment that encouraged risky behaviour and irrational exuberance. Perhaps nowhere were these symptoms more obvious than in the US housing sector.

1.2.1 The credit market crisis

Loan securitisation began in the US during 1970s, when mortgage loans were pooled together into securities, so called mortgage-backed securities (MBS) by government-backed entities[4]. Generally speaking, the securitisation process involves pooling together various types of bank assets into interest-bearing securities, which are then sold to investors who receive the interest and/or principal payments from the assets. For financial institutions, securitisation represents a useful instrument to transfer the credit risk associated with their assets to another counterparty. In addition, banks benefit from increased ability to lend due to the reduction in the requirement of capital reserves needed to be held against their existing assets[5].

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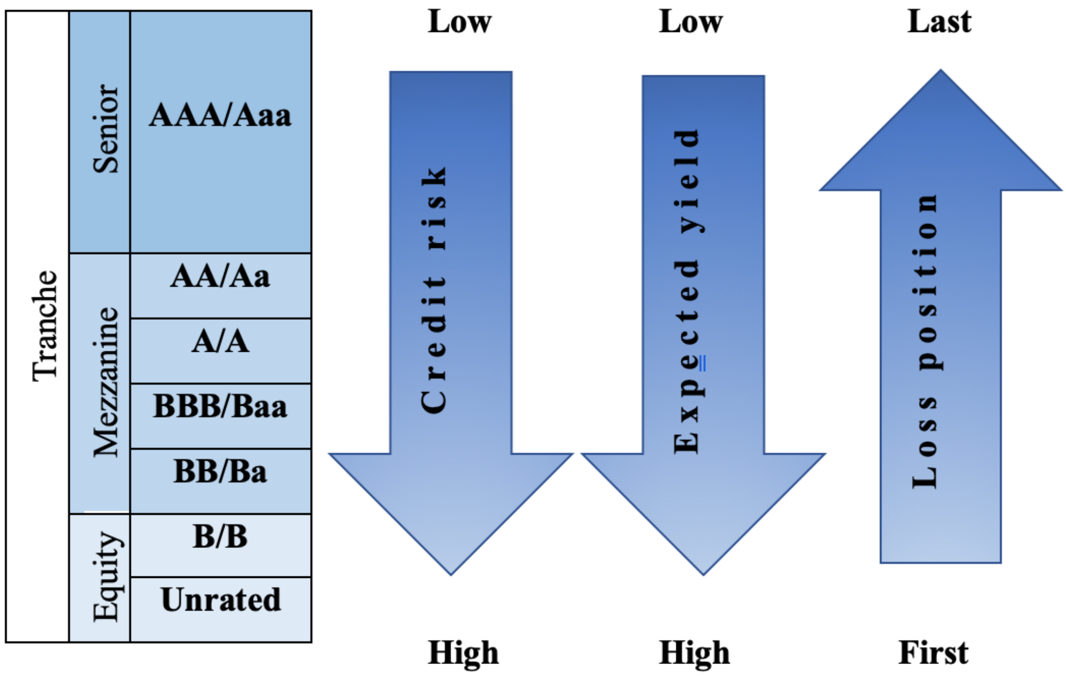
[4] Most MBS contained mortgages guaranteed by the following three agencies: The Government National Mortgage Association (Ginnie Mae), the Federal National Mortgage Association (Fannie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac).

[5] See Kara, Ozkan and Altunbas (2016) that reviews theoretical and empirical literature on the link between bank securitisation and financial system stability. Majority of theoretical research univocally point to the adverse effects of securitisation on banks solvency in form of retention of risky assets, increasing speculative behaviour, and lowering screening and monitoring incentives (Plantin, 2004; DeMarzo, 2005; Gorton and Pennacchi, 1995; Chiesa, 2008; Parlour and Plantin, 2008; Wagner, 2007; Shin, 2009). Empirical research provide evidence that securitisation process contributes to improved banks’ liquidity (Loutskina and Strahan, 2009) and profitability (Cebenoyan and Strahan, 2004), and results in greater loan supply (Loutskina, 2011; Altunbas, Gambacorta and Marqués-Ibáñez, 2009; Goderis *et al.*, 2007).

During 1990s, the securitisation of residential mortgage loans continued to gain widespread popularity and thousands of mortgages were pooled together. Collateralised mortgage obligations were created by combining tranches[6] from different mortgage pools and sold to investors as securities. The tranches were commonly divided into three groups according to their risk/yield characteristics: the senior classes, the mezzanine classes, and the equity class. This subordination structure also explains how potential losses are absorbed, with equity class absorbing losses first, followed by mezzanine classes, and ultimately by senior tranches (see Figure 1.1 below).

Figure 1.1: Subordination structure.



Note: Figure 1.1 shows how potential losses are absorbed using tranches of collateralised mortgage obligations.
Source: Adopted from Krumwiede (2008: p. 317).

[6] Tranches represent portions of debt or securities that are built to diversify risk or other characteristics in a way that is marketable to investors.

In the past, banks typically held onto the entire mortgage loans until they were fully repaid, and thus would have to bear all the losses if a borrower defaulted. It was the primary goal of the banks to ensure that mortgages were issued only to those who could afford to repay a loan. With securitisation, however, banks were allowed to bundle mortgages together into a pool, divide the interest into different tranches and thus spread the risk.

Table 1.2: Issuance of mortgage-backed securities.

Date	**Total MBS (in USD billion)**	**Subprime per cent of total (%)**
2001	1,355	6.4
2002	1,857	6.6
2003	2,717	7.2
2004	1,884	10.2
2005	2,156	21.6
2006	2,050	21.9
2007, Q1	537	16.5
2007, Q2	547	13.7

Note: Table 1.2 shows growth of mortgage-backed securities since 2001 until the second quarter in 2007.
Source: Office of Federal Housing Enterprise Oversight (2007)[7].

Each tranche not only provided different return on investment, but also carried a different level of risk. Some of the lowest equity tranches, with below-investment-grade credit rating, consisted of subprime mortgages that were granted to individuals with poor credit history, including those with inadequate income relative to their debt. These securities

[7] Office of Federal Housing Enterprise Oversight (2007) Portfolio Caps and Conforming Loan Limits, *Mortgage Market Note 07-01,* 6 September 2007, available at: https://www.fhfa.gov/PolicyProgramsResearch/Research/PaperDocuments/20070906_MMNote_07-1_N508.pdf.

often paid more interest and received AAA ratings which gave them the appearance of low-risk high-return investment. These MBS attracted a wide range of investors from insurance companies and sovereign governments to hedge funds and private investors. Between 2001 and 2005, the annual issuance of total MBS increased from $1.36 to $2.05 trillion, and the total MBS consisted of subprime loans increased form 6.4 per cent to 21.9 per cent. By 2008, more than 60 per cent of all US mortgages were securitised (Blanchard, 2009). The data in Table 1.2 above show significant growth of MBS since the beginning of new millennium. The securitisation of subprime mortgages set the stage for the ultimate test of fair value measurement and credit risk reporting rules.

1.3 Fair Value measurement

In their respective accounting standards, the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) define fair value as "the price that would be received upon sale of an asset or paid to transfer a liability in an orderly transaction between knowledgeable market participants at the measurement date" (SFAS 157; IFRS 13). Both accounting standards also prescribe a hierarchy of inputs that can be used in the valuation process into the following three categories: *Level 1* – observable market prices quoted in active markets; *Level 2* – prices for comparable assets or liabilities quoted in active markets; and *Level 3* – unobservable market inputs. It is important to note that absence of market prices, trading activity, or comparable instruments' prices and inputs are prominent characteristics of a complex structured credit products.

In the pre-crisis period, the FASB and the IASB required some assets and liabilities – primarily financial instruments – to be measured at fair value. In essence, both accounting platforms required fair value measurement for financial assets and liabilities held for trading purposes, available-for-sale assets, and all derivative instruments. However, held-to-maturity assets, loans and liabilities were not fair valued and required valuation based on amortised cost. Although the goal of this mixed measurement system was not to prioritise one accounting principle over another, the IMF (2008: p. 107) stated that "uneven application to balance sheets produces accounting volatility and may not fully capture the effects of economic events in all instruments included in the banks' financial statements". While it can be argued that volatility provides relevant information which should be recognised in the reported values, the excessive application of fair value measurement, which relies on valuation inputs from illiquid markets, introduces the risk that the information disclosed will represent artificial volatility. This concern was also voiced by the European Central Bank (ECB) (2004: pp. 7 – 8) which pointed to assets and liabilities held-to-maturity, in which "volatility reflected in the financial statements is artificial and can be ultimately misleading, as any deviations from cost will be gradually compensated for during the life of the financial instrument". This cost could be regarded as a perceived improvement in the intrinsic procyclicality[8] of bank lending – since the expansion of banks' equity during economic booms would support the overextension of credit which would be aggravated in the following economic downturn. In contrast, during economic recession, downward adjustment in asset values would deplete banks' capital and constrain their lending ability.

[8] Procyclicality refers to a situation in which the expansion of banks' assets during economic booms improves banks' perceived ability to provide further credit and raise debt (Gorton and Metrick, 2012; Geanakoplos, 2003). On the other hand, during economic recession, banks' assets can become substantially under-estimated triggering asset fire sales that could weaken regulatory capital and lead to contagion effect spreading across the banking sector (Power, 2010; Laux and Leuz, 2009).

Closely linked to procyclicality is the argument that FVA can provoke contagion in financial markets (Laux and Leuz, 2009). In times of distress and plummeting prices, banks may be forced to sell assets below their fundamental value. This price further becomes relevant to other institutions which are required to mark-to-market their assets. This notion requires the existence of some direct or indirect links to the accounting system, which could trigger the sale of the assets. Allen and Carletti (2008) indicate that regulatory capital requirements calculated using fair value approach can lead to banks' insolvency. Similarly, credit agencies rely on accounting numbers to assess the creditworthiness, and debt covenants are also based accounting inputs when structuring debt contracts.

Another principal drawback of FVA cited in the literature is the potential disruption to market discipline caused by the considerable subjectivity involved in some mark-to-market valuation techniques. Some critics state that fair values do not represent a reality and only are estimates of market prices (Power, 2010; Ronen, 2008). Others go a step further and argue that fair values are essentially 'as-if' or fictional constructs that depend on assumptions of other market participants' assumptions (Bromwich, 2007; Casson and Napier, 1997). Subjectivity criticism concentrates on complex financial operations such as securitisation of assets which has been linked to the subprime crisis and credit crunch (Ryan, 2008). Due to the imbalance between supply and demand during the global financial crisis 2007-08 (GFC), the market prices could be considered abnormal with low relation to its underlying value defined as the potential to generate future cash flows (Véron, 2008).

1.4 Credit risk reporting

Despite the various accusations, existing research does *not* support the view that FVA *per se* has significantly contributed to the crisis both on conceptual and empirical grounds[9]. Instead, several high-profile commentators argue that highly restrictive accounting for credit risk reinforces pro-cyclical tendencies in bank capital regulation and demand accounting standard setters to permit more discretion while determining loan loss provisions (LLP) to reflect credit risk more effectively (BCBS, 2009; Financial Crisis Advisory Group, 2009; Financial Stability Forum, 2009; G20, 2009). Given a direct relationship between LLP and bank's equity (LLP are charged to net income), restriction on LLP charge-offs increases bank's regulatory capital and thus its perceived level of financial stability. The evidence also supports the view that restrictive loan loss accounting and recognition of credit losses contribute to the problems akin to those for which FVA was criticised initially. In other words, restrictive impairment rules prohibit a timely recognition of expected credit losses and thus lead to inflation of asset values, their subsequent fire sales, contagion effect due to negative spill over in distressed financial markets, and distorted market efficiency due to liquidity problems (Gebrahrdt, 2016; Novotny-Farkas, 2016; Camfferman, 2015). A number of research studies have established that delayed or backward-looking loan loss accounting practices contribute to pro-cyclicality of bank lending (Laeven and Majnoni, 2003; Beatty and Liao, 2011; Jiménez *et al.*, 2013). In other words, loan loss accounting which strongly relies on past information inherently results in insufficient provisions since it is unable to provide for potential credit losses expected to occur in the future. This practice is particularly

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[9] See Benston (2008), Ryan (2008), Laux and Leuz (2009), Barth and Landsman (2010), Badertscher, Burks and Easton (2012) for the empirical evidence about the role of FVA during GFC. For conceptual discussion about the significance and origin of FVA see Véron (2008), Power (2010), Bhimani (2008) and Gwilliam and Jackson (2008).

problematic at the peak of economic upturn when loan loss provisions are excessively insufficient and thus low. The resulting banks' limited reserves at the time could therefore be rapidly depleted once the recession hits. It is thus of primary concern to design loan loss accounting rules which would lead to sufficient reserves in the event of credit default, and at the same time, minimise the negative externalities associated with management opportunistic behaviour.

1.4.1 Loan loss provisioning

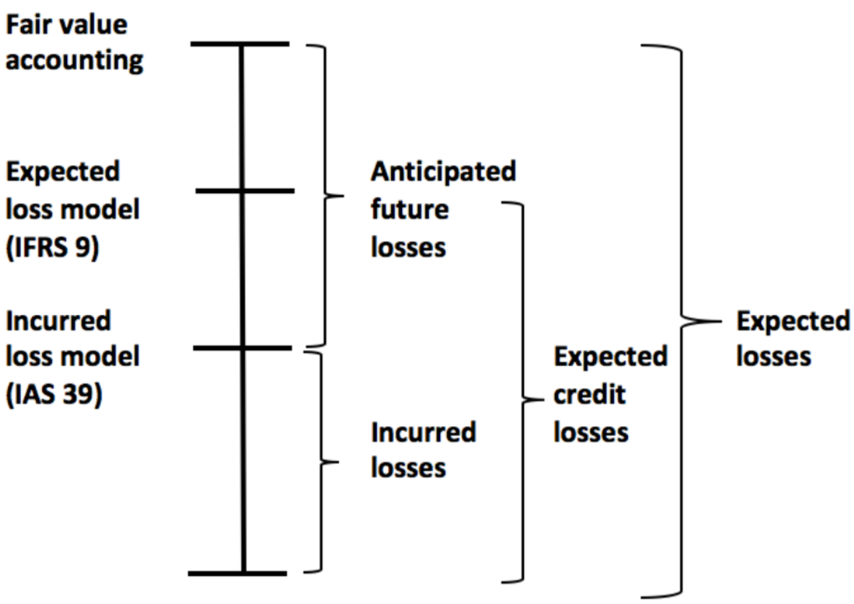
Loan loss provisioning represents an accounting tool that allows banks to set aside allowances for potential loan losses in the future. It reflects banks' financial stability since it affects banks' capital positions, profitability and further economy's overall credit supply (Beatty and Liao, 2009). In principle, loan loss provisioning should reflect the quality of banks' financial asset portfolio and be able to provide sufficient reserves to absorb potential losses if they were to arise.

The economic value of a loan, which unquestionably provides the most relevant information to the users of financial reports, is defined as the present value of all the expected cash flows from the borrowing party. When the loan is initially recorded, there is no requirement to set-up LLP since the contractual interest rate covers all expected losses over the life of a loan. However, with the changes in interest rates and borrower's probability of default, the economic value of the loan changes and the expected losses can be estimated as follows:

$$ExL_t = \sum_{t=q}^{N} \frac{PD_t L_t}{(1+r)^t}$$

where ExL_t are the expected losses; PD_t is the borrower's cumulative probability of default; L_t is the loss in the event of default; and r is the discount rate used to discount expected cash flows. All variables are updated at the time t. While this formula appears rather straight-forward, the expected losses considerably vary across different loan loss accounting systems, as depicted in Figure 1.2 below.

Figure 1.2: Loan loss recognition under alternative loan loss accounting systems.



Note: Figure 1.2 shows variability in recognition of expected credit losses with respect to three loan loss accounting systems (IAS 39 Incurred loss model; IFRS Expected loss model; and Fair value accounting model).
Source: Adapted from Novotny-Farkas (2016: p. 199).

Figure 1.2 above shows that FVA represents the most comprehensive impairment model since it includes all risk factors and provides premium for both expected and unexpected risks. The two impairment models (IAS 39 Incurred loss model and IFRS 9 Expected loss model) differ to the extent to which they incorporate various risk factors, such as interest rates, foreign exchange risk, credit risk, and whether they provide for expected and/or unexpected risks. Since the IAS 39 and IFRS 9 impairment models only provide for credit losses, they ignore the risks emerging from other risk factors such as interest rate risk, foreign exchange risk and/or liquidity risk. In addition, these two impairment models are restricted to expected losses only, and thus do not consider the possibility of unexpected credit losses.

There are three important design aspects which define different loan loss provisioning models, namely (i) relative weight of recoverable amount and loss event criteria; (ii) basis for computing effective interest rate; and (iii) level of collective provisioning. The implementation of a recoverable amount criterion asserts that carrying amounts of loans do not exceed the present value of all expected cash flows in a form of interest and principal payment. An emphasis on this criterion when designing a model for loan loss provisioning suggests a forward-looking approach, in which expected (not contractual) cash flows are the primary source of information for determination of expected credit losses. On the opposite side of the continuum is placed a loss event criterion which highlights clear evidence of impairment which acts as a pre-requisite before the loss is recognised. When the loss event criterion is applied, it only reinforces a recoverable amount principle, in other words, when estimating future cash flows to determine a recoverable amount, only credit losses arising from events with objective evidence are allowed to be recognised.

The second design element of loan loss provisioning is the issue of whether expected credit losses are to be considered when recognising interest income through calculation of the effective interest rate. If expected credit losses are not taken into account, and thus the future cash flows are equal to the contractual cash flows, the effective interest rate and periodic interest income will be greater in comparison with the effective interest rate computed based on the expected cash flows (cash flows that consider expected losses)[10].

The third element concerns whether to allow or require assessment of impairment at the portfolio level and how it should inform the individual impartment assessment. This aspect of loan loss provisioning is entrenched in the notion that while there may be no indication of impairment when financial assets are assessed individually, it may be reasonable to consider impairment losses for groups of similar financial assets. In other words, banks may know using past data that there is a reasonable probability that a portion of their loans will default, however, is unable to predict a risk of default on an individual basis. In response, banks typically increase their rates of interest to offset the losses on some of the loans. The other option is to incorporate generalised loss expectations when computing the effective interest rates for individual loans through the adjustment to expected cash flows. In addition, banks can apply the loss event criterion at the portfolio level – "even when insufficient information about loss events is available for individual loans, it may be possible to make reliable estimates of the occurrence of such events for the portfolio as a whole" (Camfferman, 2015: p. 5).

1.4.1.1 Incurred loan loss model (IAS 39)

During the crisis, LLP were governed by the International Accounting Standard (IAS) 39 and Financial Accounting Series 326 under IASB and US FASB respectively, which prescribed an *incurred loss model* to determine LLP. The incurred loss model requires

[10] Another issue that has also been discussed amongst the accounting standard setters is whether market rates of interest are to be considered in calculating the impairment losses. This issue would however move measurement of losses out of the historical cost notion into fair value accounting, which has been rejected by the accounting standard setters (Camfferman, 2015).

provisions to be set only once a loss has been *incurred*; that is banks can only provide for a credit risk when there is an objective evidence that impairment has occurred as of balance sheet date:

> *"A financial asset or a group of financial assets is impaired and impairment losses are incurred if, and only if, there is objective evidence of impairment as a result of one or more events that occurred after the initial recognition of the asset (a 'loss event') and that loss event (or events) has an impact on the estimated future cash flows of the financial asset or group of financial assets that can be reliably estimated" (IAS 39.59).*

Therefore, such requirement restricts provisioning to losses that are considered as probable as of the balance sheet date, and strictly rejects expected credit losses from events anticipated to occur after the balance sheet date: "Losses expected as a result of future events, no matter how likely, are not recognised" (IAS 39.59). Although limiting the recognition of expected loss events has been justified on the grounds of reduction of negative opportunities to engage in earnings management, Agénor and Zilberman (2015: pp. 301 – 302) argue that "IAS 39 accounting guidelines have been a predominant source of procyclicality in lending standards, because loan loss provisions tend to be essentially ex post". Since the loan loss recognition is delayed until the borrower actually defaults, it precludes banks from provisioning appropriately for potential credit losses. This can further hinder a timely action by both bank management and supervisory authorities (BIS, 2011). In addition, IAS 39.59 outlines a tentative list of trigger events that could indicate an impairment, for example:

(i) "significant financial difficulty of the issuer or obligor";
(ii) "a breach of contract, such as a default or delinquency in interest or principal payments";
(iii) "the lender, for economic or legal reasons relating to the borrower's financial difficulty, granting to the borrower a concession that the lender would not otherwise consider";
(iv) "it becoming probable that the borrower will enter bankruptcy or other financial reorganisation";

(v) *"the disappearance of an active market for that financial asset because of financial difficulties".*

The measurement of impairment further depends on the category of a financial asset to which the asset is classified[11]. For assets measured at amortised cost (held-to-maturity investments and loans and receivables), IAS 39.63 states that "the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the financial asset's original effective interest rate". It is therefore evident that management discretion must be exercised when estimating future cash flows. Discounting estimated future cash flows at balance sheet date using the rate as of initial recognition results in value that is not only difficult to interpret but may also be questionable in terms of its reliability (Gebhardt, 2016). For assets measured at fair value through profit or loss (available-for-sale assets and financial assets at fair value through profit or loss), the amount of impairment is "the difference between the acquisition costs and current fair value" (IAS 39.68). It is important to mention that this recognition of losses does not incorporate expected credit losses and the effects from changes in factors such as interest rate risk. Therefore, only impairments as a result of events prior to the balance sheet date can be recognised.

Another important feature of the incurred loss model is the revenue versus expense recognition of interest payments. According to *IAS 18 Revenue*, interest payments charged by creditors are recognised upfront when:

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[11] For measurement purposes, IAS 39 classifies financial assets into four categories: (i) financial assets at fair value though profit or loss; (ii) held-to-maturity investments; (iii) loans and receivables; and (iv) available-for-sale financial assets.

(i) *"it is probable that the economic benefits associated with the transaction will flow to the entity; and*
(ii) *the amount of the revenue can be measured reliably."*

On the other hand, interest expense recognition for credit losses is delayed until the actual loss occurs. Therefore, the recognition gap between interest revenues and interest expense may encourage management to extend credit to risky borrowers with view of increasing short-term earnings via early recognition of interest income.

1.4.1.2 Expected loan loss model (IFRS 9)

While the incurred loss model was ingrained in the thinking of standard setters, the concerns raised led to a re-examination of links between loan loss accounting rules and procyclicality. Financial Stability Forum (FSF) recommended the development of a 'new' accounting model for loan losses to enhance overall transparency:

> *"Earlier recognition of loan losses could have dampened cyclical moves in the current crisis. Earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness" (FSF, 2009).*

The issues over the delay of credit loss recognition and under-provision for loan loss allowances became a central justification for calls to modify the impairment requirements among the major accounting standard setters. In 2011, the IASB and FASB published a joint proposal that introduced an *expected loss model* for accounting of LLP. Although there are some differences in the approach to expected loss provisioning in their respective standards[12], the IASB and FASB highlight the model that is based on an impairment framework considering expected losses. This approach considerably widens

[12] The expected loss model is currently prescribed by IFRS 9 and ASU 2016 published by the IASB and FASB respectively.

the amount of information a reporting entity can incorporate into determination of LLP. In particular, the expected loss model entails implementation of information from past events, current conditions, and reasonable and supportable forecasts in their estimation of expected credit losses (IFRS 9.5.517). Importantly, the expected loss model does not include the requirement of the existence of objective evidence of a 'loss event' criterion for recognising impairment, and thus, integrates a significantly larger set of information relevant for identification of expected credit losses which results in earlier recognition of expected credit losses. Consequently, under IFRS 9 Expected loss model, it would no longer be required for a credit event to have occurred before losses are recognised. Instead, expected credit losses and changes in expectations of these losses are recognised in each reporting period to reflect deviations in credit quality.

IFRS 9 defines expected credit losses (ECL) as "the weighted average of credit losses (CL) with respective risks of a default occurring as the weights (RDO)" (p. A371):

$$ECL = RDO \times CL$$

A credit loss represents a difference between the cash flows that are due to a bank in accordance with the contractual agreement and the cash flows that bank expects to receive discounted by the original effective interest rate. Since expected credit losses factor in the amount and timing of payments, credit losses could arise despite receiving the payments in full but later than initially agreed in the contract. IFRS 9 outlines a three-stage model to determine the impairment based on asset's credit risk since its initial recognition (see Figure 1.3 below).

Figure 1.3: Three-stage impairment model for financial assets under IFRS 9.

Change in credit quality since initial recognition

Recognition of expected credit losses		
12-month expected credit losses	**Lifetime expected credit losses**	**Lifetime expected credit losses**
Interest Revenue		
Effective interest on gross carrying amount	Effective interest on gross carrying amount	Effective interest on amortised cost carrying amount
Stage 1	**Stage 2**	**Stage 3**
Performing	*Underperforming*	*Non-performing*

Note: Figure 1.3 summarises the IFRS 9 impairment model with regards to the three stages of impairment.
Source: Adapted from Gebhardt (2016: p. 174).

According to IFRS 9, the stages of interest revenue and expected credit losses recognition are corresponding, which is in stark contrast with IAS 39 where a delay between interest revenue and interest expense exists (see Section 1.4.1.1). Initially, all performing financial instruments are placed in Stage 1 "that have not had a significant increase in credit risk since initial recognition or that have low credit risk at the reporting date" (PwC, 2014: p. 2). IFRS 9 has been criticised over the lack of key definitions, such as delineation of default:

> *"[…] an entity shall apply a default definition that is consistent with the definition used for internal credit risk management purposes for the relevant financial instrument and consider qualitative indicators (for example, financial covenants) when appropriate. However, there is a rebuttable presumption that default does not occur later than when a financial asset is 90 days past due unless an entity has reasonable and supportable information*

> *to demonstrate that a more lagging default criterion is more appropriate" (IFRS 9.B5.5.37).*

As seen above, definition of default is dependent on internal guidelines, which could lead to inconsistencies among the reporting practices across different entities. For financial instruments at Stage 1, a reporting entity should recognise 12-month expected credit losses and interest revenue is computed based on gross carrying amount, which does not include deduction of credit allowance. The expected 12-month credit losses represent all the losses as a result of default eventualities that could occur over the period of 12 months after the balance sheet date. In other words, the losses are not deficits of expected cash over the 12-month period but the entire amount of losses on financial instruments weighted by the probability of such default occurring in the next 12 months.

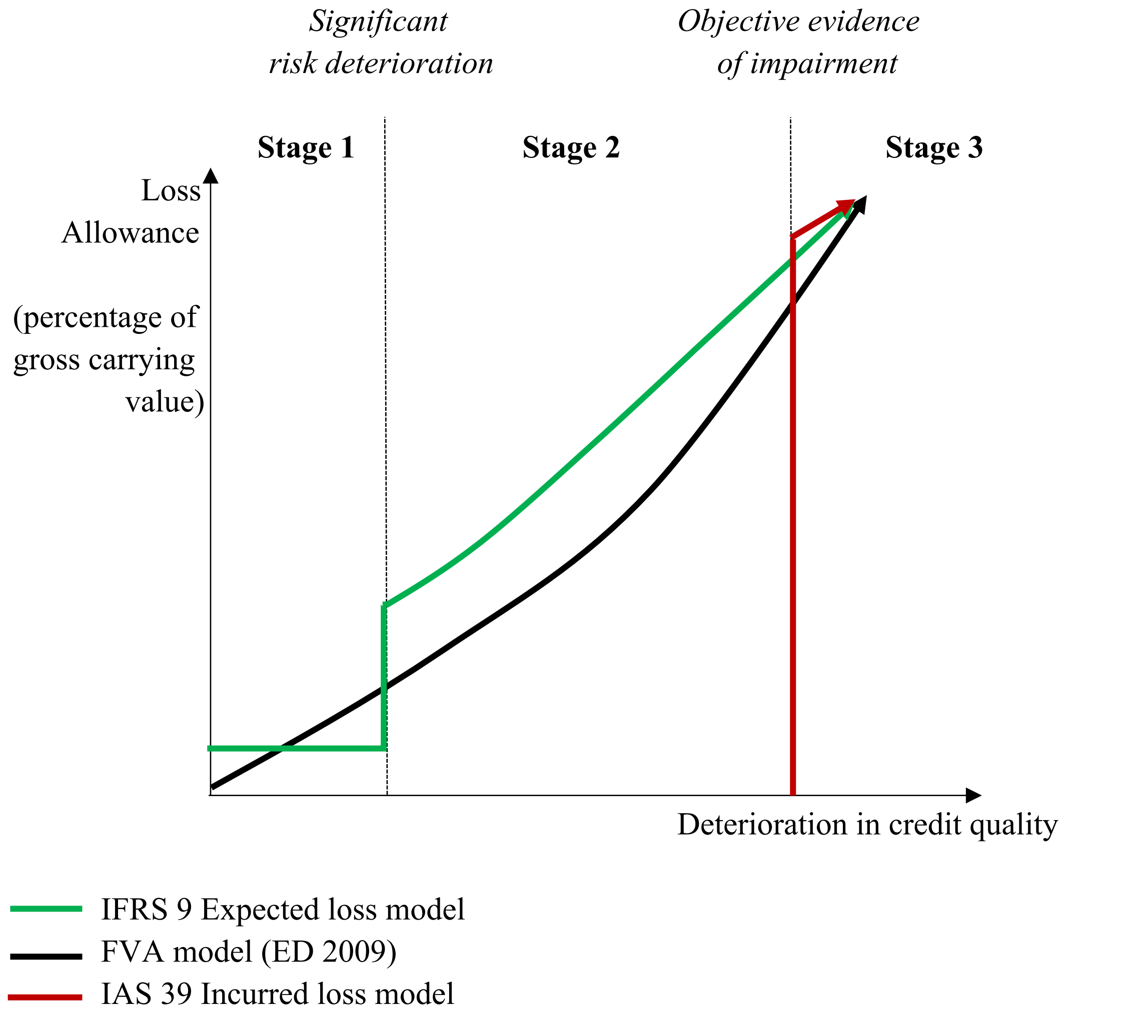
Financial instruments remain at Stage 1 until their credit risk significantly increases since the initial recognition. It is important to mention that while such assets may have a significant increase in credit risk, there is still no objective evidence of impairment. Again, IFRS 9 does not provide a comprehensive definition of a significant increase in credit risk, which makes the move from Stage 1 into Stage 2 problematic (Gebhardt, 2016).

> *"Regardless of the way in which an entity assesses significant increases in credit risk, there is a rebuttable presumption that the credit risk on a financial asset has increased significantly since initial recognition when contractual payments are more than 30 days past due. An entity can rebut this presumption if the entity has reasonable and supportable information that is available without undue cost or effort, that demonstrates that the credit risk has not increased significantly since initial recognition even though the contractual payments are more than 30 days past due" (IFRS 9.5.5.11).*

The above citation from IFRS 9 outlines that management should rely on 30 days threshold when assessing significant increase in credit risk. However, it is evident that reporting entities have an option not to place financial instruments into Stage 2 despite contractual payment being overdue 30 days if reasonable information exists to support such conduct. For all financial assets at Stage 2, lifetime expected credit losses are recognised and, exactly as at Stage 1, interest revenue is calculated based upon a gross carrying amount. The lifetime expected credit losses represent all losses as a result of default events that might occur until financial asset matures, weighted by the probability of such events occurring during the asset's lifetime.

Once there is an objective evidence of impairment, financial assets are placed into Stage 3. As in the case of Stage 2, for Stage 3 financial assets lifetime expected credit losses are recognised and interest revenue is computed on the amortised cost carrying amount, which is the gross amount less credit allowances.

Figure 1.4: Credit losses recognition under IFRS 9 Expected loss model, FVA model (ED 2009) and IAS 39 Incurred loss model.



Note: Figure 1.4 illustrates the recognition of loss allowance under the three impairment models (IFRS 9 Expected loss model; FVA model; and IAS 39 Incurred loss model). Source: Adapted from Novotny-Farkas (2016: p. 201).

Figure 1.4 above shows the recognition of expected credit losses across the three different approaches in credit risk reporting: (i) FVA approach or so-called economic expected credit loss model; (ii) IFRS 9 Expected loss model; and (iii) IAS 39 Incurred loss model. By observing Figure 1.4 above, it becomes evident that the IFRS 9 Expected loss model can be regarded as a combination of the incurred loss model and FVA model as it provides for expected credit losses, however, it does ignore changes in market interest rate, the component of mark-to-market or FVA accounting. The economic expected credit loss model has been initially proposed by IASB as part of the IASB Exposure Draft ED/2009/12 *Financial Instruments: Amortised Cost and Impairment* (ED 2009). In ED 2009, lifetime expected credit losses are recognised from initiation using integrated effective interest rate:

> *"Initially expected credit losses would therefore be allocated over the expected life of assets, thereby avoiding both the overstatement of interest revenue in periods before loss events occur (IASB, 2009, paragraph BC11) and the unduly early recognition in income of these initially expected losses" (O'Hanlon, 2018: p. 4).*

Represented by a solid black line in Figure 1.4 above, at initial recognition of financial asset, the expected credit losses are nil under the FVA model since the effective interest rate is equal to the contractual interest rate charged on a debt instrument. Subsequently, the expected credit losses are built reflecting the changes in the credit quality of a financial asset. This approach is considered as the most reliable approximation of loan economic value[13], which however was not implemented by IASB on the basis of operationally too challenging. The solid green line represents the IFRS 9 Expected loss model that is characterised by a three-stage profile as compared to rather continuous profile under FVA model. The IFRS 9 model initially provides more for expected credit losses in comparison to FVA model, however, as credit quality deteriorates, it underprovides in terms of loan loss allowances before it moves into Stage 2. Once there is a significant increase in credit risk, IFRS 9 again overprovides for expected losses when compared to the FVA model. The solid red line in Figure 1.4 above represents the IAS 39 Incurred loss model that only allows loss allowances to be recognised once there is an objective evidence of

[13] Novotny-Farkas (2016) highlights that FVA does not factor in changes in market interest rates.

impairment. Therefore, it corresponds to non-provisioning for expected credit losses at Stage 1 and Stage 2 in the IFRS 9 Expected loss model.

There are also some practicality issues associated with the IFRS 9 Expected loss model. More specifically, an entity is required to recognise at each reporting date (including day-one[14]) 12-month expected credit losses. This feature has been widely debated amongst the standard setters with FASB raising a concern on conceptual grounds:

> *"the bad-debt expense that is recorded on day-one is inconsistent with the definition of an expense […]. [T]he incremental loss that would be recognised […] is not based on the economics of the transaction but rather on a prudential desire to have a higher level of loan loss reserves reflected in financial reports to investors" (O'Hanlon, 2018: p. 10).*

Similarly, the IASB expressed concerns by stating: "[t]hey are unaware of any other area of financial reporting for which loss and a related valuation allowance are immediately established to reduce the value of a recognised asset that is purchased or originated on market terms" (IASB 2013). Despite these arguments, day-one-loss was implemented within the IFRS 9 Expected loss model.

1.5 Research questions and objectives of the study

The global financial crisis has led to a debate about the effectiveness of general-purpose financial reporting and macro-prudential regulation in the context of financial stability objectives[15]. A key issue here is to design accounting treatments and macro-prudential

[14] Day-one refers to the entity's first reporting date after the origination or purchase of a financial asset.

[15] General-purpose financial reporting aims to provide information to those outside the business entity in order to support wide range of decision-making contexts and contractual arrangements. In contrast, the aim of macroprudential regulation is to protect financial system by certain requirements, restrictions and guidelines designed to create market transparency between financial institutions and the entities with whom they conduct a business.

measures that help to reduce the procyclicality of the financial system, which is, excessive swings of financial variables around the economic cycle that consequently distort investment decisions (Agénor, 2015). Much of the emerging literature focuses on the macro-prudential aspect when examining the policy options to promote financial stability, with capital buffers attracting the most attention[16]. In terms of financial reporting, loan loss provisions have been stated as a countercyclical accounting treatment that has the ability to mitigate exacerbation of inherent cyclicality in bank lending (Agénor, 2015).

The focus of this thesis is on the link between the general-purpose financial reporting (not macro-prudential regulation) and the stability of the financial sector represented by commercial and investment banks. More precisely, this study intends to examine and explore the consequences of changing loan loss accounting system from the IAS 39 Incurred loss model to the IFRS 9 Expected loss model on the informativeness of credit risk reporting rules for general-purpose financial reporting.

Therefore, the aim to this thesis is to examine the view that more forward-looking provisioning rules mitigate procyclicality in bank lending and thereby enhances stability of the financial system (BCBS, 2009; Financial Crisis Advisory Group, 2009; Financial Stability Forum, 2009; G20, 2009). In line with the aim of this thesis, Sections 1.5.1 to 1.5.4 outline the four objectives of this study.

[16] Studies like VanHoose (2008), Santos (2001), Stolz (2002), Bliss and Kaufman (2003) examine macroeconomic and monetary policy implications of the Basel systems of risk-based capital requirements.

1.5.1 First research question and objective

The first objective of this study is ***to investigate which loan loss accounting model (IAS 39 Incurred loss model or IFRS 9 Expected loss model) has superior predictive ability to estimate actual loan losses.***

Financial accounting information plays an important corporate-governance role, enhancing monitoring function by boards of directors, outside investors and regulators (Bushman and Smith, 2001). The banking literature posit that loan losses play a fundamental role in equity valuation since they directly impact the volatility and cyclicality of banks' earnings and the informativeness of banks' financial statements with regards to loan portfolio's risk characteristics (Bushman and Williams, 2012). Therefore, LLP can be used to reduce information asymmetries between better informed managers and less informed users of financial statements (investors, regulators or others). The application of IFRS 9 Expected loss model is highly dependent on management judgment, which involves significant discretion during the process of estimation, measurement and timing of loan loss allowances. Therefore, managers may exhibit competing incentives in a way they exercise their judgment. A purported benefit of increased discretion in the accounting standards is that it allows managers to convey private information to the financial statement users (Marton and Runesson, 2017). On the other hand, it also enables managers to use it opportunistically to engage in earnings, capital and/or tax management (Ball, 2006).

While early evidence suggests that there is a relationship between equity market values/returns and the level of loan loss allowances (Elliot, Hanna and Shaw, 1991; Griffin and Wallach, 1991; Beaver *et al.*, 1989), it does not control for the level of discretion. Subsequent studies show that discretion plays an important role in the informativeness of LLP. Liu and Ryan (1995) finds that timeliness of LLP diminishes with increasing discretion, and Beaver and Engel (1996) provides evidence that equity values are only positively associated with discretionary LLP. According to the signalling hypothesis, the findings support the notion that LLPs are used “to signal that banks have the intention and ability to deal with bad loans” (Beatty and Liao, 2014: p. 355). More recently, Gebhardt and Novotny-Farkas (2011) provide evidence that while the incurred loss model is associated with significantly less income smoothing behaviour, it is less timely to provide for loan losses relative to the expected loss model. While more restrictive incurred loss model reduces discretionary behaviour, which suggests better transparency in financial reporting, less timely LLP recognition also indicates that financial statements become less informative, thereby reducing the quality of accounting information available for financial statement users. Given that the application of IFRS 9 Expected loss model entails greater use of discretion relative to IAS 39, it is hypothesised that:

H1: *The predictive ability of loan loss provisions to estimate actual loan losses is greater for provisions estimated using IFRS 9 Expected loss model relative to IAS 39 Incurred loss model.*

Therefore, the first research question of this thesis is stated as follows:
Do loan loss provisions determined in accordance with IFRS 9 Expected loss model predict actual loan losses superiorly when compared to loan loss provisions determined in accordance with IAS 39 Incurred loss model?

1.5.2 Second research question and objective

The second objective of this study is ***to investigate the effect of auditor specialisation on the predictive ability of loan loss provisions to estimate actual loan losses.***

Academic research indicates that accounting quality is not principally determined by the accounting standards (Burgstahler, Hail and Leuz, 2006; Ball and Shivakumar, 2005; Leuz, Nanda and Wysocki, 2003; Ball, Kothari and Robin, 2000), and it is largely affected by various internal and external forces shaping the overall quality of financial information. In other words, the existing literature documents that the quality of accounting information is determined by firm's reporting incentives (Daske *et al.*, 2008), level of enforcement (Christensen, Hail and Leuz 2013; Barth and Israeli, 2013; Brown, Preiato and Tarca, 2014), investor protection (Fonseca and González, 2008; Leuz, Nanda and Wysocki, 2003; La Porta, Lopez-de-Silanes and Shleifer, 2002), regulation and supervision (Claessens and Laeven, 2004; Beatty, Chamberlain and Magliolo, 1995; Shrieves and Dahl, 2003) amongst other.

Therefore, in the banking sector where the information asymmetry is significantly greater relative to the industrial sector due to complex nature of banking operations, the importance of auditor expertise in ensuring integrity and relevance of financial statements becomes ever more vital. According to a US General Accounting Office report (1991), independent auditing can enhance the faithfulness of financial statements by ensuring banks are honest in their financial reporting practices, thereby lessening the public's uncertainty about the banks' financial stability. Furthermore, an auditor expertise represents a significant element to audit quality, which can further reduce "information asymmetry through their greater ability to detect material misstatements and constrain management's discretionary behaviour" (DeBoskey and Jiang, 2012: p. 613).

While auditors do perform the auditing practice using similar methods, it is noteworthy to mention that some auditors focus on a particular industry and ensure that they attain strong industry-specific knowledge and experience. This is achieved, in particular, via extensive and specialised staff training and investment in relevant information technology. Maletta and Wright (1996) provide evidence that auditor specialisation enhances audit quality by reducing audit error and misstatements. They also suggest that specialised auditors are more forthcoming with their findings since they value their reputation strongly over the clients' interests. Various other studies find that firms audited by those with industry-specific reputation have lower incidence of earnings management and superior accounting informativeness (Wahlen, 1994; Greenwalt and Sinkey, 1988; and Liu and Ryan, 2006). In line with the hypothesis of reduction of information asymmetries between financial statement preparers and users, Kanagaretnam, Krishnan and Lobo (2009) find evidence that banks audited by industry specialists receive higher valuation of discretionary element of loan loss provisions, which further improve the signalling function of discretionary loan loss provisions. The subsequent study by Kanagaretnam, Lim and Lobo (2010) also suggest that earnings management is constrained in banks with auditor industry specialisation.

In the case of the banking industry, banks as reporting entities are subject to the scrutiny of various stakeholder groups. In addition to the general-purpose financial reporting objective to serve groups such as investors, creditors and shareholders, banks are equally required to comply with relevant macro-prudential regulations to safeguard financial stability objective. Given that the purpose of this study is to investigate the link between the general-purpose financial reporting and banks' financial stability, the focus is on the group of users of financial statements, primarily financial analysts and investors. These are increasingly interested in information about banks' earnings quality, which, according to the prior evidence, is predicted to be enhanced by the presence of an audit specialist. Therefore, the following hypothesis is stated:

H2: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks whose auditor is an industry specialist than in those banks whose auditor is not an industry specialist.*

Therefore, the second research question of this thesis is stated as follows:
Do loan loss provisions audited by industry specialist provide greater predictive ability to estimate actual loan losses in comparison to loan loss provisions audited by non-industry specialist?

1.5.3 Third research question and objective

The third objective of this study is ***to investigate the effect of reporting incentives on the predictive ability of loan loss provisions to estimate actual loan losses***.

In relation to banks' reporting incentives, the size of a financial institution has been found to affect the compliance with accounting standards. The key reason is the existence of political cost hypothesis which suggests that companies subjected to potential wealth transfers in the form of taxes, regulations or other political costs would make accounting choices that result in reduction of such transfers (Watts and Zimmerman, 1986). While

EU listed banks do not have choice over the loan loss accounting model as unlisted entities do[17], there is still an opportunity for all banks to apply certain amount of discretion using each model. A number of studies have documented that companies appear to manage discretionary accruals (loan loss provisions included), in particular during the times of increased political costs (Jones, 1991; Cahan, 1992; Han and Wang; 1998; Key, 1997). This suggests that despite heightened political scrutiny, reporting entities do apply certain level of discretion into their accounting estimates. This level of discretion is impacted by a loan loss accounting model, and thus the effect of reporting incentives on accounting variables would be more pronounced under higher-judgement accounting option (IFRS 9 Expected loss model) than under lower-judgment choice (IAS 39 Incurred loss model).

Banks are inherently exposed to the political costs that are positively associated with bank's size. There are at least two aspects distinguishing large banks from small banks. First, since large banks are exposed to greater monitoring and scrutiny from capital markets, it is expected that they would comply with the accounting standards on the greater scale relative to smaller banks (see Beck and Narayanamoorthy, 2013; Grace and Leverty, 2010 for evidence). This line of argument emerges from the political cost hypothesis originally proposed by Watts and Zimmerman (1978) stating that a management in charge of company subjected to potential wealth transfers associated with regulatory process, would make accounting choices that diminish these transfers.

> *"[...] managers have greater incentives to choose accounting standards which report lower earnings due to tax, political, and regulatory*

[17] The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.

> *considerations than to choose accounting standards which report higher earnings and, thereby, increase their incentive compensation. However, this prediction is conditional upon the firm being regulated or subject to political pressure. In small, unregulated firms, we would expect that managers do have incentives to select accounting standards which report higher earnings, if the expected gain in incentive compensation is greater than the forgone expected tax consequences" (Watts and Zimmerman, 1978: p. 118).*

In addition, Laeven, Ratnovski and Tong (2014) provide evidence that large banks, on average, create more individual and systemic risk than their smaller counterparts. This is particularly high when banks have insufficient capital and engage in increased risk-taking investments or are organisationally complex. Taken together, Laeven, Ratnovski and Tong (2014) conclude that heightened creation of systemic risk is partly driven by the notion of too-big-to-fail and empire-building incentives.

Second, it is less costly for larger banks to have internal expertise and advanced systems for estimation of credit losses than for smaller banks. In relation to loan loss accounting, relevant data, internal knowledge and advanced technology systems are vital for entities applying IFRS 9 Expected loss model. For example, an assessment of significant increase in credit risk should incorporate all relevant, reasonable and supportable information, both in quantitative and qualitative form. The model specifically highlights the use of qualitative judgment of an entity's credit officer in support of statistical models or credit ratings processes. Therefore, it is predicted that larger banks estimate loan loss provisions with stronger ability to predict actual loans losses than smaller banks, and the size effect is more pronounced in banks applying IFRS 9 Expected loss model since it allows more discretion. Thus, the following hypothesis is stated:

H3: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in larger banks than in smaller banks, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

Therefore, the second research question of this thesis is stated as follows:
Do loan loss provisions reported by larger banks provide greater predictive ability to estimate actual loan losses in comparison to loan loss provisions reported by smaller banks?

Is the size effect more significant in banks reporting loan loss provisions in accordance with IFRS 9 Expected loss model when compared to banks reporting loan loss provisions in accordance with IAS 39 Incurred loss model?

1.5.4 Fourth research question and objective

The fourth objective of this study is ***to investigate the effect of bank's credit rating on the predictive ability of loan loss provisions to estimate actual loan losses.***

Loan loss accounting is the first line of defence against credit risk in banking. The purpose of loan loss accounting is to ensure that banks have sufficient reserves to cover potential future loan losses. It is important that these reserves or loan loss allowances are neither excessive nor insufficient since their role is to represent the level of credit risk a bank is exposed to, given its loan portfolio and the ability to handle any future loan default. Thus, one can argue that loan loss accounting is the bank's current and future credit standing. In other words, if a bank's credit position improves (worsens) substantially, loan loss provisions can be decreased (increased) to reflect its credit position. The research has provided conclusive evidence that loan loss provisions are pro-cyclical, that is, loan loss provisions decrease during expansionary periods of business cycle and increase during economic recessions (Bikker and Metzemakers 2005; Bouvatier and Lepetit 2008; Laeven and Majnoni 2003). Curcio *et al.* (2014) find that pro-cyclical tendency is associated with a discretionary portion of loan loss provisions[18] in particular, and Beuvatier and Lepetit (2008) find evidence that non-discretionary loan loss provisions lead to greater credit fluctuations. In conclusion, it is evident that loan loss provisions are pro-cyclical, meaning that provisioning is positively related to the business cycle fluctuations. In addition, further research suggests that another contributing factor to procyclicality in the banking sector is that market participants behave as if risk is countercyclical, that is, at its highest during recessions (Amato and Furfine, 2004). For example, banking regulations tend to be more rigorous during recessions (Syron, 1991), and bank loan standards often deteriorate during economic expansions (Lown, Morgan and Rohatgi, 2000). This could explain why loan loss provisioning is at its peak during economic downturns.

Given that banks receive more superior credit ratings during economic upturns, and more inferior credit ratings during economic downturns (Jacobson and Lindé, 2000), loan loss provisions would decrease when banks enjoy high credit rating (proxy for economic upturn), and loan loss provisions would increase when banks hold lower credit rating (proxy for economic downturn). This loan loss provisioning increase (decrease) during economic downturn (upturn) has negative (positive) impact on bank's operating income.

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[18] Loan loss provisions can be distinguished between discretionary and non-discretionary loan loss provisions. Non-discretionary portion of loan loss provisions is represented by expected credit losses, whereas discretionary involves internal judgment and is often associated with income smoothing, earnings and capital management and signaling hypothesis.

This relationship has implications on the ability of loan loss provisions to predict actual loan losses since banks are expected to be more rigorous when they receive a lower credit rating. Thus, it is expected that banks with higher credit rating estimate loan loss provisions with greater predictive ability than banks with lower credit rating. Therefore, the following hypothesis is stipulated:

H4: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks with higher credit rating than in banks with lower credit rating, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

Therefore, the fourth research question of this thesis is stated as follows:
Do loan loss provisions reported by banks with higher credit rating provide greater predictive ability to estimate actual loan losses in comparison to loan loss provisions reported by banks with lower credit rating?

Is the credit rating effect more significant in banks reporting loan loss provisions in accordance with IFRS 9 Expected loss model when compared to banks reporting loan loss provisions in accordance with IAS 39 Incurred loss model?

1.6 Rationale of the study aim

This study builds upon the existing literature and empirical research on loan loss accounting that documents the link between loan loss provisions and banks' financial stability. More precisely, the research evidence show that loan loss provisions as the largest operating accrual item on bank's balance sheet have significant effect on their equity and reported profits and are significantly relevant for equity valuation purposes

(Elliot, Hanna and Shaw, 1991; Griffin and Wallach, 1991; Beaver *et al.*, 1989). Loan loss provisions therefore represent decision-useful accounting information that are capable of making a difference in the decisions made by users by demonstrating its predictive value, confirmatory value or both[19]. When evaluating decision usefulness, IASB Conceptual Framework for Financial Reporting refers to two fundamental characteristics of financial information, namely relevance and faithful representation. While research has been conclusive about the valuation relevance of loan loss provisions, more vigorous debate exists on the question of faithful representation of loan loss provisions. This is primarily entrenched in the existence of multiple principles on how loan loss provisions can be set and calculated and thus how reliably they represent the level of bank's credit risk. In other words, various models underpinning loan loss provisioning have been proposed and applied throughout the years. The IAS 39 Incurred loss model is built on the principle of 'loss-event criterion' that requires loan loss provisions to be set up only if there is an objective evidence of impairment as at the date of balance sheet. Such requirement restricts provisioning for losses that are considered as probable as of the balance sheet date, and strictly rejects expected credit losses from events anticipated to occur after the balance sheet date. This type of loan loss provisioning clearly restricts the level of discretion whose purported benefit is that it allows managers to communicate private information with users of financial statements (Marton and Runesson, 2017). Despite the importance of conveying private information about credit

[19] 'Financial information has predictive value if it can be used as an input to processes employed by users to predict future outcomes.' (Cf. IASB 2010, QC8).
'Financial information has confirmatory value if it provides feedback about previous evaluations.' (Cf. IASB 2010, QC9).

risk, the introduction of IAS 39 Incurred loss model has been defended on the premise that discretion can also be used opportunistically to engage in earnings, capital and/or tax management. In response to the malpractices of SunTrust Banks that managed their loan loss provisions, US Securities and Exchange Commission (SEC) together with bank regulators suggested that prudence should be at the focus of loan loss provisioning (Beck and Narayanamoorthy, 2013; Wall and Koch, 2000; Ryan, 2007). And thus, prudent approach towards establishing loan loss provisions was suggested as an appropriate way to set up loan loss allowance.

In principle, loan loss provisioning system should reflect the quality of banks' financial asset portfolio and be able to provide sufficient reserves to absorb potential losses if they were to arise. It is therefore critical that loan loss provisioning is not restricted to already-incurred credit losses as it may create greater information asymmetry between the users and preparers and thus hinder credit risk reporting. The issue of insufficient allowances under IAS 39 Incurred loss model has been stipulated as one of the key factors that contribute towards pro-cyclicality in banking business and potentially led to the financial crisis 2007/08. The so-called 'too little too late' type of provisioning enhances the apparent robustness of the bank's balance sheet during economic booms, and by the same measure, weakens the financial position in times of economic busts (International Monetary Fund, 2008; SEC, 2008; ECB, 2008). Therefore, the application of the IAS 39 incurred loss model does not appear to follow the principle of financial stability as it hinders credit risk evaluation and disable bank's ability to build reserves credit for potential credit losses. It can therefore be argued that the application of 'loss-event criterion' hinders both the aim of general-purpose financial reporting and prudential regulatory objectives. "Earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness" (FSF, 2009: p. 4).

The focus of this thesis is therefore on the evaluation of credit risk informativeness under both IAS 39 Incurred loss model and IFRS 9 Expected loss model pertinent for decision making of primary users of financial statements. Given that the adoption of IFRS 9 Expected loss model has been justified on the backdrop of improving timeliness of loan loss provisioning in order to ensure sufficient reserves being set-up for expected credit losses, it may provide relevant decision useful information pertinent in equity valuation and credit risk assessment. Therefore, the aim of loan loss provisioning should be to reflect fairly the level of credit risk a reporting entity is exposed to and thus loan loss provisions should be set up in accordance with expected credit losses. This thesis examines the ability of loan loss provisions determined in accordance with IAS 39 and IFRS 9 to predict future loan losses.

1.7 Scope of the thesis

This study primarily focuses on the proclaimed countercyclical effect of forward-looking loan loss provisioning, and its impact on the stability of financial system relative to more conservative loan loss accounting. This thesis further seeks to establish its evidence based on one specific accounting framework, namely International Financial Reporting Standards. It therefore does *not* cover other potential countercyclical options, such as macroprudential policies, and it does *not* examine the countercyclical effect of forward-looking LLP in other accounting frameworks (for example US Generally Accepted Accounting Principles).

Since the majority of LLP literature has concentrated on the effect of LLP on the quality of accounting information using proxies such as timeliness (Gebhardt and Novotny-Farkas, 2011), and earnings management (Beston and Wall, 2005), the emphasis of this study is on the implications of the amendment to LLP reporting for one important group of financial statement users – financial analysts. Financial analysts play a vital role of information intermediary in the financial markets (Shipper, 1991) by collecting and analysing accounting information with the aim of reducing information asymmetries (Healy and Palepu, 2001) and enhancing market efficiency (Barth and Hutton, 2004). Since the properties of their forecasting ability is conditional on the quality level of accounting information, including credit risk reporting, it is vital to examine how a forward-looking approach to LLP affects their forecasting capability, and given that analyst recommendations feed directly into investment decisions and thus could affect market response, the financial stability also.

1.8 Thesis structure

The remaining parts of this thesis are organised as follows. Chapter 2 discusses the literature on FVA from theoretical and empirical perspective. It presents with three theoretical dimensions on FVA: (i) quality and reliability of fair values, (ii) the role of conceptual framework in development of fair value measurement, and (iii) the role of asset/liability approach in financial reporting. The empirical part on FVA reviews the relevance of FVA for equity valuation, the issues with FVA presentation format, and further discusses the link between FVA and the crisis. Furthermore, Chapter 2 reviews the effectiveness of financial regulation in promotion of financial stability objectives. In particular, it discusses the other factors that could influence procyclicality in the financial sector, namely (i) deviations from the efficient market hypothesis; (ii) economic policies;

and (iii) the role of credit rating agencies. The Chapter then moves on to discuss the effects of procyclicality in banking sector in relation to banks' performance. Towards the end of Chapter 2, the focus shifts on loan loss provisioning, its link to procyclicality, banks' performance and financial stability. Overall, the literature review provides a comprehensive background to the themes investigated in this thesis which will later allow for comparison between the findings of this study's investigations and the findings of previous empirical research.

Chapter 3 of this thesis describes and justifies the philosophical underpinnings of this thesis. The Chapter starts with definitions of ontology and epistemology and explains the research paradigms used in social research as per the Burrell and Morgan (1979) framework. The Chapter further justifies selection of functionalist research paradigm and outline the two methods used in this study: (i) secondary data analysis and (ii) survey research. Relevant aspects of each method are then discussed such as time period, sample selection and data availability in secondary data analysis; and questionnaire validity, reliability and pilot testing in survey research.

Chapter 4 of this thesis presents the first quantitative analysis of the study; it examines the predictive ability of loan loss provisions to estimate actual credit losses in the next accounting period with respect to IAS 39 Incurred loss model and a more forward-looking model, a proxy for IFRS 9 Expected loss model. Specifically, the chapter employs observations from 570 private and public EU banks over the period from 2012 until 2016. First, descriptive statistics of the sample are analysed before the results of a number of regression models reported. In particular, the regression models examine whether and how presence of audit specialist, bank's size and bank's credit rating affect the predictive ability of loan loss provisions. According to the analysis, the predictive ability of loan loss provisions determined by the IAS 39 Incurred loss model is lower relative to the predictive ability of loan loss provisions based on a more forward-looking model. Furthermore, bank's credit rating is found to be a significant factor in predicting the ability of loan loss provisions to estimate future credit losses.

Chapter 5 presents the second quantitative analysis of the study; it examines and evaluates the opinions and views of accounting scholars and practitioners with regards to the usefulness of IAS 39 Incurred loss model and IFRS 9 Expected loss model using survey questionnaire. In particular, this chapter reports the views of participants on the characteristics of financial information, loan loss provisions, as embedded in IASB Conceptual Framework. In addition, the chapter provides supporting qualitative statements from open-ended questions included in survey questionnaire to provide further insights into complexities of loan loss accounting. The findings from survey questionnaires complement the analyses conducted in Chapter 4 and are combined with results from regression analyses to reach an overall conclusion about the research objectives and questions being scrutinised.

Finally, Chapter 6 concludes this thesis. In particular, this chapter summarises the key findings that have emerged from empirical analyses conducted in Chapter 4 and Chapter 5 and discusses the main contributions of the study. Moreover, it outlines the limitations of the current study and explains why these limitations were not addressed. The chapter also provides insights into future research opportunities on loan loss accounting.

1.9 Conclusion

The aim of this chapter was to provide an introduction to the research topic of this thesis. It aimed to introduce the research question and objectives that are justified on the basis of research gap. In addition, the chapter outlined the scope and structure of this thesis to enable reader to navigate across this document.

Chapter 2 Literature Review

2.1 Introduction

This chapter discusses the underlying issues concerning loan loss provisioning and the relevant empirical evidence. The central issue surrounding the way banks provide and recognise loan losses is the method of loan measurement. The economic value of a loan based on fair value accounting has been pronounced as superior to historical cost measurement (Benston, 2005), primarily based on the argument of provision of relevant information for investor decision-making. This chapter extensively reviews both theoretical and empirical evidence on fair value accounting given its increasing preference as valuation basis for financial assets (Laux and Leuz, 2009). While some evidence points to supportive arguments for broader use of FVA, others have expressed concerns over the reliability of fair value information, in particular for assets traded in illiquid markets such as loans (Goh *et al.*, 2015), and during times of financial distress (Barth and Landsman, 2010).

The theoretical perspectives have focused on the conceptual framework and the asset/liability approach in both definition of current and future accounting standards (Whittington, 2008), and the increasing FVA adoption as a prime measurement system in financial reporting (Sutton, Cordery and van Zijl, 2015). The information aggregation hypothesis (Hitz, 2007) is outlined to explain the theoretical basis for accounting standards setters' drive to introduce more FVA into accounting standards: given that market values are considered as objective and virtually unbiased proxy, they are thus viewed as the most relevant to investor decision-making.

The substantive literature on fair value accounting have investigated the value relevance of different levels of fair values and its usefulness in equity valuation. On average, the empirical evidence clearly documents that the higher the level of fair value, the lower the value relevance and thus its utility in investment decision-making. Most of the arguments point to low level of trading activity for financial assets and thus inability to provide up-to-date fair values (Barth, 1994; Petroni and Wahlen, 1995; Carroll, Linsmeier and Petroni, 2003), imperfections in fair values due to noise linked to intrinsic measurement error (Song, Thomas and Yi, 2010) and management induced bias (Badia *et al.*, 2017) all leading to unreliable fair values that are valuation irrelevant.

As discussed in Chapter 1, the global financial crisis raised significant questions about the importance of financial reporting in the banking sector. In particular, the role of fair value accounting, procyclicality and loan loss provisioning have been cited as the key factors that could have contributed to the financial crisis. Therefore, this review of the literature further focuses on the procyclicality, its link to the fluctuations of the business cycle and loan loss provisioning. The evidence suggests that loan loss provisioning is strongly correlated with the business cycle: more loan loss provisions are recognised during economic recession relative to expansionary period, which typically result in insufficient reserves being available once the recession hits leading to further exacerbating effects (Altamuro and Beatty, 2010).

The remainder of this chapter is organised as follows. Section 2.2 discusses the historical developments of fair value accounting and outlines an increasing trend of fair value adoption in accounting standards. Section 2.3 outlines theoretical underpinnings of fair value accounting both emerging from accounting standard setters' and practitioners' point of view. Section 2.4 reviews the empirical evidence concerning fair value accounting, primarily its usefulness for equity valuation purposes. Section 2.5 introduces the factors playing a part in financial volatility/stability. In Section 2.6, the effects of procyclicality on the banking sectors are discussed, and Section 2.7 factors in the loan loss provisioning and the external factors influencing its predictive ability for future loan losses. The final section provides a number of concluding observations.

2.2 Historical overview of developments in FVA

The concept of FVA is not a novelty. It dates back to the nineteenth century when a U.S. Supreme Court case[20] considered some of the principles underlying fair value measurement by stating:

> *"In order to ascertain that value, the original cost of constructions, the amount expended in permanent improvements, the amount and market value of its stocks and bond, the present as compared to the original cost of constructions, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for considerations, and are to be given such weight as may be just and right in each case"* (Smyth v. Ames, 169 U. S., 546, 547, 18 Sup. Ct. 434, 42 L. Ed. 819).

This case referred to several valuation techniques currently used to derive fair value, and the application of judgment when using different types of valuation inputs. However, it was not until early in the twentieth century with the increasing capital requirements and demand for quality financial data, that market values gained prominence in financial reporting (Brief, 1966). The application of market values was predominantly observed for operating assets, as opposed to long-lived assets for which market value was considered as inappropriate given their going concern function (Walker, 1974). Instead, the fixed assets were recorded at cost, and the income was determined as a difference

[20] Smyth v. Ames, 171 U.S. 361 (1898) was an 1898 United Stated Supreme Court case, in which the Supreme Court voided a Nebraska railroad tariff law, declaring that it violated the Fourteenth Amendment to the United States Constitution in that it takes property without the due process of law.

between revenues and expenditures. The critics, however, opposed the recording of capital assets indefinitely at cost, and suggested that permanent assets should also be stated at their current values.

The advocate of this view, Laurence Dicksee mediated the shift in focus from strictly historical view to the view that concedes current and future activities in asset valuation (Chatfield, 1977). Moreover, deliberations from accounting literature inspired by economics further led to support the application of market values in financial measurement. Edwards and Bell (1961), Chambers (1966) and Sterling (1970), the forerunners of Hicksian notion of income, argued that "accountants should use current market values adjusted for changes in general purchasing power, to reflect the value of assets and liabilities" (Georgiou and Jack, 2011: p. 316).

In the aftermath of the Great Depression, there was a general trend towards more conservative accounting in the US. This included a move away from the use of market values to reinforce the position of historical cost accounting as prominent basis in financial reporting. Walker (1992) note that stringent regulation by SEC made common practices like upward revaluations of fixed assets or voluntary disclosure about their current values extinct from financial reporting. This trend was further intensified by the statement of a Committee of the American Accounting Association (AAA, 1948: p. 340):

> *"There should be no departure from the cost basis to reflect the assets of an enterprise at amount higher than unassigned costs. Continuous replacements of assets, frequently of a type different from those replaced, and the practical difficulty of measuring replacement values, emphasize the need for a historical record in terms of the consistent, objective basis of cost".*

In contrast, no predominant practice of valuing assets existed in Britain at the time. Although UK Companies Act[21] specified the required format of accounts, it did not feature valuation and measurement guidelines. This resulted in significant flexibility when preparing balance sheets (Napier, 1995) with mandated use of current values or net realisable values for long-term assets to protect the interests of creditors (Georgiou and Jack, 2011).

Throughout the 1970s, the standard setters were confronted with the challenges of financial reporting impinged by the high level of inflation. Debate over the appropriate measurement method during times of rapid price change resulted in the issuance of SFAS 33 *Financial Reporting and Changing Prices* in the US, and SSAP 7 *Accounting for Changes in the Purchasing Power of Money* in the UK, which required companies to implement current purchasing power accounting. Nonetheless, the two standards were founded on different valuation bases. In the US, SFAS 33 required companies to use the replacement cost or recoverable amount (higher of the net realisable value and value-in-use) of the asset when this was less than replacement cost, whereas, the UK adopted 'value-to-the-business', which mandated assets and liabilities to be recorded at their deprival values (the lower of replacement cost or recoverable amount). The sustained difficulty in application and understanding the results of these standards contributed to their withdrawal during the 1980s. However, the tendency to use current values persisted as the Savings and Loans Crisis[22] exposed the deficiencies of historical cost accounting

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[21] The Companies' Act, 1862. Available at: https://ia600200.us.archive.org/30/items/companiesactwit00pulbgoog/companiesactwit00pulbgoog.pdf.

[22] In the 1980s, the financial sector suffered through a period of distress due to dramatic rise of inflation and interest rates. Savings and loan associations were greatly affected due to: (i) the inability to attract depositors since their interest rates were set substantially below industry average, and (ii) the loss of value of long-term fixed-rate mortgages, their primary source of net worth.

and the emergence of financial instruments called for a development of 'alternative accounting rules' designed to deal with the reporting of new accounting concepts.

The issuance of SFAS 115 *Accounting for Certain Investment in Debt and Equity Securities* by US Financial Accounting Standards Board in 1993, and IAS 39 *Financial Instruments Recognition and Measurement* by International Accounting Standards Committee (IASC) in 1998 introduced the re-acceptance of market values into financial accounting. Meanwhile, the international surge in financial instruments gave rise to deliberations amongst standard setters to develop a common framework for their financial reporting. In December 2000, the Joint Working Group consisting of the International Accounting Standards Committee (IASC) and major accounting standards setters[23] delivered the approach for reporting financial instruments and similar items based on the premise of valuing the present value of the expected cash flows discounted at the market rate of return. The use of FVA has since significantly expanded into different areas of financial reporting. Table 2.1 and Table 2.2 below show the application of FVA across the accounting standards in US GAAP and IAS/IFRS respectively.

[23] The Joint Working Group of Standard Setters comprised representatives of the accounting standard setting bodies represented by the US, Canada, Australia, New Zealand, the UK, Germany, France, the Nordic Federation and Japan.

Table 2.1: FVA in FASB Accounting Standards Codification (ASC).

ASC 410 Asset retirement and environmental obligations	ASC 960 Plan accounting – Defined benefit pension plans
ASC 320 Investments – Debt and equity securities	ASC 715 Compensation – Retirement benefits
ASC 718 Compensation – Stock compensation	ASC 350 Intangibles – Goodwill and Other
ASC 480 Distinguishing liabilities from equity	ASC 420 Exit or disposal cost obligations
ASC 360 Property, plant, and equipment	ASC 825 Financial instruments
ASC 860 Transfers and servicing	ASC 845 Nonmonetary transactions
ASC 805 Business combinations	ASC 815 Derivatives and hedging
ASC 460 Guarantees	ASC 470 Debt

Note: Table 2.1 shows the ASC standards that require or permit fair value measurement as in accordance with ASC 820 (Fair Value Measurements and Disclosures).
Source: Constructed by the author.

Table 2.2: FVA in IASB International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS).

IFRS 5 Non-current asset held for sale and discontinued operations	IFRS 9/IAS 39 Financial Instruments: Recognition and Measurement[24]
IFRS 10 Consolidated financial statements	IAS 28 Investment in associates and joint ventures
IAS 41 Agriculture	IAS 18 Revenue
IFRS 3 Business combination	IAS 40 Investment property
IAS 16 Property, plant and equipment	IAS 38 Intangible assets
IAS 36 Impairment of assets	IAS 19 Employee benefits

Note: Table 2.2 shows the IAS and IFRS that require or permit fair value measurement as in accordance with IFRS 13 (Fair Value Measurement).
Source: Constructed by the author.

[24] IAS 39 was replaced by IFRS 9 Financial Instruments as of January 2018.

With growing prevalence of FVA in accounting standards, it became critical to establish a comprehensive framework in which these amounts are measured and disclosed. In response, FASB issued SFAS 157 *Fair Value Measurements* in 2006, which outlines the measurement system for fair values. By the same token, IASB issued IFRS 13 *Fair Value Measurement* in May 2011, in which it defines fair value, establishes a framework for measuring fair value and requires significant disclosures relating to fair value measurement. Since IFRS 13's adoption in January 2013 the standard has been amended once in December 2013. The two Boards define the fair value as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (IFRS 13.9, IASB 2012). Based on the data used to derive fair values, the standards require firms to disclose a fair value hierarchy: Level 1 (observable inputs from quoted prices in active markets), Level 2 (inputs other than quoted prices that are observable either directly or indirectly), and Level 3 (unobservable inputs generated by entities)[25].

2.3 Theoretical research in fair value accounting

2.3.1 Quality and reliability of fair values

In the extreme case of economic equilibrium, in which all information is incorporated into asset prices, it is generally agreed that the purpose of traditional financial reporting would be limited, if any (Barth and Landsman, 1995; Beaver and Demski, 1979). However, in the real world of imperfect information and uncertainty, financial reporting, in the shape of balance sheet and income statement, plays an important part in economic decision-making and so does the measurement system. A debate about the pros and cons

[25] Further information on the three levels can be found at: https://www.iasplus.com/en/standards/ifrs/ifrs13.

of FVA takes us back to the underlying issue of trade-off between relevance and reliability[26]. Advocates of FVA often appeal to notions of verifiability and objectivity of fair values since these are quoted and taken from the active markets. On the other hand, opponents argue that fair values are subject to greater estimation error by management, and prone to greater managerial discretion. In particular, the reliability concept suffers fundamental problems if fair values are not readily observed on the active markets and management must estimate these using considerable discretion or manipulation (Landsman, 2007). The research suggest that fair values are informative to investors, but the value relevance diminishes with higher level of fair value hierarchy, that is, often subject of management bias and measurement error (Song, Thomas and Yi, 2010). These limitations create information asymmetry between investors and management undermining the reliability of financial statements (Landsman, 2007; Penman, 2007).

Power (2010: p. 201) further suggest that reliability in accounting is a social construct that allows for subjective estimates to acquire authority “when they come to be embedded in taken-for granted routines”. On the similar note, Barth (2007: p. 10) challenges transaction-based view of reliability, arguing that “just because an amount can be calculated precisely, it is not necessarily a faithful representation of the real-world economic phenomena it purports to represents”. Barth’s conception of reliability shifts the attention from transaction-based reliability to notions of markets and the values they provide. However, this idea of reliability greatly depends on the level of market efficiency. Marra (2016) comments that with efficient market theory challenged in recent years, even Level 1 fair values become of questionable reliability.

[26] Relevance refers to the pertinence of an economic phenomenon to a user’s decision making, and reliability refers to the quality level of measurement of an economic phenomenon.

Despite the concerns over fair value fictionality and intellectual incoherence, the proponents frequently argue that they offer a higher and updated level of information to financial statement users supporting its primacy in current standard setters' viewpoint (Danbolt and Rees, 2008, Whittington, 2008). Since FVA is based on the philosophical underpinnings of 'Western' market economies, its application in cultures where market inefficiencies and relational contracting is present may not be suitable. Balfoort, Baskerville and Fülbier (2017) argue that the qualitative characteristics of neutrality and faithful representation in fair value measurement may seriously be undermined in Asian economics and transactions. On the similar note, He, Wong and Young (2012: p. 539) comment that "China's institutions are in many respects incompatible with fair value accounting in China business transactions are often carried out within social and political networks, which benefit little from fair value accounting and corporate transparency in general". Balfoort, Baskerville and Fülbier (2017: p. 365) note that in the context of *guānxì*[27] in China, decision-useful information is conveyed by the means of social and personal relationships, stating "in essence there is no need for fair value information at all; this information is neither relevant, nor reliable [in China], due to its reference to non-existing or non-relevant markets".

Benston (2008) further state two practical misconceptions with the definition of fair value. First, although the definition of fair value requires the use of exit value, in some cases, value-in-use and entrance value are used instead. This inconsistency arises from the individual perception of the value of an asset. For instance, when there is no potential

[27] *Guānxì* refers to "a complex cultural system of personal relationships – and moral obligations – which most Chinese see not only as a natural way of doing business but also as pragmatically necessary" (Burton and Stewart, 2008: p. 1).

purchaser, fair value (exit value) would be equal to zero or even negative, whereas another company might regard the price of the asset as the value to that firm and use *value-in-use*. Second, although transaction cost must not be incorporated into fair value, the opposite is often the case. The inconsistencies in practical formation further undermine the reliability and quality of fair values.

2.3.2 Role of conceptual framework

As part of the convergence process between US GAAP and IFRS to which FASB and IASB committed themselves in the Norwalk Agreement of 2002, *Conceptual Framework Project*[28] seeks to provide consistent theoretical foundation for the convergence of the two sets of accounting standards. The joint project has sparked interest amongst academics discussing the possible implications of the common framework, and its changes, for measurement basis.

The first phase of the *Conceptual Framework Project*, completed in 2010, dealt with the objective and qualitative characteristics of financial reporting. Both frameworks emphasise *decision usefulness* as a general purpose of financial reporting, in particular towards investors and creditors in capital markets[29]. Whittington (2008: pp. 141 – 142) states that this move was ‘a bold step at the time, sweeping away the traditionalist view that accounting is primarily for legal and stewardship purposes, with decision usefulness as a useful possible additional benefit’. However, it is evident that apart from investors and creditors, there is a wide range of other users of general-purpose financial statements,

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[28] There are four joint projects conducted between FASB and IASB; these include Conceptual Framework Project, Business Combinations Project, Financial Statement Presentation, and Revenue Recognition Project.
[29] IASB/FASB (Cf.), OB2.

including the present entity's proprietors – shareholders. The lack of proprietary perspective[30] within general purpose view was acknowledged in a substantial volume of comments from IASB members, stating that decision usefulness entails more than just the prediction of future cash flows. Despite the recognition, it was asserted that its reporting requirements could be subsumed within the general purpose of decision-usefulness, served by providing information relevant to future cash flows.

By referring to *information aggregation hypothesis*, Hitz (2007) proposes a theoretical explanation which could rationalise the investors' expectations on the basis of fair value measures. Based on the theory, "the market price aggregates in an efficient and virtually unbiased manner the expectations of investors in the market concerning future cash flows of the asset or liability" (Hitz, 2007: pp. 327 – 328). IASB Conceptual Framework (2010) also supports this view by stating:

> *"Information about a reporting entity's financial performance during a period may also indicate the extent to which events such as changes in market prices or interest rates have increased or decreased the entity's economic resources and claims, thereby affecting the entity's ability to generate net cash inflows" (Cf. IASB 2010: OB19).*

As part of the Joint Project, there were substantial changes in both form and language of its Conceptual Framework, which are likely to impact the interpretation of the underlying principles. The main change in language was the replacement of reliability by faithful representation. Whittington (2008: p. 146) asserts that this amendment "eliminate[s] the possibility of a trade-off between relevance and reliability" which was seen as an important factor in the precedent framework. The other important aspect that can be seen

[30] The stewardship focus is concerned with monitoring the past and the integrity of management as with its economic performance.

as tilting the criteria of the Framework in favour of FVA is the removal of the phrase 'free from bias'. Many opponents argue that fair value estimation involves significantly more subjectivity (bias) than the alternative measures, and thus this change reduces the force, within the Framework criteria, of this objection (Whittington, 2008). Whittington (2008) further argues that the Conceptual Framework implicitly assumes perfect and complete markets, which is in conflict with, what he refers to as 'alternative view', that regards markets as imperfect and incomplete where financial statements fulfil a stewardship function. Ronen (2008) calls for a more compressive set of theoretical accounting principles and governance reforms that would align the interests of managers and shareholders. This reflects a longstanding debate over the competing objectives of financial statements (informativeness vs stewardship) and the recent developments in conceptual underpinnings, which broadly support FVA (Ronen, 2008; Whittington, 2008).

2.3.3 Role of asset/liability approach

Given the superiority of CF principles in the formation of accounting standards, Sutton, Cordery and van Zijl (2015) point to FVA as 'a default presumption' to serve *general purpose financial reporting* with asset/liability approach following its theoretical underpinnings. The move towards FVA reflects the belief that the key objective of financial statements is to measure *financial position* of a business entity. The asset-liability approach deems income statement merely as a medium to reflect changes in value of assets and liabilities during the accounting period. In contrast, under the revenues/expenses perspective, the income statement is the primary tool which summarises the transactions taken place between the entity and the markets with value added being reported as accounting income. Following the Great Depression and Savings and Loans Crisis, the enthusiasm for superiority of assets and liabilities was revived by adopting a theory prevalent in economics. The pursuit of the FASB/IASB joint project grounded its conceptual principles on a definition of income by Hicks[31]. Although this step has been broadly welcomed by the academic community, some commentators have expressed concern that such theories must be considered in their entirety. As Bromwich, Macve and Sunder (2010: p. 348) argues "cherry-picking parts of a theory to serve the immediate aims of standard setters risks distortion. Misunderstanding and misinterpretation of the selected elements of a theory increase the distortion even more". Bromwich, Macve and Sunder (2010) present reasons why the Hicksian concept of income cannot be invoked to support the asset-liability approach as promoted by IASB/FASB. First, the application of Hick's definition of income requires the presence of complete and perfect markets to reliably capture the value of business in the observable market prices of their net assets. Since markets are rarely perfect or complete and the value of a firm is more than just a sum of its assets (less liabilities), the significant cash flow components are being excluded and not compounded into the value of business. Second, Hicks' own assessment of a measure of income states that it is irrelevant to decision-making – fundamentally in disagreement with Boards' decision-making usefulness objective of *general-purpose financial reporting*. Third, if the focus were to more towards income *ex ante,* it can be argued that it is equally important to consider the standard stream concept of income (Hicks No. 2 income) in order to triangulate the amount to be reported as a firm's expected earnings.

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[31] FASB/IASB follows the definition of Hicks Income No. 1 defined as "the maximum amount which can be spent during [a period] if there is to be an expectation of maintaining intact the capital value of prospective receipts (in money terms)" (Hicks, 1946: pp. 178 – 179).

The primacy of asset/liability approach is evident in the following definition of income proposed by the latest Conceptual Framework Exposure Draft (2015) by IASB:

> *"Income is increases in assets or decreases in liabilities that result in increases in equity, other than those relating to contributions from holders of equity claims" (ED Cf. IASB 2015: 4.48).*

Here, IASB defines income as a by-product of the measurement of assets and liabilities in the balance sheet. Baker and Penman (2016) note that by conceptually assigning primacy to assets and liabilities, an income statement approach involving the matching expenses to revenues is rejected. Although there is generally broad consensus over the importance of an income statement (Penman, 2009), it is less clear what information it should carry in order to improve its relevance to decision makers. Adding to its significance, Yong, Lim and Tan (2016) indicate that chartered accountants perceive the income statement as being the primary financial statement. Penman (2009: p. 358) also points out the substance of income statement when reporting a firm's value of intangible assets values by stating that "income statement perfectly corrects for a deficient balance sheet and the case where it does [report it] so imperfectly".

Similar support is also provided by Sutton, Cordery and van Zijl (2015: p. 126) stating that "Income statements add to the informativeness of financial reporting as they provide a measure of the operating efficiency achieved in the use of a company's stocks". They further note that an income statement should distinguish between permanent and transitory stream of earnings in order to enhance the informativeness of earnings. This debate links back to a longstanding dispute over determination of income and the two competing objectives of financial statements (informativeness vs. stewardship). At the centre of this debate are two schools of thought: (1) current-operating view (dirty surplus accounting), and (2) all-inclusive view (clean surplus accounting). Proponents of dirty surplus accounting argue that income reported under clear surplus or FVA contains a number of transitory and non-recurring items contingent on future events (Goncharov and Hodgson, 2011). These items introduce a noise and uncertainty into earnings and obstruct decision-making due to the fact that users must disentangle components of income that are temporary or irrelevant (Brief and Peasnell, 1996). Therefore, "by eliminating transitory and non-operating flows, the predictive ability of reported earnings, and its consequent usefulness for equity valuation purposes are enhanced" (O'Hanlon and Pope, 1999: p. 460). On the other hand, the advocates of clean surplus accounting argue that the process of recycling becomes an issue in dirty surplus practice, "whereby dirty surplus flows initially booked to equity are, after realisation, subsequently rebooked to equity through the income statement" (Goncharov and Hodgson, 2011: p. 30). Therefore, immediate recognition and reporting under clean surplus accounting would transparently present income flows in one statement and avoid the possibility of double counting.

The theoretical literature has contributed to the understanding of how a specific measurement system can be interpreted to meet different informational needs of stakeholders. Theory has also provided understanding of the political and historical nature of accounting standard setting, which has evidently supported the application of FVA.

2.4 Empirical research in fair value accounting

2.4.1 Valuation and value relevance research

At the inception of empirical research stands the controversy over whether fair value estimates are sufficiently reliable to be valuation relevant. Since *relevance* is one of the two fundamental characteristics of decision-useful financial information[32], fair values are likely to be regarded as relevant by investors, if disclosed fair values are sufficiently reliable. While FVA started as a specific remedy for inaccuracy of cost-based measures for financial assets, early research has documented the fact that although fair values are value-relevant, their usefulness is negatively associated with the level of trading activity (Barth, 1994; Petroni and Wahlen, 1995; Carroll, Linsmeier and Petroni, 2003). This evidence points to the inherent imperfections in fair values, in particular, for the estimates of thinly traded financial assets which can be unreliable and thus valuation-irrelevant. The introduction of fair value hierarchy was designed to enable users to assess the relative reliability and reduce the noise linked to intrinsic measurement error and management-induced bias (Song, Thomas and Yi, 2010).

Succeeding studies (Badenhorst, Brümmer and de Wet, 2015; Magnan, Menini and Parbonetti, 2015) confirm that lower value relevance is related to Level 2 and Level 3 fair values, which supports the argument that investors are more likely to decrease the weight they place on less reliable Level 2 and Level 3 estimates. Since standard setters understand that information asymmetry is greater for these estimates, researchers study firm-internal and external characteristics that could alleviate this impediment. Song, Thomas and Yi (2010) provide evidence that firms with weaker corporate governance mechanisms exhibit greater information asymmetry leading to more severe moral hazard problems and thus lower value relevance.

[32] Relevance and faithful representation are the two fundamental characteristics of decision useful financial information that both IASB and FASB use in setting the accounting standards.

Siekkinen (2016) uses similar reasoning and document that value relevance is positively associated with the level of country's investor protection. The lack of value-relevant fair value information is evident in countries with weak investor protection environments, where only Level 1 estimates are significantly value relevant. Siekkinen (2016: p. 14) suggests that "financial firms in countries with a weak investor protection environment should be entitled to disclose historical value instead of fair value estimates at least for financial assets and liabilities". Bhat and Ryan (2015) also predict and find that banks' market risk and credit risk modelling improve the value relevance of their fair value gains and losses, in particular for less liquid instruments. In response, McDonough and Shakespeare (2015) suggest that risk modelling may improve the faithful representation of fair values by reducing estimation error. They continue noting that risk modelling activities may result in "fair value estimates that are more verifiable and understandable to investors" (McDonough and Shakespeare, 2015: p. 98). Badia *et al.* (2017) echoes these arguments by providing evidence that the conditional conservatism of Level 2 and Level 3 financial assets fair values increases when the measurements are evaluated by more knowledgeable investors, verified by more independent third parties, and disclosed more fully in financial statements. These findings suggest that investors are sensitive to reliability deficiencies in Level 2 and Level 3 fair values, which cause investors to discount these measurements.

Given the effect of firm-internal and external factors on value relevance of fair values, there are legitimate reasons to question the suitability of FVA in emerging economy environments. Since FVA is strongly linked with needs of a globalised and information-based economy (Marra, 2016), its implementation in immature capital markets may not only result in practical shortcomings, it may also act as an impediment in the improvement of the quality of financial information. The use of FVA in developed economies is based on the assumption of efficient markets. However, capital markets in developing economies often experience large price fluctuations due to noise, rather than relevant information. If these prices are incorporated into fair values, it creates abnormal fluctuations in firms' income and equity, potentially undermining both relevance and reliability (Peng and Bewley, 2010).

On the example of emerging capital economy of China, Qu and Zhang (2015) document that the application of FVA, as part of the IFRS convergence process, has not improved the usefulness of financial information. Instead, they point to a decreased value relevance of earnings and book value following the FVA introduction. Given a social construct of accounting reliability (Power, 2010), Zhang, Andrew and Rudkin (2012: pp. 1281 – 1282) explore the implementation of FVA in China as part of a global process of neo-liberalisation and financialisation of political and economic systems, and argue that "the claim to enhanced market efficiency that was to be achieved through the reform[33] is an illusion that is partly constituted through FVA. In reality, the government still controls the proportion of shares it requires to control and influence the market". The resulting information asymmetry for the vast majority of ordinary Chinese investors indicate that Chinese share prices can never reflect fair value, as these depend on a free market in which all parties are willing and knowledgeable, and where transactions happen at arm's length, as in accordance with FASB/IASB definition of fair value.

[33] Zhang, Andrew and Rudkin (2012) refers to The Split Share Structure Reform (SSSR) which is a policy of the Chinese government to reform Chinese capital markets by transforming the share-ownership structure of Chinese listed companies.

With the growing prominence of FVA beyond its suitability for measurement of financial instruments, the research has shifted towards examining FVA in the context of non-financial assets. Given the option to report investment properties at fair value or a cost model, Quagli and Avallone (2010) document that in line with traditional accounting choice theory, information asymmetry, contractual efficiency and managerial opportunism explain the fair value choice. In particular, they find that the size of the company is negatively associated with the use of the fair value model. Since the application of FVA is more costly, Mäki, Somoza-Lopez and Sundgren (2016) further suggest that financial reports become an important medium for communication in companies with low ownership concentration. They provide evidence that firms of Scandinavian and English origin are more likely to adopt fair value model than companies with German or French origin, which suggests that accounting practices in the pre-adoption period have an influence over the reporting choice in the post-adoption period.

Consistent with the proposition that companies choose their accounting method based on cost-benefit trade-off, these findings are in line with prior literature suggesting that firms with closer relationships with banks and insiders (German and French companies) are resistant to applying an accounting alternative that conveys more information to capital markets (Christensen *et al.*, 2015). Similar evidence provided by Hlaing and Pourjalali (2012) shows fundamentally different economic characteristics of fair value adopters for reporting Property, Plant and Equipment (PPE) in terms of their size and ratio of total amount of PPE to total assets. Christensen *et al.* (2015) suggest that an insider orientation may be an important aspect in understanding the lack of incentives to adopt fair value model despite the consensus about its improvements on accounting quality. This stream of literature demonstrates dependence of the fair value choice, when optional, on firms' specific circumstances. Although FVA is generally considered as more value relevant, a benefit-cost trade-off prevails in firms' decision-making when determining accounting choice.

Since prior studies point to a considerable information asymmetry in fair value reporting (in particular in Level 2 and Level 3 fair values), researchers became interested in answering whether and why firms manage fair value estimates. In line with standard setters' expectation, accounting for goodwill and intangible assets provides management considerable latitude to exercise discretion and judgment to convey private information about future cash flows (Jarva, 2009). Challenged by the agency theory, it predicts that managers will exploit the unverifiable goodwill estimates to manage earnings opportunistically in line with their own private incentives (Filip, Jeanjean and Paugam, 2015). Bens, Heltzer and Segal (2011) support this argument by documenting a significant negative stock market reaction to unexpected goodwill write-offs. Furthermore, they document that companies facing obstacles to conduct credible impairment tests (typically small firms) report less significant market reaction, suggesting less reliability in their goodwill write-offs.

Dahmash, Durand and Watson (2009) also provide evidence that although both goodwill and identifiable intangible assets are valuation-relevant, they are not reliable, which is in line with the fact that unverifiable information can be used opportunistically since estimates are difficult to challenge ex post (Ramana, 2008). In contrast, following the adoption of the impairment-only regime for intangible assets[34], Hamberg and Beisland

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[34] The introduction of IFRS 3 and SFAS 142 represented a major change in the accounting treatment of business combinations, including the elimination of goodwill amortisation.

(2014) document that impairments lost their value-relevance after the move from country-specific GAAP to IFRS, which suggests that managerial discretion is not implemented to signal private information to investors. Ramanna and Watts (2012) also provide similar result and find goodwill impairments to follow agency-theory based predictions. In particular, they find some evidence of the relationship between goodwill non-impairment and CEO compensation, CEO reputation, and debt-covenant violation concerns.

2.4.2 Presentation format and fair value accounting

The research on presentation format refers to the issue of isolation and visibility of fair value information. Consistent with psychology-based framework, the results presented by Maines and McDaniel (2000) indicate that presentation format affects how investors perceive the fair value information. A change in reporting location can result in strengthening the perception of importance, in particular, if the change increases the visibility of that information. In other words, investors value differently between the accounting information disclosed and recognised in financial statements, with disclosed information being significantly discounted (Israeli, 2015; Müller, Riedl and Sellhorn 2015). Schipper (2007) indicates that recognised and disclosed fair values possess differential attributes in terms of reliability and information-processing costs. Müller, Riedl and Sellhorn (2015) support this reasoning by providing evidence of reduced discounting in firms employing external appraiser (a proxy of high reliability) and in firms followed by a high analyst (a proxy of low information-processing costs). This further strengthens a suggested positive relationship between information asymmetry and fair value accounting.

Major criticism of FVA relates to reliability concerns of fair value estimates (Landsman, 2007; Ryan, 2008; Song, Thomas and Yi, 2010; Magnan, Menini and Parbonetti, 2015), various studies have suggested that there is a role of supplemental fair value disclosures beyond the minimum requirements specified in IFRS 13 and SFAS 157. Ryan (2008) note that additional disclosers about fair value inputs and measurement techniques used in Level 3 would significantly improve the informativeness level of financial reports. Riedl and Serafeim (2011) suggest that provision of high quality SFAS 157 disclosures could alleviate the information gap across all levels of fair value measurement. Furthermore, Chung *et al.* (2017) find that firms with more subjective estimates are more likely to supplement additional disclosures in view of improving investors' perception of fair values reliability. The emergence of supplementary disclosures is consistent with a perception by managers that there are benefits to such disclosures. Evidence provided by Blacconiere *et al.* (2011) supports this hypothesis, however, there is also evidence pointing to managers using disclosures opportunistically.

Although economic theory predicts that disclosure improves management transparency (Verrechia, 2001), Clor-Proell, Proell and Warfield (2014) question additional disclosure as it may lead to information overload and inefficient information processing. In contrast, they point to 'visibility' of fair values and conclude that "increasing the salience of fair value gains reported in the income statement increases users' ability to weight differences in the subjectivity with which those gains are measured, as disclosed in the notes to the financial statements" (Clor-Proell, Proell and Warfield, 2014: pp. 61 – 62). In other words, the separation of financial information into multiple columns can improve users' judgments about the reliability of fair value estimates. This finding suggests that simple changes to the income statement can facilitate the use of supplemental accounting disclosures. Lachmann, Stefani and Wöhrmann (2015) provide similar evidence on case of IFRS 9, which requires the changes in fair value of liabilities to be presented in other comprehensive income and thus excluded from net income (IFRS 9.5.7.7(a)). Their evidence indicates that the evaluation of firm performance is less biased where fair value gains are reported separately from net income. These results echo the fact that characteristics of the presentation format influence individual information processing and suggest that acquisition of information is enhanced by a degree of isolation. Since degree of visibility is greater in other comprehensive income presentation format, it leads to lower cognitive costs and thus lower information asymmetry (Maines and McDaniels, 2000).

2.4.3 Fair Value measurement and global financial crisis

The recent global financial crisis has turned attention on procyclicality and its effect on the reliability of fair value estimates. A key concern is that fair value measurement exacerbates swings during the business cycle with potential to provoke contagion effect across the financial markets (Laux and Leuz, 2009). Véron (2008) further notes that procyclicality could artificially enhance the apparent robustness of the balance sheet during economic booms, and by the same measure, weaken the financial position in times of economic busts. This is manifested by the fact that FVA provides early signals of depression in asset values, which forces businesses to take action and sell assets early at a price below their fundamental value (Ryan, 2008). Regulators have also expressed concerns that FVA can encourage procyclical lending by exaggerating banks' profits during expansionary times and thus improving banks' ability to access credit (International Monetary Fund, 2008; SEC, 2008; ECB, 2008). Goh *et al.* (2015) and Elbannan and Elbannan (2015: p. 143) observe that whilst Level 1 and Level 2 fair values are priced superior to Level 3 fair values during GFC, there is an indication of "dissipation in the pricing differences of the three type of fair value estimates in the fair value hierarchy". This suggests that investors are concerned with the likelihood that banks might have to liquidate their assets at fire-sale prices during GFC, however, these concerns are alleviated as the economic cycle recovers.

On the other hand, academics emphasise that FVA improves the transparency of financial information by providing timely and relevant financial data, and as such the trade-off between transparency and financial stability needs to be addressed by prudential regulations that "accept FVA as a starting point but sets explicit counter-cyclical capital requirements" (Laux and Leuz, 2009: p. 832). In support, Blankespoor *et al.* (2013) provide evidence that credit risk in the banking industry is better explained when financial assets are measured at fair value. This indicates that fair value information provides the earliest signal of financial trouble, consistent with the theoretical model developed by Bleck and Liu (2007), which suggests that historical cost accounting may conceal a company's true financial performance, while FVA is better equipped to reveal poor economic performance. Amel-Zadeh and Meeks (2013) advocate that bank failures might occur despite capital adequacy and balance sheet solvency due to sudden shocks in liquidity positions.

In the midst of GFC, SEC and FASB faced intense pressure to relax FVA and impairment rules, that were alleged to exacerbate pro-cyclical contagion. In line with these alleged undesirable effects, Bowen and Khan (2014) expect positive (negative) market reactions to propositions that increase (decrease) the probability of FVA and impairment rules being relaxed. Alternatively, if investors consider that relaxing FVA and impairment rules forms an impediment to transparent reporting of underlying economics of banks, the negative reactions to these proposals should be observed on the market. They find that investors deem negative effects of FVA and impairment rules to outweigh any benefits associated with having more transparent and timely mark-to-market financial information. While the result indicates that market participants reacted as if FVA and impairment rules curtail the value of banks, Bowen and Khan (2014) emphasize that this finding does not suggest that FVA is less suitable than historical cost accounting for regulatory purposes. This finding is in line with Laux and Rauter (2017) that note the banks' business model of providing loans and collecting deposits is inherently procyclical. In other words, the banks' individual characteristics drive procyclical leverage (Laux and Rauter, 2017) and thus the magnitude of stock price reactions (Bowen and Khan, 2014).

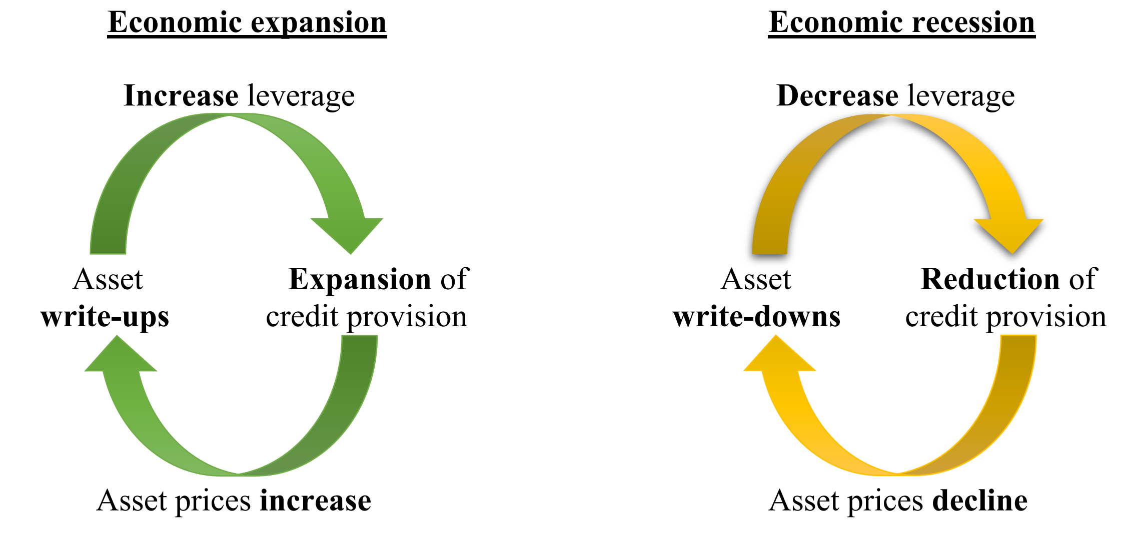
Barth and Landsman (2010) also imply that FVA played a smaller role during GFC and that it was a diminished level of informational transparency associated with measurement, recognition and disclosure of asset securitisations and derivatives that was inadequate for investors to assess correctly the values and riskiness of affected bank assets and liabilities. Even though this view rejects FVA as a primary cause of the recent financial downturn, it highlights that information asymmetry was likely to play an important role. In support, the studies provide no evidence that greater incidence of FVA is associated with lending procyclicality (Xie, 2016), and an increase of procyclical selling behaviour (Badertscher, Burks and Easton, 2012) during GFC.

The collapse of US real estate in 2006 initiated significant price drops on mortgage-backed securities which, according to Fender and Scheicher (2008), were not driven by factors related to the asset's fundamental or intrinsic value. Since these securities are not traded on public exchanges and thus subject of diminished market liquidity, Beltratti, Spear and Szabo (2013) echoes that indices used for their valuation can be overestimated, as seen in the case of Markit ABX.HE index which reported losses of 20 per cent of its value in 2008 (Bank of England, 2008). The resulting write-downs by commercial and investment banks experienced worldwide raised serious question about the reliability of traded asset prices during a financial crisis period and the indices used to track them. Beltratti, Spear and Szabo (2013), on the sample of 49 North American and European banks, examine the value relevance and timeliness of these write-downs during the period of 2007-09. Their empirical evidence documents the fact that fair value and aggregate write-downs are associated dollar-for-dollar with stock returns, suggesting their value relevance and timeliness throughout the financial crisis. Beltratti, Spear and Szabo (2013) further use this as an evidence that managers did not use their discretion opportunistically, but rather in a way to avoid incorporating distorted market information into asset write-downs; the authors stated: "We therefore also reject the claim that managers used the discretion in fair-value standards to delay write-downs or substantially overstate the value of their assets" (Beltratti, Spear and Szabo, 2013: p. 492).

2.5 Financial volatility and financial stability

In the aftermath of the recent financial crisis, a significant debate emerged discussing both the nature and effectiveness of financial regulation to promote financial stability objectives. These deliberations have primarily translated into the context of countercyclical measures designed to reduce the procyclicality in the financial sector. According to Athanasoglou, Daniilidis and Delis (2014: p. 59), "procyclicality of the banking sector is defined as being related to the reinforcing interaction within the financial sector and between the functioning upturns and deeper recessions in the downturns". In other words, procyclicality refers to a phenomenon, in which banks' business closely follows the cyclical patterns of the real economy and generates amplification of banking business activity. For example, it results in excessive growth of loan loss provisions during an economic upturn or excessive contraction of loan generation during an economic recession (see Figure 2.1 below). It is important to mention that inherent cyclicality within the economic cycle is inevitable, however, the business conduct in banking sector could amplify these cyclical fluctuations and lead to excessive patterns of procyclicality, which then interfere with efficient allocation of resources, distort investment decisions, economic growth and financial stability (Agénor and Zilberman, 2015). Some commentators even argue that the role of banks has recently been transformed from their procyclicality mitigation function to amplification function that weakens financial stability and economic growth (Athanasoglou, Daniilidis and Delis, 2014).

Figure 2.1: Procyclicality in financial sector.



Note: Figure 2.1 illustrates the procyclicality in financial sector as reinforcing mechanism closely following the cyclical patterns in economy.
Source: Adapted from Plantin, Sapra and Shin (2008: p. 91).

Athanasoglou, Daniilidis and Delis (2014) outline the following four distinct causes of procyclicality in the banking sector: (1) deviations from the efficient market hypothesis; (2) economic policy; (3) credit rating agencies; and (4) other factors. The following paragraphs will discuss these reasons.

2.5.1 Deviations from the efficient market hypothesis

Procyclical behaviour of banks could be explained by deviations from efficient market hypothesis, according to which all publicly available information is compounded into asset prices. In other words, any new information is incorporated into the share prices rapidly and rationally, with respect to the direction of the share price movement and the size of that movement. In line with strongly efficient markets, capital market participants are able to assess asset prices rationally and distinguish between short-lived market fluctuations and instances with potentially long-lasting consequences. In such case, banks' credit provision would act as a counter-cyclical measure since banks (and other market participants) can fully assess and observe the true state of the economy. However, in reality, markets function in a less than efficient state, which can be explained by the existence of asymmetric information and adverse selection[35] (ECB, 2005; Drummond, 2009). In the banking sector, this translates into a situation, in which borrowers (customers) have more information (knowledge) than lenders (banks/creditors). As a result, lenders are unable to fully assess the attributes of the lending opportunity, which essentially makes the project more viable for the bank that perceives borrower as less risky.

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[35] Asymmetric information described as a 'lemon problem' by Akerlof (1970) refers to a situation, in which contractual parties have different sets of information. This could result in adverse selection, a phenomenon wherein the party with less accurate information is confronted with the probability of loss (Okuyan, 2014).

The perception of low-risk feeds towards further credit expansion during economic upturn and credit contraction during economic downturn, amplifying the fluctuations of the credit cycle. Rajan (1994) also argue that the information asymmetry is directly associated with bank provisioning practices, suggesting that provisions act as a proxy for the quality of bank loan portfolio. In other words, increasing provisions would send negative signals to the market and indicate worsening bank's financial stability. Rajan (1994) further suggests that banks choose provisioning that minimises the negative signalling. This argument is in line with Gebhardt and Novotny-Farkas (2011) stating that restrictive provisioning limits management's opportunistic behaviour, which could have undesirable effects on quality of accounting information. However, it is noteworthy to mention that excessively restrictive provisioning rules may prevent observation of LLP signalling effect. Thus, potentially relevant information about the quality of banks' loan portfolio can be withheld from the users of the financial statements, and could result in lower predictive ability of LLP.

Further deviations from the efficient market hypothesis can be triggered and intensified by the principal-agent problem. Bank managers may be compelled to seek abnormal returns by taking excessive risks either because of significant incentives or limited supervision by shareholders. This situation could contribute to increasing procyclical tendencies in banks' business conduct, worsening of the bank financial condition and eventually the spread of systemic risk. That said, the effect of the principal-agent problem on bank behaviour and procyclicality in lending depends on the ownership structure. Leaven and Levine (2009) suggests that risk-taking varies positively with shareholder structure, which suggests that disperse ownership increases monitoring costs and thus provide a greater opportunity to bank managers to take excessive risks in search for yield.

However, Hammami and Boubaker (2015) provides evidence to the contrary, in which they find that banks with concentrated ownership structure are more related with increased risk-taking conduct. While the idea of reduction of monitoring cost in concentrated ownership seems reasonable (Shleifer and Vishny, 1986), at the presence of self-interested managers, large shareholders may exercise an opportunistic behaviour with less control and monitoring from outside shareholders.

Procyclicality can also be exhibited by herding behaviour in the banking industry, which occurs when financial institutions base their decision on the action of other financial institutions, and not on the information available to them (Cipriani and Lusinyan, 2008). In other words, herding results in inefficient prices of financial assets which may significantly diverge from their fundamental values. Together with the free-riding problem[36], Rajan (2015) further suggests that herding behaviour contributes to market volatility which mitigates investment decision-making and further promotes herding behaviour. Together with regulatory safety nets in the form of government bailouts, banks are convinced that in the event of serious financial problems, they will not be let to collapse. Guttentag and Herring (1986) also suggests that bank's management often focuses on short-term risks and underestimates potential problems that may arise in the future – disaster myopia hypothesis.

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[36] The free-riding problem refers to an economic concept that occurs when people benefit from goods or services provided at no cost. Since such goods and services are essentially free, there is a danger that these may become under-provided or not provided at all. Typically, the free rider problem is associated with services provided by a government, so called public goods. A public good has two key characteristics: (1) non-excludability – it is impossible to prevent anyone from consuming public good; and (2) non-rivalry – consumption of a public good by one individual does not reduce its availability for others. In the banking sector, regulation providing protection to depositors in form of insurance schemes partially funded by taxpayers is an example of public good. However, banks that are considered 'too big to fail' further enjoy implicit public good that gives them an opportunity of bail-out using taxpayer money in case of systemic failure (Mullineux, 2014). This creates a moral hazard problem which could encourage banks to undertake more risky investments in pursuit of high returns (Merton, 1977) given their status of 'strategically important'.

2.5.2 Economic policy

Monetary policy has been identified as the most influential economic policy with the power to exacerbate or mitigate pro-cyclicality of credit cycle. The first channel is represented by the negative relationship between interest rates and credit demand where reduction of interest rates increases credit demand, investments and economic growth. The second channel is so-called credit channel which according to Borio and Zhu (2012) can further be split into the bank lending channel and the balance sheet channel. The bank lending channel suggests that any change in monetary policy will affect the credit supply through the size of the bank's balance sheet. In other words, changes in interest rates could result in gains or losses that eventually impact bank's regulatory capital adequacy and its ability to lend. The balance sheet channel suggests that increase in interest rates leads to decrease in asset values used as collateral by borrowers. As a result, borrowers are then unable to secure the same lending amount as prior to the interest rates increase. This can be further exacerbated if there is excessive reliance on market inputs for valuation of financial assets.

The third channel is the risk-taking channel, which can be defined as "the impact of changes in policy rates on either risk perceptions or risk-tolerance and hence on the degree of risk in the portfolios, on the pricing of assets, and on the price and non-price terms of the extension of funding" (Borio and Zhu, 2012: p. 242). Multiple research evidence provides insights into the relationship between monetary policy and risk-taking in banking industry suggesting that lowering short-term interest rates contributes towards an increase in banks' risk-taking behaviour (Altunbas, Gambacorta and Marqués-Ibáñez, 2010; Delis, Tran and Tsionas, 2012; ECB, 2009).

2.5.3 Credit rating agencies

As discussed and outlined in Chapter 1, during the recent global financial crisis and the subsequent European sovereign debt crisis, a number of highly credit-rated bonds fell into junk status resulting in loss of over 14 trillion US dollars (Scalet and Kelly, 2012). Credit rating agencies[37] play an important role in assessing and evaluating the risk that the issuer of the bond (or other security) will not be able to repay the debt in the event of a default. Athanasoglou, Daniilidis and Delis (2014) explain that credit rating agencies put emphasis on backward-looking evaluation of the credit condition rather than assessing possible future outcome. This situation creates conditions, in which the swings of the business cycle are intensified: credit ratings are disproportionally improved during economic expansions and more downgrades occur during recessions. The so-called 'accelerator' model (Bernanke, Gertler and Gilchrist, 1999) explains that during economic booms, both balance sheets and thus the values of collateral expand, thereby facilitating access to more credit. In addition, banks often relax their lending standards during expansionary period (Lown, Morgan and Rohatgi, 2000) and regulatory bodies exhibit more control power during recessions (Syron, 1991). Bangia *et al.* (2002)[38] also provide evidence of procyclicality in credit rating by documenting credit losses being significantly smaller in boom periods relative to economic downturns. This could suggest that the credit rating process is rather static and ignores the forward-looking approach in determination of one's risk of default. However, credit rating should be assigned on a

[37] There are three major credit rating agencies that currently dominate the market. These include Moody's Investor Service, Standard & Poor's Global Ratings, and Fitch Ratings with 80 per cent of the total market share split equally between Moody's and Standard & Poor's, and 15 per cent of the total market share taken by Fitch (Statista, 2019).

[38] Bangia *et al.* (2002), however, do not control for true underlying risk of default that could, in part, be related with fluctuations in the business cycle. Therefore, the evidence from Bangia *et al.* (2002) can only be interpreted that the credit ratings move pro-cyclically, not that credit ratings are ascribed based on the phase of the business cycle.

'through-the-cycle' basis, and not based upon transitory changes in credit quality (Amato and Furfine, 2004). Through-the-cycle principle refers to credit rating that is unrelated to the state of the business cycle, and solely reflects fundamental financial and business conditions. In contrast with Bangia *et al.* (2002), Amato and Furtline (2004) find that credit ratings do not show undue sensitivity to the economic cycle fluctuations, however, the sign of procyclicality can be estimated in subsamples of the investment grade[39] firms and companies with newly applied or changed ratings. These results suggest that credit rating agencies act in a procyclical manner when they apply new credit rating or change the credit rating for an investment grade company.

2.6 The effect of procyclicality in banking sector

In the previous section, the factors influencing the procyclicality have been discussed with particular attention to those exacerbating this trait of the financial sector. It is important to remember that procyclicality is inherent to the financial sector and thus cannot be completely eliminated. However, excessive swings of various financial sector proxies are to be avoided since they may have damaging consequences on the entire financial industry.

The following sections discuss the implications of procyclicality on the banking sector by evaluating banks' performance, and credit provision.

[39] Credit rating scales separate between investment grade and non-investment grade (or speculative grade) of credit rating. Investment grade includes credit ratings from AAA to BBB-, Aaa to Baa3, and AAA to BBB- for Standard and Poor's, Moody's and Fitch's rating scales respectively. Non-investment grade includes credit ratings from BB+ to D, Ba1 to C, and BB+ to D for Standard and Poor's, Moody's and Fitch's rating scales respectively.

2.6.1 Banks' performance

The procyclicality is not always an undesirable feature. It depends whether procyclicality is being created within the financial sector, being intrinsic, or whether it is solely the effect of the cyclicality in real economy, in which case it is inherent. Intrinsic procyclicality can create serious problems in the banking sector and even result in systemic collapse, such as that witnessed during the recent financial crisis 2007/2008. In such instance, the banking mitigation mechanism to protect financial resources is compromised, and instead becomes an exact opposite – reinforcing mechanism, in which the fluctuations of the economic cycle are being fed by the events in banking sector. In other words, if financial imbalances are allowed to accumulate during economic booms, these could suddenly manifest themselves when the recession hits and lead to real and serious damages. In other words, during economic booms, when lending standards are lax due to high competition and risk underestimation, investments are diverted to risky opportunities with marginally positive or even negative net present value, whereas, during economic downturn, banks do not finance high-return opportunities (as they are typically riskier) (Anthanasoglou, Daniilidis and Delis, 2014) and instead realise losses due to speculative investment decisions made during boom period. Translated into bank's lending capacity, bank's lending significantly increases during economic booms and subsequently falls during recession[40].

2.6.1.1 The institutional memory hypothesis

An important feature of the bank's operational conduct with procyclical tendency can be observed by looking at the key lending proxies. Non-performing loans, loan loss

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[40] If the fall in bank's lending ability is dramatic enough, it could lead to a credit crunch.

provisions and loan charge-offs are, on average, considerably lower during expansion period of business cycle. These measures begin to slowly accumulate towards the end of a boom period, with their subsequent recognition in form of losses taking place during recession. Furth (2001: p. 31) summarises this observation as follows: "Human nature being what it is, lenders and borrowers frequently assume that strong growth will continue unabated. Loans made towards the end of an economic cycle are often underwritten based upon unrealistic assumptions concerning growth."

The statement made by Furth (2001) captures what the institutional memory hypothesis states, that is, the ability of banks and other lending institutions to assess default risk and other risks associated with financial instruments deteriorates as time passes since their last 'learning experience'[41]. At the early stage of a boom period, a bank's management is well aware of the dangers associated with inappropriate lending conduct[42]. With the start of the new business and lending cycle, the lessons learnt from loan bust period are still fresh in bank managers' mind, however, with more time passing, loan officers become less sound in conducting their key tasks. These include screening, analysing and structuring loans as they are formed, and monitoring and implementing policies once the level of credit risk changes (Berger and Udell, 2003).

One factor that plays an important role in the rate of deterioration of loan officers' ability to perform their tasks effectively is the inclusion of inexperienced loan officers. Given

[41] The 'learning experience' refers to the past recession during which banks encountered significant credit losses due to poor risk assessment.

[42] Banks learnt about inappropriate lending behaviour during the past recession and thus, at the beginning of the lending cycle, banks tend to be more conservative with their lending standards. Banks are in particular aware of efficiency of different monitoring methods to assess and identify distressed loans early to mitigate credit losses.

that the role involves a great amount of training and self-consultation, newly appointed loan officers are both less experienced in general, as well as limitedly aware of loan portfolio bust experienced in the past lending cycle, further diminishing their professional judgment. As per the institutional memory hypothesis, the decreasing performance of loan officers can result in an easing of banks' lending standards and thus attract more applicants with a poor credit score. Once the lending cycle approaches its peak, the focus of lending management shifts towards administration of distressed credits. Addressing loans with significant deterioration in credit quality facilitates restoration of institutional memory as managers and officers re-learn competent lending standards. Consequently, banks strengthen their credit standards and separate more thoroughly low- and high-credit-quality borrowers. By doing so, banks are more effective at rejecting uncreditworthy customers, who were otherwise accepted during the booming credit cycle.

To combat worsening lending standards manifested during a boom period, banks could reduce credit authority exercised by lending officers over declining credit requirements closely linked to the loss of institutional memory. Additionally, banks may introduce premiums on loan interest rates or collateral requirements on credits issued to borrower with increased risk of default. Since these policies have a serious detrimental effect on bank-borrower relationship, banks instead tacitly allow for credit standards to be relaxed and even generate negative NPV during an expansion period. Berger and Udell (2003) state that preservation of the bank-borrower ties over long-term is crucial in order to ensure value-maximising strategy even if it results in short-term losses. More importantly, banks can be discouraged to introduce these additional correcting strategies since they would risk separating themselves from competitors[43] (Acharya, 2009). Implementing such policies could further reduce banks' profits and thus draw more attention from both internal and external stakeholders.

Some commentators argue that the institutional memory hypothesis is predominantly applicable to large banks. While large banks are subject to greater agency risks arising from significant separation of ownership and management, small banks, on the other hand, also tend to focus more on closer lender-borrower relationship. Both of these characteristics may exacerbate the institutional memory problem.

We shall now return to the link between bank's performance and cyclicality of the business cycle[44]. There is a large research evidence that evaluates bank's performance in relation to business cycle fluctuations by assessing different factors that may have played a part in definition of bank's performance. These include (1) the application of capital standards; and (2) supervisory regulation.

2.6.1.2 Implementation of capital standards

There is a strong empirical evidence suggesting that the adoption of new capital standards has translated into bank's shrinkage of balance sheet (Bernanke and Lown, 1991; Hancock and Wilcox, 1992; Peek and Rosengren, 1994). As a result of stricter criteria for evaluation of quality of loans during early 1990s, abnormally large loan losses were incurred, which in turn reduced banks' capital and thus lowered credit provision.

[43] Banks' herding behaviour is explained in Section 2.4.1 Deviations from the efficient market hypothesis.
[44] In particular, the research evidence has focused on credit crunches during business cycle downturns.

Peek and Rosengren (1995) further investigates how the shrinkage affects the size of bank's loan portfolio and credit provision while distinguishing between mandatory and voluntary behaviour of bank's management to improve the capital position. Using the sample of all Federal Deposit Insurance Corporation insured institutions in New England, US, over the time period from 1989 to 1992, they conclude that banks with capital adjustments urged by the regulators reduce their loan generation at the faster rate relative to banks adjusting their capital on the voluntary basis. This finding suggests that strict regulatory capital standards may not only restrict credit supply, but also bank's performance and expansion, eventually leading to credit crunch[45].

The adoption of Basel I, which required banks to hold more capital against loans than against securities, is thought to have led to significant decrease of holdings of loans and subsequent increase in holdings of securities (Hall, 1993). The evidence suggests that the proportion of total bank lending generated by commercial and business loans fell from 22.5 per cent in 1989 to 16 per cent in 1994. On the other hand, the proportion of total bank investment in US government securities increased from 15 per cent to 25 per cent over the same time period (Furfine, 2001). Similar evidence is provided by Wagster (1999) which concludes that Canadian, UK and US banks significantly reduced their lending generation, whilst increasing their holdings of government securities during the credit crunch of 1989-92.

In contrast, Berger and Udell (1994) indicate that capital shrinkage had, on average, insignificant effect on banks' credit provision during the early 1990s. In support, the

[45] Credit crunch is a sudden reduction in the supply of loans or a sudden tightening of the requirements to obtain credit from banks or other lending institutions.

evidence provided by Hancock and Wilcox (1994) suggests that banks with less capital than required by risk-weighted standard change the structure of their holdings in favour of more risky assets such as commercial and business loans. This shift occurs at the expense of bank's lending to households such as residential mortgages, and securities. This finding is inconsistent with Hall (1993: p. 408) hypothesis stating that "new standards [Basel I] give banks an incentive to substitute away from loans, which have a high-risk weight, into less risky assets such as government securities".

2.6.1.3 Supervisory regulations

The primary goal of bank regulation and supervision is to enhance the safety and soundness of the financial system, and to mitigate manifestations of moral hazard problems created by the existence of a government safety net. Nevertheless, the same supervisory regulations may have considerable impact on macroeconomic variables when banks, in response, alter their lending behaviour simultaneously. For example, regulators may target risky lenders with intention to curb their credit provision. However, if the regulation results in overall significant reduction in lending supply, this can lead to a credit crunch, slowing down the economy, and resulting in economic recession.

The previous section outlines the evidence concerning the link between capital standards and credit supply. In this section, we summarise some of the evidence on the relationship between credit supply and different supervisory regulations.

During the period from 1989 to 1992, which is generally accepted to be a credit crunch period, US banks substantially reduced lending to commercial and industrial businesses. Lending is thought to have decreased because of an unfavourable rating linked to an increase in supervisory severity. According to Berger, Kyle and Scalise (2001), an adverse rating can incur additional costs to a bank since regulators may force such lending institutions to improve their position. Other potential routes that may be employed by the regulators include increasing the deposit insurance premium or placing restrictions on bank's investments in profitable activities. In order to reverse the heightened risk perception and unfavourable ranking, banks are incentivised to reduce their lending, in particularly to risky borrowers.

Using CAMEL ratings[46] to proxy for supervisory regulations, Berger, Kyle and Scalise (2001) provide evidence that during the credit crunch period, US banks show statistically worse CAMEL ratings relative to pre-credit crunch period of 1986-88. In addition, during the expansion period of 1993-98, there is an indication that CAMEL ratings eased and improved relative to their credit crunch average. Moreover, consistent with the hypothesis, the changes in supervisory regulations affect bank's lending behaviour as predicted. In other words, the regulatory severity proxied by the amount of classified assets is negatively associated with bank's credit provision, measured as future loan ratio, real estate loan ratio, instalment loan ratio, and asset growth ratio (Berger, Kyle and Scalise, 2001). In addition, a positive relationship has been found between regulatory toughness and future treasury holdings ratio, which suggests that banks shift towards less risky capital composition to improve their overall risk perception and to avoid unfavourable supervisory measures.

[46] The CELS ratings or CAMEL ratings are internationally recognised supervisory rating system developed by US regulators to assess and classify a bank's overall condition according to six factors. The following six elements constitute CAMEL rating: (1) capital adequacy; (2) asset quality; (3) management; (4) earnings; (5) liquidity and (6) sensitivity.

The evidence from Furfine (2001) further suggests that an increase in regulatory scrutiny is associated with the observed shift in the composition of bank's portfolio. Furfine (2001: p. 48) states that "immediately following an increase in regulatory monitoring to its credit crunch level, loan growth is reduced by 7.23 per cent, and securities growth increases by 10.7 per cent". Therefore, regulatory scrutiny has the same significant effect on the bank's capital holdings as the risk-based capital requirements (see Section 2.5.1.2 Implementation of capital standards). The veracity of the regulatory scrutiny hypothesis is supported by earlier evidence by Wagster (1999) which found Canadian, US and UK regulators to scrutinise lending standards and risk of loan portfolios more comprehensively following the increase in systemic risk during the early 1990s. This could have led banks to decrease their credit holding in favour of less risky government securities. Furfine (2001) further tests whether the existence of economic recession could explain changes in bank's capital holdings on the grounds of decreased credit demand. The evidence suggests that while economic downturn leads to a decline in both loan and securities growth, the changes are not permanent and can be reversed without alternations to bank's capital holdings.

The previous two sections outline the evidence on the link between bank's performance during the period of credit crunch. Importantly, these studies explicitly ignore the expansionary period of the cycle that precedes credit crunch, and that can have a significant effect on bank's behaviour in the downturn. As mentioned earlier, credit crunch is a period of reduction in credit supply when compared to credit supply observed during boom period. Therefore, if there is significant easing of lending standards in boom period, this may result in generation of lower-quality loans that can become a real problem during downturn. As a consequence of depleted bank's capital, banks reduce their credit provision.

Over-optimism has often been pronounced as one of the reasons that could exacerbate cyclicality of the business cycle. It is generally accepted that the worst economic depressions occur after the period of prolonged prosperity, during which, agents become increasingly optimistic about the future prospects. According to Minsky's (1992) financial instability hypothesis, over-optimism makes financial sector more vulnerable to the effects of systematic risk such as contagion, interdependence and moral hazard. This is primarily because of underestimation of risk exposure that makes banks to ease their credit standards, eventually increasing the likelihood of loan losses during economic downturn.

2.7 Loan loss provisioning

This section focuses on the empirical evidence in relations to loan loss provisioning distinguishing between incurred- and forward-looking models.

The global financial crisis 2007-08 has raised serious concerns about the method for loan loss provisioning prescribed by the incurred loss model in IAS 39. The main criticism of IAS 39 incurred loss model was based on the grounds of delaying the recognition of loan losses until the actual loss is incurred, the so-called loss-event criterion. The criterion does not only restrict management from provisioning for expected credit losses (no matter how likely they are expected to occur), it also reduces the level of discretion that the management may exercise whilst preparing financial statements. Interestingly, the introduction of IAS 39 Incurred loss model has been defended on precisely such reasons

– to curb discretionary loan loss accounting following the malpractices of SunTrust Banks to manage their loan loss provisions in 1998 (Gebhardt, 2016). In response US Securities and Exchange Commission (SEC) together with bank regulators suggested that prudence[47] should be at the focus of loan loss provisioning (Beck and Narayanamoorthy, 2013; Wall and Koch, 2000; Ryan, 2007). Given substantial managerial discretion allowed whilst determining loan loss allowances, SEC further suggested that loan loss provisions should only be provided for the events expected to occur before the balance sheet date. By doing so, management discretion would be significantly reduced, limiting opportunities for earnings management practices.

The rules developed by the accounting standard setters focus on the provision of decision-useful information for general purpose users of financial statements, primarily investors.[48] Loan loss provisions, as the bank's largest operating l item, can be used by banks to manipulate their reported earnings. In some years, managers may be encouraged to overestimate the expected losses to reduce the earnings, whereas in other years, they may be encouraged to underestimate expected losses and thus increase the future earnings in order to report favourable trend in earnings (Benston and Wall, 2005). Because of the LLP significance on banks' balance sheet, LLPs have considerable effects not only on banks' earnings but also on their regulatory capital. Therefore, accounting choices (and thus principles that banks decide to adopt to determine LLP) can be motivated by two dimensions: (1) earnings management incentives, and (2) capital management incentives.

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[47] "Prudence is the exercise of caution when making judgements under conditions of uncertainty. The exercise of prudence means that assets and income are not overstated, and liabilities and expenses are not understated" (Cf. IASB, 2018: 2.16).

[48] "The objective of general-purpose financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions relating to providing resources to the entity" (Cf. IASB, 2018: 1.2).

The evidence on the link between loan loss provisioning and its use for capital management has been inconclusive. Moyer (1990) and Beatty, Chamberlain and Magliolo (1995) find evidence that banks use LLP to manage their regulatory capital, however, no evidence of earnings management has been confirmed. On the other hand, the evidence from Collins, Shackelford and Wahlen (1995) rejects the presence of capital and earnings management. However, it is important to note that these studies examined the period prior to Basel I regime when LLP affected the level of regulatory capital. In other words, additional loan loss provisions increased loan loss allowance and thus increased regulatory capital. Kim and Kross (1998) compare pre-Basel I period and the Basel I period and provide evidence that, due to changes in incentives, banks reduced their LLP after the implementation of Basel I. Ahmed, Takeda and Thomas (1999) further revisit both earnings and capital management motivations and find strong support for the capital management hypothesis, but no evidence of earnings management motivations using loan loss provisioning during the Basel I period.

Earlier evidence from Altamuro and Beatty (2010) find evidence of reduced earnings management and improved LLP validity following the adoption of Depository Insurance Corporation Improvement Act for internal control. This result is in support of SEC proposition that incurred loss model should reduce the earnings management activity given that the time period in Altamuro and Beatty (2010) coincides with the period during which incurred loss model like was applied in the US. The rules of loan loss provisioning were prescribed by *FAS 5 Accounting for Contingencies* that was based on a loss-event criterion. According to FAS 5, recognition of all losses should be based on:

> *"[…] information available prior to the financial statements being issued […] indicates that it is probable that an asset had been impaired […] at the date of the financial statements. It is implicit in this condition that it must be*

probable that one or more future events will occur confirming the fact of the loss" (FAS 5, 1975, par. 8a).

Similar evidence from Peréz, Salas-Fumas and Saurina (2008) suggests that Spanish banks use LLP to manage earnings, but not their regulatory capital. Furthermore, they provide evidence that the value relevance of net operating income has decreased in relation to both generic and specific LLP after the introduction of *statistical provision*[49]. This finding suggests that the implementation of specific provision contributed towards enhanced quality of accounting information since the determination of LLP should closely be linked to its underlying credit risk, not the bank's earnings. The evidence from Peréz, Salas-Fumas and Saurina (2008) does also highlight the relevance of expected credit losses in accounting for credit risk and undermines the rigidity of loss-event criterion when considering the objective of general-purpose financial reporting, that is provision of decision-useful financial information. Laeven and Majnoni (2003) further strengthen the argument by documenting banks postponing loan loss provisioning during the economic boom. In other words, banks' managers do not provide sufficiently for credit losses during times of economic expansion that could result in significantly increased loan losses once the next recession hits, creating capital shocks. This behaviour is also encouraged by the incurred loss model given its strong reliance on loss-event criterion.

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[49] Statistical provision is the regulation introduced by the Bank of Spain in 2002 with the objective to improve recognition of *ex ante* credit risk. Once a loan is generated, expected credit losses starts to exist and these should be reflected in the risk premium and expected cash flow to be paid by the borrower. However, at the time, banks following IAS 39, were not allowed to provide for these expected losses as part of incurred loss model. For that reason, the Bank of Spain introduced 'statistical provision' to reduce cyclicality of LLPs, to improve volatility of banks' earnings, and to enhance awareness of bank's credit risk (Fernández de Lis, Pagés and Saurina, 2001).

In light of previous evidence, the underlying question surrounding loan loss provisioning rules can be summarised as follows: 'How should banks and other lending institutions account for the risk of default on a loan?' The way this is pursued determines how banks recognise changes in expected credit losses in the income statement, and the value at which loans are reported at banks' balance sheet. Benston and Wall (2005: p. 82) state that "the value most useful to bankers, investors and bank supervisors is the economic value of loan as of the balance sheet date". This value is represented by the discounted (present) value of the payments expected to be received by the bank, which is typically less than the contractual amount given that banks cannot precisely estimate loan default risk. With this in mind, if loans are recognised at their economic values, there is no need for LLP recognition since the interest rate is expected to cover for any potential credit losses. However, there is a major problem with recognition of loans in their economic values as these are not readily available and observable on sufficiently liquid markets. The existence of adverse selection and information asymmetry that exists when pricing the loans predicts that potential buyers are willing to pay less relative to the loan valuation by the bank. As a result, loan value and the related losses must be estimated.

This argument brings about the importance of discretion in loan loss provisioning and its potential benefit when used accordingly. It is noteworthy to mention that not all reporting discretion should encourage opportunistic behaviour. Managers do exercise discretion to simply communicate private information with relevant stakeholders to improve usefulness of financial statements. Ewert and Wagenhofer (2005) challenge the claim that rigid accounting standards reduce the incidence of earnings management, and document that while tighter accounting standards enhance the quality of reporting earnings, this further encourages managers to use *real* earnings management. Therefore, tighter accounting rules make *accounting* earnings management less efficient and thus may limit managerial discretion. They further argue that despite accounting earnings management being reduced, the total cost of earnings management can increase. Therefore, intervention in form of tighter accounting rules may not be a preferable option.

However, some commentators argue that observed accounting quality is not solely driven by accounting standards. Various empirical research document the importance of company's reporting incentives in determination of accounting quality. For example, earnings management activity is strongly associated with companies of relatively concentrated ownership structure, and operating in countries with low investor protection environment, small equity markets (Leuz, Nanda and Wysocki, 2003); weak legal system and enforcement mechanisms and strong tax alignments (Burgstahler, Hail and Leuz, 2006). Ball and Shivakumar (2005) further outline the difference in reporting incentives of UK private vs. public entities, suggesting that lower quality of accounting information observed in UK private firms can be attributed to different market demand. In other words, private companies may prefer to use private communication to reduce information asymmetry between managers and other relevant stakeholders. In light of loan loss provisioning, although IAS 39 incurred loss model involves significantly tighter rules relative to forward-looking models, the actual loan loss provisioning practice is not solely defined by the model itself, but rather by the combination of the model and the bank's reporting incentives.

In addition, compliance with accounting standards is determined by the efficiency of country's enforcement. Since January 2005, all European listed entities have been required to prepare consolidated financial statements in accordance with IFRS standards.[50] Since the regulation does not create a single independent authority for compliance and enforcement, IFRS compliance must be maintained and monitored by each member state. Whilst such institutions were created or their role became a part of an already existing authority, the efficiency of EU IFRS enforcers has been questioned multiple times (ESMA, 2019). Using the sample of twenty-six IFRS adopters around the world[51], Daske *et al.* (2008) report that the benefits of IFRS adoption such as increased market liquidity could only be observed in the group of IFRS adopters that have strong legal enforcement mechanism for financial reporting. Li (2010) further provides evidence on the relationship between cost of equity and the IFRS adoption, suggesting that only group of mandatory adopters experience significant reduction in their cost of equity. Furthermore, Li (2010) states that this cost of equity reduction is only observable in countries with strong enforcement environment.

2.8 Conclusion

This chapter has reviewed and discussed a number of empirical studies that have examined the issue of fair value accounting, its connection to bank's loan loss provisioning rules, and the multitude of internal and external factors influencing determination of LLP. The main conclusions that emerges from the studies reviewed in this chapter is that loan loss provisioning on the basis of fair value accounting is problematic since readily observable loan valuations do not currently exist on sufficiently liquid markets. Furthermore, there is a multitude of inherent impediments that undermine

[50] The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.
[51] The sample includes Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Ireland, Italy, Luxembourg, The Netherlands, Norway, Philippines, Poland, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, United Kingdom and Venezuela.

the relevance and reliability of fair values. These include, but are not limited to, over-reliance on market values relative to historical costs; presentation format of fair values; and potential exacerbating effects of FVA in financial crisis.

Another aspect of literature review is based on the evaluation of two competing loan loss provisioning methods, namely incurred loss model and forward-looking model. While the evidence supports the hypothesis that incurred loss model could limit earnings management activity, it also prevents and restricts communication of private information with relevant stakeholders. As Bushman and Williams (2012: p. 15) state: “discretion over bank loan loss provisioning can have beneficial or negative real consequences […], depending specifically on how managers exploit available discretion to shape loan loss provisions”. The adoption of a forward-looking model, the expected loss model, by IASB in January 2018 was motivated by the crisis of the impairment rules that significantly delayed loan loss recognition and led to insufficient allowances under the incurred loss model. Although the empirical evidence on the usefulness of the expected loss model using ex post data does not exist due to data availability, evidence using ex ante data suggest that incurred loss model results in less timely loan loss recognition relative to losses determined using forward-looking model.

Given that LLP is the largest bank’s accrual item, it plays a fundamental role in equity valuation since they directly impact the volatility and cyclicality of banks earnings and the informativeness of banks’ financial statements with regards to loan portfolio’s risk characteristics (Bushman and Williams, 2012). Therefore, LLP can be used to reduce information asymmetries between better informed managers and existing and potential investors. The researcher therefore intends to ascertain whether the expected loss model is likely to improve usefulness of investors' equity valuation process using both quantitative and qualitative methods. The following chapter discusses and reviews the methodology used in this thesis.

Chapter 3 Research Methodology and Methods

3.1 Introduction

The main purpose of this chapter is to outline the methodology and methods adopted for this study. First, the researcher describes the underlying philosophical assumptions of this research to articulate the view researcher holds about "the relationship between knowledge and the process by which it is developed" (Saunders, Lewis and Thornhill, 2009: p. 108). According to Johnson and Clark (2006), it is imperative to reflect upon the philosophical underpinnings and clearly defend them in relation to the alternative choices. Research philosophy is an important component of any academic research since it underpins selection of research strategy and the methods adopted as part of that strategy. Moreover, it is necessary to be aware of these philosophical commitments throughout the research process as they influence not only how the research is conducted but also how the results are interpreted.

The remainder of this chapter is organised as follows. Section 3.2 provides an introduction into the philosophical considerations in research with explicit reference to ontological and epistemological assumptions underpinning all research. Section 3.3 discusses the four research paradigms as identified by Burrell and Morgan (1979), and Section 3.4 justifies the adopted paradigm in relation to this study. Section 3.5 introduces the research methods selected for this study, the section explains the suitability of combining both primary and secondary data when addressing the research objectives. Sections 3.6 and 3.7 describe the key aspects of secondary data analysis and survey research respectively. Section 3.6 comments on time period, sample selection, method of analysis and data employed for secondary data research, while Section 3.7 comments on validity, reliability and pilot testing of survey questionnaire, and ethical considerations of primary data collection. Section 3.7 concludes the chapter.

3.2 Ontology and epistemology

"Research is a process of intellectual discovery, which has the potential to transform our knowledge and understanding of the world around us."
(Ryan, Scapens and Theobold, 2009: p. 7)

The central debate amongst the philosophers concerns the matters of ontology and epistemology. According to Easterby-Smith, Thorpe and Jackson (2015: p. 134), "ontology is about the nature of reality and existence". In other words, ontology is a system of assumptions that represents an interpretation by an individual about what is considered a fact. The study of ontology focuses on the following questions: 'What things exist?', 'Is there such a thing as objective reality?', or 'What does *to be* mean?'.

As ontology is concerned with *what we know,* epistemology is the study concerning *how do we know what we know*. Therefore, epistemology deals with 'the nature of knowledge, its possibility, scope and general basis' (Hamlyn, 1995: p. 242 in Crotty, 1998: p. 8). Maynard (1994: p. 4) highlights the relevance of underlying epistemological assumptions in research: "[e]pistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate". Hence it is imperative to establish, describe and clearly justify adopted epistemological stance within the research study.

Both ontological and epistemological assumptions tend to emerge together making separation of the two impossible and impractical. For example, realism, an ontological stance assuming that reality exists separate of one's mind, often entails objectivism, an epistemological notion suggesting that meaning is inherent to an object itself and not formed by one's consciousness.

Easterby-Smith, Thorpe and Jackson (2015) outline four ontological notions: (i) realism, (ii) internal realism, (iii) relativism and (iv) nominalism (see Table 3.1 below). These stances should be seen on the continuum depending on how the researcher views the reality, either as independent of individual consciousness or not.

Table 3.1: Ontologies according to Easterby-Smith, Thorpe and Jackson (2015).

Ontology	**Objective**		**Subjective**	
	Realism	**Internal Realism**	**Relativism**	**Nominalism**
Truth	One single truth	Truth exists, but is concealed	Multiple truths exist	No universal truth exists
Facts	Facts exist independent of one's consciousness	Facts exist, however, must be accessed	Facts depend on one's viewpoint	Facts are human perceptions

Note: Table 3.1 summarises the four ontologies by considering their interpretation of truth and facts.
Source: Adopted from Easterby-Smith, Thorpe and Jackson (2015: p. 141).

The realism asserts that what the senses show us as reality is the ultimate truth. Thus, the objects do exist independent of our conscious mind. This is in stark contrast with nominalist position stating that 'reality is no more that the creation of people through language and discourse' (Easterby-Smith, Thorpe and Jackson, 2015: p. 140). Hence there is no one single truth and the central question of nominalism is concerned with how human perceptions form different versions of truth.

The key idea of realism asserts separation between the social world and tangible structures. It suggests that even without consciousness, the reality (as we know it) exists and can still be observed and measured. In other words, the sun exists regardless of whether we are conscious of it or not. As Macquarrie (1973: p. 57) outlines:

> *"If there were no human beings, there might still be galaxies, trees, rocks, and so on – and doubtless there were, in those long stretches of time before the evolution of Homo sapiens or any other human species that may have existed on earth".*

Ontologically, realism proclaims the existence of reality prior to the consciousness. Thus, a person is born to already-structured existence of reality where social world co-exists independently. Hence realism does not reject the existence of social world.

Internal realism has developed in response to the inherent problem associated with the foundation of realism, namely its *metaphysical assumption.* The metaphysical notion of realism highlights the view that the world is independent of our assumptions, our opinion, our beliefs and so on. However, in social sciences, researchers are interested in the behaviour of individuals and societies rather than inanimate objects and structures. This has led to a debate that questions the suitability of realism in studying human constructs. For example, social aspects such as discrimination and social class exist as real phenomena with tangible effects on variables such as income and education. However, it could be rather difficult to agree upon how to identify and measure these phenomena. Ellis (1988: p. 409) summarises internal realism as follows:

> *"An internal realist is one who accepts both a scientific realist ontology and an internalist theory of truth, such as a coherence or pragmatic theory. A metaphysical realist is one who combines a realist ontology with a metaphysical, or correspondence theory of truth. It is my view that a scientific realist should be an internal realist, because the only acceptable truth theory compatible with a genuine realist ontology is a kind of pragmatic theory which identifies what is true with what it is right, epistemically, to believe."*

The key essence of relativism is the notion that knowledge, reasonings and procedures of justifications are the result of different conventions and that their authenticity is confined to the context giving them authority. Referring back to the example of two social constructs of discrimination and social class, a relativist ontology asserts that different people would experience these concepts differently depending on a variety of factors. Therefore, relativism proclaims that no single truth is there to be discovered, but rather multiple perspectives exist about the same concept. According to Collins (1983: p. 88) "what counts for the truth can vary from place to place and from time to time".

The nominalist notion goes a step further and views social reality as creation of human's perceptions resulting in no universal truth. As Burrell and Morgan (1979: p. 4) posit:

> *"The nominalist position revolves around the assumption that the social world external to individual cognition is made up of nothing more than names, concepts and labels, which are used to structure reality. The nominalist does not admit to there being any 'real' structure to the world which these concepts are used to describe. The 'names' used are regarded as artificial creations whose utility is based upon their convenience as tools for describing, making sense of and negotiating the external world".*

As outlined earlier, epistemology is concerned with the nature of knowledge and how we make sense of it. There are, of course, number of different epistemologies, however, for the purpose of this overview, the researcher's focus is on two contrasting philosophies as outlined by Easterby-Smith, Thorpe and Jackson (2015), namely *positivism* and *social constructionism.* The key difference between the two philosophies is embedded in "a way of looking at the world and making sense of it" (Crotty, 1998: p. 8). The positivist approach assumes that the social world exists externally, and that research can ascertain knowledge about the world through objective techniques rather than being inferred subjectively through sensation, reflection or intuition. Comte (1853: p. 3) encapsulated the key idea of positivism by stating: "there can be no real knowledge but that which is based on observed facts". Comte's assertion is embedded in two beliefs: first, an ontological notion that reality is independent of one's mind, and secondly, an epistemological notion that knowledge can be measured using objective methods. Burrell and Morgan (1979) further adds that the fundamental purpose of positivism is to seek predictions about what happens if certain conditions are met. This is often done by examining for consistencies and causal relationships between a variety of proxies. While positivism is traditionally associated with natural sciences, it should not be mistakenly referred to as empiricism[52]. In a social sciences perspective, positivism refers to "working with an observable social reality and that the end product of such research can be law-like generalisations similar to those produced by the physical and natural scientists" (Remenyi *et al.*, 1998: p. 32). Positivists often use existing theories to stipulate relevant hypotheses and collect and analyse credible data to prove or refute the hypotheses stated. When adopting positivist notion, research must be conducted in "a value-free way" (Saunders, Lewis and Thornhill, 2009: p. 114). This emphasises that a researcher maintains a neutral position so that knowledge can be discovered objectively. Some critics, however, argue that 'a value-free way' is impossible to achieve since a researcher adopting positivism exercises a choice over the epistemological assumptions of a study. Thus, it is advocated that positivist researchers adopt highly structured research methodology and methods to allow replication by other researchers (Gill and Johnson, 2002). In addition, positivism highlights the use of quantifiable data and statistical analyses.

[52] The key essence of empiricism is the role of experience, stating that all knowledge is generated from the act of experience. Whilst experiences can be acquired using different modes such as sensory, moral, religious; empiricists strongly rely on sensory stimulation (Alston, 1998). This, however, can become a problem since it becomes obvious that not all knowledge is a result of experience. For example, if presented with blank paper, the visual sensory experience confirms that the paper is indeed blank. However, similar logic is difficult to be applied in the example of our general beliefs such as that a paper is to be written on. Yet empiricists assert that our belief that a paper is to be written on can be traced back to a particular perceptual experience when we wrote on a paper.

Social constructionism has largely developed in response to the limited achievement from application of the principles of positivism in social sciences. Social constructionism, often referred to as an interpretive method (Habermas, 1970), regards the world as 'socially constructed' where people provide meanings based on their individual experience and pre-existing frameworks of understanding. The principles of social constructionism originate from work of Berger and Luckman (1966), Watzlawick (1984) and Shotter (1993) where they focus on the connection between individual's mind and the perception of knowledge. In other words, social constructionism regards knowledge as human product, which is socially and culturally shaped in an active manner and not something which can be independently discovered (Gredler, 1997; Ernest, 1999). Crotty (1998: p. pp. 8 – 9) summarises constructionism as follows:

> *"[Constructionism] rejects the vie of human knowledge. There is no objective truth waiting for us to discover it. Truth, or meaning, comes into existence in and out of our engagement with the realities in our world. There is no meaning without a mind. Meaning is not discovered but constructed. In this understanding of knowledge, it is clear that different people may construct meaning in different ways, even in relation to the same phenomenon."*

From Crotty's statement above, it becomes clear that constructionism emphasises people's individual and collective thoughts and feelings, and their communications styles and manners. Moreover, constructionists focus on personal experiences and attempt to understand these by learning about individual perceptions in response to external stimuli.

To illustrate the two epistemologies, consider the research topic of student motivation. The positivist would typically start the investigation by assuming that a causal relationship exists between student motivation and various factors identified in the extant literature. The positivist would then define the way to measure student motivation that could be based on standardised verbal reports from students or use self-designed proxy.

Once a large amount of data is collected, a positivist would adopt statistical analyses to test the hypotheses stated in the beginning. In contrast, social constructionists would want to find out how students define the motivation themselves, what motivates them and perhaps what techniques and strategies can be used to enhance their motivations. Constructionists would focus on several cases of students to collect and analyse rich data (see Table 3.2 below that shows the fundamental differences between positivism and social constructionism epistemology in relation to key aspects of a research study). Clearly, there is a relationship between ontology and epistemology with positivism fitting into realist ontology, and social constructionism fitting with nominalism. The following section will discuss the research paradigms used in social sciences.

Table 3.2: Implications of positivism and social constructionism.

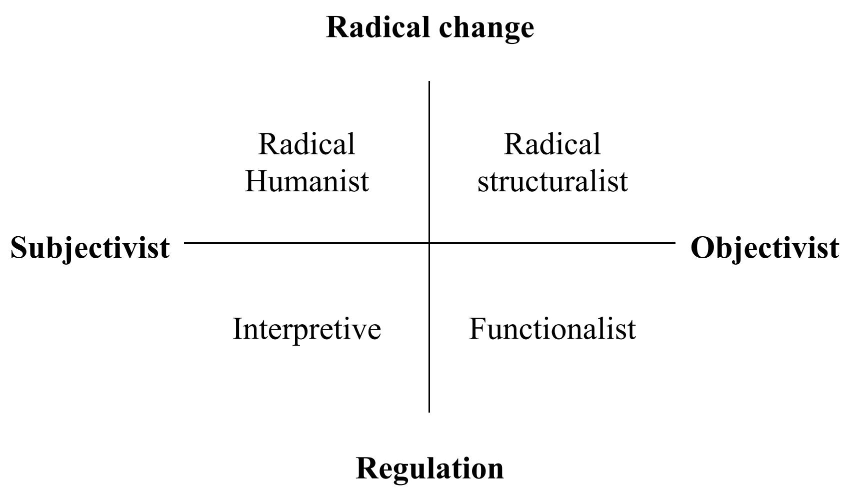
	Positivism	**Social constructionism**
Researcher	Neutral and independent	Part of the study
Individual interests	Irrelevant	Central drivers
Explanations	Causality	Enhance general understanding of the subject
Research approach	Hypotheses testing and deductions	Variety of data from which views are induced
Concepts	Precisely defined and measured	Incorporate stakeholder perspectives
Units of analysis	Reduced to simplest terms	Complex situations
Generalisations	Statistical probability	Theoretical abstraction
Sample	Large random sample	Small number of specific cases

Note: Table 3.2 contrasts positivism and social constructivism in relation to eight fundamental features of research.
Source: Adapted from Easterby-Smith, Thorpe and Jackson (2015: p. 149).

3.3 Research paradigms

According to Burrell and Morgan (1979), social theories can be studied using two possible dimensions: (1) in terms of assumptions about the nature of science (subjective and objective dimension), and (2) in terms of assumptions about the nature of society (regulation and radical change dimension). By combining these two dimensions, Burrell and Morgan (1979) devise a framework that postulates four paradigms for social sciences: (i) functionalist; (ii) interpretive; (iii) radical humanist; (iv) radical structuralist.

Figure 3.1: Four paradigms developed by Burrell and Morgan (1979).



Note: Figure 3.1 shows four distinct paradigms for social research in relation to two dimensions (nature of science; and nature of society).
Source: Adopted from Burrell and Morgan (1979: p. 22).

The functionalist paradigm approaches the subject from an objectivist point of view. This paradigm is also regulatory, meaning that the research adopting this notion will be concerned with social order, solidarity and actuality[53]. In other words, a researcher would be interested in rational explanations of the current status quo and clear development of recommendations towards improvement of current affairs. Thus, the key element of functionalist notion is the presence of rational entities where rational explanations can offer solutions to their concerns.

Contained at the bottom left quadrant in Figure 3.1 above is the interpretive paradigm, which is rooted in principles of the sociology of regulation and subjectivist approach to study social world. A researcher working within the tenets of an interpretive paradigm is typically concerned with 'the fundamental nature of the social world at the level of subjective experience' (Burrell and Morgan, 1979: p. 28). This paradigm refers to philosophical position of social constructionism rather than emphasising rationality, and it attempts to discover irrationalities that could facilitate understanding of the very basis and source of social reality.

On the top left corner of the quadrant is included radical humanist paradigm that highlights subjectivist and radical change dimension. As outlined in interpretative

[53] One of the dimensions for studying social theories according to Burrell and Morgan (1979) considers the assumptions about the nature of society (a continuum between regulation and radical change). Burrell and Morgan (1979) refers to theorists who are concerned with studying society with intention to provide explanations about its underlying unity as leaning towards regulation side. In other words, sociology of regulation attempts to understand and explicate a society as one entity, and the forces that hold it together. On the other hand, theorists of sociology of radical change are concerned with finding explanations for 'deep-seated structural conflict, modes of domination and structural contradiction' (Burrell and Morgan, 1979: p. 17). This type of sociology is interested in forces that emancipate human to confront structures limiting one's potential for development. For that reason, sociology of radical change seeks to document potentiality as much as actuality. According to Burrell and Morgan (1979: p. 18), the sociology of regulation is concerned with: (i) the status quo, (ii) social order, (iii) consensus, (iv) social integration and cohesion, (v) solidarity, (vi) need satisfaction, and (vii) actuality, whereas the sociology of radical change is concerned with: (i) radical change, (ii) structural conflict, (iii) modes of domination, (iv) contradiction, (v) emancipation, (vi) deprivation, and (vii) potentiality.

paradigm, radical change features critical perspective of a social world. As Burrell and Morgan (1979: p. 32) outline:

> *"One of the most basic notions underlying the whole of this paradigm is that the consciousness of man is dominated by the ideological superstructures with which he interacts, and that these drive a cognitive wedge between himself and his true consciousness. This wedge is the wedge of alienation or false consciousness, which inhibits or prevents true human fulfilment."*

This approach aims to provide critique of the existing status quo while placing an emphasis on human consciousness.

On the right-hand side of the upper part of the quadrant in Figure 3.1 above is placed radical structuralist paradigm. This paradigm adopts an objectivist and radical change dimension. In other words, it is concerned with achieving fundamental change that is rooted in relationships and regularities identified within a social world. Clearly, this paradigm shares some similarities with functionalist paradigm since they both focus on objectivism, however, in contrast, 'the radical structuralists concentrate upon structural relationships within a realist social world' (Burrell and Morgan, 1979: p. 34). Radical structuralists stress that radical change is inherently built into the structures of society, and they attempt to explain the relationships existing between these forces.

3.4 Research paradigm underlying this study

Selection of a particular research paradigm implies that the researcher views the world in particular way. This research adopts a positivist approach to answer the research questions and research objectives stated in Chapter 1. Being a mainstream research philosophy in the field of accounting and finance, by implementing positivism, the researcher assumes the separation between the subject (a researcher) and the object (a knowledge). In other words, the researcher believes that 'social reality exists as meaningful entity independent of consciousness and experience, and that a scientific approach can attain the objective truth and meaning about this entity (Andrejcik, 2016: p. 30). Given that this study is interested in seeking and predicting the relationship between loan loss provisions and credit losses, it assumes that logical explanations exist describing the interactions between the relevant variables based on rational human behaviour. Furthermore, the positivist view implies that these relationships can be established based on empirical observations, which will constitute measurement of LLP and other relevant accounting and financial variables readily available on databases. 'In other words, it is based on roughly the same metaphysical assumptions as the natural sciences and applies similar empirical scientific methods' (van Mourik, 2013a: p. 46). As Schroeder, Clark and Cathey (2001: p. 1) further outline about the goal of positivist view:

> *"[t]he goal of accounting theory is to provide a set of principles and relationships that provide an explanation for observed practices and predict unobserved practices. That is, accounting theory should be able to explain why business organizations elect certain accounting methods over other alternatives and predict the attributes of firms that elect various accounting methods. Accounting theory should also be verifiable through accounting research."*

Furthermore, this study does not seek to provide radical change to the existing status quo, which is considered to be the current loan loss provisioning guidelines. It is also not concerned with emancipation or other power asymmetries between various stakeholders using loan loss provisions in their decision making. Rather, the approach adopted asserts that the way loan loss provisioning is conducted could influence the predictive ability of credit losses. Thus, this thesis is situated within the functionalist paradigm of social research.

As stated at the beginning of this chapter, identification and adoption of relevant research paradigm imply important assumptions about how the research perceives knowledge and the process the knowledge can be developed. A research paradigm does not only imply inherent assumptions, it also provides necessary guidelines about the choice of research strategies available to investigate the research topic. In relation to this thesis' adopted paradigm – functionalist paradigm, it emphasises the independence of the researcher from the researched subject, it specifies in advance expected results in form of hypotheses, and it also defines the terms of measurement of relevant variables. This paradigm further highlights use of large, as far as possible, unbiased samples to facilitate statistical analyses, replicability and generalisation of findings (Ryan, Scapens and Theobold, 2009). All of these assumptions support the idea that the current research study is functionalist in nature.

This thesis builds on a key dimension of accounting theory that defines the quality of accounting information. In particular, this study focuses on the predictive ability of LLP that constitute to be a proxy for the quality of loan loss provisioning rules. The predictive ability of LLP is defined on the basis of how strongly the amount of loan loss allowance recognised in year *t* is associated with the actual loan losses in year *t+1*. By comparing the predictive ability of the two models, the researcher will be able to identify the model with the ability to enhance value-relevant information necessary to estimate and assess the level of credit risk. Given that credit risk reporting is a crucial element in bank's market valuation, the predictive ability of loan loss provisioning is also important in the process of equity valuation. The key assumption here is that LLP, as the largest accrual item on bank's balance sheet, conveys important information about the bank's ability to generate future cash flow since it represents its potential to collect interest and principal payments from borrowers. As per Copeland, Koller and Murrin (1996), the discounted value of future cash flows has a near-perfect correlation to share prices, which are considered a proxy for equity valuation. This principle is also documented in the informational perspective of the objectives of external financial reporting which states that while ‘the main type of financial statement user is assumed to be the investors who invest in securities primarily for the purpose of maximising their investment returns […] information that serve investors is assumed to serve other users as well’ (van Mourik, 2013b: p. 61). The LLP are relatively objective information, which can be reality obtained from financial databases or financial statements published by companies. This ontological assumption about the reality of knowledge presupposes that the knowledge is independent from the researcher and waiting to be discovered using relevant tools of investigation.

For the purpose of this study, quantitative methods are primarily employed to address research objectives outlined in chapter 1. More specifically, this research adopts the combination of secondary data analysis and survey research methodology to answer the research objectives. In the first step, the secondary data analysis method utilises existing data on credit risk reporting to establish the predictive ability of each model for loan loss provisioning. And in the second step, survey research is used to ascertain the views of investors and academics on the usefulness of the two models for loan loss provisioning. Both of these methods generate quantitative data that are then used in statistical analyses to provide findings that are intended to be generalisation amongst the population of the two models studied. The researcher views the topic as the one to which rational explanations exist and solutions and recommendations can be developed. These key assumptions clearly suggest that this thesis is located within the functionalist paradigm.

3.5 Research methods

The primary purpose of this study is to evaluate and examine which model – *IAS 39 Incurred loss model or IFRS 9 Expected loss model* – has superior predictive ability to estimate actual future loan losses. Therefore, the researcher aims to establish a causal relationship between the two key variables, namely, loan loss provisions and actual loan losses, and observe whether this causal relationship is stronger when LLP are estimated using IAS 39 Incurred loss model or a forward-looking model. Therefore, this thesis adopts explanatory research type, in which "the emphasis is on studying a situation or a problem in order to explain the relationship between variables" (Saunders, Lewis and Thornhill, 2009: p. 140).

In terms of the research methods, the researcher first conducts secondary data analysis to evaluate the predictive ability of each loan loss provisioning model. Secondary data is collected from BankFocus database that provide information on various accounting and capital markets variables. Secondary data analysis method in accounting research has become "the mainstay of mainstream accounting journals with studies predicting and testing the stock price effects of changes in accounting policy. The idea was to identify accounting policies that would yield useful information for investors" (van Mourik, 2013a: p. 46). However, this study does not use capital market metrics such as stock prices or stock returns, instead, it aims to establish the link between LLP and actual loan losses, the two accounting variables, which can inform investors about the usefulness of each model for credit risk reporting purposes. Thereafter, survey research is employed to ascertain the view of investors and accounting and finance academics about the usefulness of each model for equity valuation purposes[54]. Existing and potential investors are the primary users of financial statements and are regularly involved in equity valuation. It is also important to ascertain the views of accounting and finance academics since they have criticised potential delaying of loan losses under the incurred loss model, which could have detrimental effects on quality of financial information provided.

3.6 Secondary data analysis

The philosophy of positivism asserts that only factual knowledge gained through observations is trustworthy. By choosing this approach, quantifiable observations will be used as the data set for this study. In the view of fundamental analysis, investors rely upon financial statement information to determine the intrinsic value of a stock whilst conducting equity valuation.

The data collected for this study is publicly available on the databases that were accessed over the internet. Whilst, for the purpose of this thesis, the secondary data were collected through database, according to the Fourth EU Company Law Directive, every EU company with limited liability, regardless of whether it is public or private, is required to publish an annual account, an annual report, and the opinion of the person responsible for auditing the accounts in the central register, commercial register, or companies register in the Member State of its corporation (Council Directive 2009/101/EC art. 2). Thus, the accounting information collected for the secondary data analysis are readily available for public use. The data for the secondary analyses were collected from Moody's Analytics BankFocus database between September 2018 and March 2019.

[54] IASB Conceptual Framework (2018) outlines that the reporting entity should provide relevant financial information to existing and potential investors, lenders and other creditors.

3.6.1 Time period and sample selection

This study evaluates the predictive ability of loan loss provisioning in relation to two distinct models: (1) IAS 39 Incurred loss model and (2) IFRS 9 Expected loss model. The Incurred loss model was prescribed by *IAS 39 Financial Instruments: Recognition and Measurement* with its first exposure draft issued on October 1984. However, it was not until December 1998 when the International Accounting Standards Committee (the predecessor of the International Accounting Standards Board) approved the standard. While there were attempts to introduce more principles of forward-looking model for loan loss provisioning in the June 2002 Exposure Draft[55]. Although the changes introduced as part of the IASB's June 2002 Exposure Draft have moved loan loss provisioning towards the expected cost approach at the portfolio level, the revised version of IAS 39 issued in December 2003 asserted an overall incurred loss model. It was not until November 2009 when the first version of IFRS 9 Financial Instruments replaced IAS 39. In 2014, the IASB issued a complete IFRS 9 standard including the new expected loss impairment model, amongst other amendments. This version completed the IASB's financial instruments project and the standard came into effect for reporting periods beginning on or after 1 January 2018.

It becomes evident that there is insufficient time period that could be employed for the evaluation of the expected loss model given that it has been in effect only since January

[55] In 2001, the IASB embarked on the project to introduce the improvements to *IAS 32 Financial Instruments: Presentation* and IAS 39 Financial Instruments: Recognition and Measurement. IAS 39 Exposure draft was subsequently published in June 2002, which was less than a year since the initiation of the project. The improvements to loan loss provisioning were discussed on two occasions during the IASB meetings. First, the Board adopted the proposition that loans not impaired on the individual basis should be included in the collective assessment of impairment. Secondly, the Board suggest that in collective assessment expected credit losses may be incorporated in cash flows as well as in discount rate (Camfferman, 2015). The two amendments to IAS 39 were welcomed by the Basel Committee that strongly supported the proposed collective evaluation.

2018. Therefore, the research strategy adopts proxy for banks using expected loss model as those reporting in accordance with local EU GAAPs. EU local GAAPs are prescribed by the bank accounting directive 86/635/EEC (EEC, 1986). According to this directive, reporting entities should use the lower-of-cost-or-market method to measure financial assets. Additionally, paragraph 37 of EU directive permits member countries the option of measuring and recognising LLP to report underlying credit risk. Marton and Runesson (2017: p. 164) argue that "local [EU] GAAP lead to earlier recognition of credit losses compared to IFRS in most cases and require more judgment than IFRS". Since January 2005, all European listed entities have been required to prepare consolidated financial statements in accordance with IFRS standards[56]. Several countries also adopted IFRS for unlisted banks. Evaluation of predictive ability of LLP in the European Union context provides a favourable research setting since the change from local GAAP to IFRS occurs at different times at the EU. This allows for a separation of the effects of accounting standards from other factors that may influence loan loss provisioning. This study includes both public and private EU banks to ensure that there are observations for banks reporting using the forward-looking model[57].

For the reasons described above, the researcher initially aimed to collect accounting data for the period from 2000 until 2017. However, upon the initial perusal of the data availability at BankFocus database, it became evident that data for loan loss provisions is only available from year 2012. Thus, the researcher's focus was on the period from 2012

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[56] The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.

[57] If only public banks had been included, it would have resulted in no observations for forward-looking model since all publicly listed entities in the EU are required to follow IFRS since 2005 (therefore the IAS 39 Incurred loss model).

to 2017. Initially, the sample included 5,282 banks but was significantly reduced to 680 banks after the deletion of banks with missing data. Consequently, the panel with raw data included 3,400 bank-year observations (2,687 and 713 banks following IFRS and Local GAAP respectively). Further normalisation of the data resulted in reduction of the sample. Hence, the final sample used in the analyses includes 570 EU banks or 2,850 bank-year observations (see Table 3.3 below).

Table 3.3: Sample selection details.

Detail	No. of banks	No. of bank-year observations[58]
Sample downloaded from BankFocus database	5,282	26,410
Deleted observations due to missing data	(4,602)	(23,010)
Raw data sample	680	3,400
Deleted observations due to data normalisation	(110)	(550)
Final sample for a time period 2012 – 2016	570	2,850

Note: Table 3.3 shows the process of sample reduction used in secondary data analysis. Source: Constructed by the author.

3.6.2 Secondary data methods of analysis

On the basis of existing literature in the area of loan loss provisioning as well as capital market research in accounting, the two quantitative methods were employed: (i) Ordinary Least Squares regressions and (ii) Fixed Effects panel regressions. The two methods are commonly used in the literature that examine loan loss provisioning. Gebhardt and Novotny-Farkas (2011) uses fixed effects panel regression analysis to examine how non-performing loans influence a bank's future provisioning behaviour, and Altamuro and Beatty (2010) use fixed effects panel regression analysis to evaluate how internal control

[58] The number of bank-year observations is derived by multiplying number of banks and number of years observed (5 years: 2012 – 2016).

regulation affects the actual loan losses reported by US insured depository institutions. In addition, the decision in favour of using the fixed effects regression model is based on the Hausman test which indicated the presence of endogenous variables in the panel data. Using the regression analysis, the study examines whether loan loss provisions recognised in one period are related to the actual loan losses reported in the next period. Loan loss provisions are expenses held in bank's equity in the case of loan default occurring in future accounting periods. However, given that early recognition of loan losses is favourable since it can reduce the pro-cyclicality in the financial system (FSF, 2009), this study examines the association between loan loss provisions and loan losses reported in the following period.

> *"Earlier recognition of loan losses could have dampened cyclical moves in the current crisis. Under the current accounting requirements of an incurred loss model, a provision for loan losses is recognised only when a loss impairment event or events have taken place that are likely to result in non-payment of a loan in the future. Identification of the loss event is a difficult and subjective process that results in a range of practice and, potentially, a failure to fully recognise existing credit losses earlier in the credit cycle. Earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness" (FSF, 2009: p. 4).*

The statement above by the Financial Stability Forum suggests that the relationship between LLP in one accounting period and the actual loan losses in the next period could discern which loan loss provisioning model results in superior LLP ability to predict actual loan losses. Thus, this study will specifically look at this relationship and will not extend the period of observation for actual losses. The following section discusses the accounting data that were used in the regression models.

3.6.3 Data

3.6.3.1 Gross charge off (GCO)

Used as a dependent variable in the regression analyses, gross charge-off of a bank represents the actual losses reported by the bank. This variable was available at BankFocus database quoted as *Gross Charge-Offs*. Upon its collection, this variable was first scaled by lagged total assets and multiplied by 100, and then natural logarithm of absolute value was found.

3.6.3.2 Loan loss provisions (LLP)

Used as an independent variable in the regression analyses, loan loss provisions represent recognised expenses for credit losses. This variable was available at BankFocus database quoted as *Loan Loss Provisions*. Upon its collection, this variable was first scaled by lagged total assets and multiplied by 100, and then natural logarithm of absolute value was found.

3.6.3.3 Model of loan loss provisioning (IFRS)

Used as an independent dummy variable in the regression analyses, this variable indicates which reporting model for loan loss provisioning the reporting entity has used. IFRS dummy is equal to '1' if a bank follows IAS 39 Incurred loss model and '0' if a bank follows local EU GAAP. This variable was available at BankFocus database quoted as *Accounting Standard.*

3.6.3.4 Audit specialisation (AUDIT)

Used as an independent dummy variable in the regression analyses, this variable indicates whether a bank is audited by one of the audit specialists in banking industry. *AUDIT* dummy is equal to one if a bank is audited by PricewaterhouseCoopers or KPMG, and zero otherwise. This variable was constructed based on two information collected from BankFocus database, namely (i) *Advisor Full Name,* and (ii) *Advisor Role.*

3.6.3.5 Bank size (SIZE)

Used as an independent variable in the regression analyses, this study uses total amount of assets as the proxy for bank size. This variable was available at BankFocus database quoted as *Total Assets.* Upon its collection, this variable was used in the form of its natural logarithm.

3.6.3.6 Banking sector credit risk (RANK)

Used as an independent variable in the regression analyses, this study uses variable *Banking Sector Risk* available at BankFocus database as a proxy for bank credit ranking. This variable has been constructed by the Economist Intelligence Unit and gauges the risk of a systemic crisis whereby bank(s) holding 10 per cent or more of total bank assets become insolvent and unable to discharge their obligations to depositors and/or creditors. It is encoded following the coding structure presented in Table 3.4 below. If there are two or more credit rankings attached to one bank for one year, a more conservative approach is used, and lower credit ranking is adopted.

3.6.3.7 Loan portfolio (LOA)

Used as a control variable in the regression analyses, a loan portfolio represents the total amount of performing loans held by a bank on its balance sheet. This variable was available from BankFocus database quoted as *Loans.* Upon its collection, this variable was first scaled by lagged total assets and multiplied by 100, and then natural logarithm of its absolute value was found.

Table 3.4: Codes associated with the banking sector risk.

EUI Score	EUI rating band	Description	Attached code
0-12	AAA	Capacity and commitment to honour obligations not in question under any foreseeable circumstances.	9
9-22	AA	Capacity and commitment to honour obligations not in question.	8
19-32	A	Capacity and commitment to honour obligations strong.	7
29-42	BBB	Capacity and commitment to honour obligations currently but somewhat susceptible to changes in economic climate.	6
39-52	BB	Capacity and commitment to honour obligations currently but susceptible to changes in economic climate.	5
49-62	B	Capacity and commitment to honour obligations currently but very susceptible to changes in economic climate.	4
59-72	CCC	Questionable capacity and commitment to honour obligations. Patchy payment record.	3
69-82	CC	Somewhat weak capacity and commitment to honour obligations. Patchy payment record. Likely to be in default on some obligations.	2
79-92	C	Weak capacity and commitment to honour obligations. Patchy payment record. Likely to be in default on significant amount of obligations.	1
89-100	D	Very weak capacity and commitment to honour obligations. Poor payment record. Currently in default on significant amount of obligations.	0

Note: Table 3.4 shows EIU score, rating bands, their respective description and the code assigned to assist empirical analysis.
Source: Constructed by the author using The Economist Intelligence Unit Credit Rating available at *http://www.countryriskanalysis.com/sites/default/files/EIU%20Credit%20Ratings%20explained.pdf.*

3.6.3.8 Non-performing loans (NPL)

Used as a control variable in the regression analyses, non-performing loans represent the total amount of loans classified as non-performing, that is loans with more than 90 days passed since the scheduled repayment of the agreed instalments or interest. This variable was available at the BankFocus database quoted as *Total impaired/Non-performing loans.* Upon its collection, this variable was first scaled by lagged total assets and multiplied by 100, and then natural logarithm of its absolute value was found.

3.7 Survey research

Creswell (1994) states that the choice of research methods should closely relate to the nature of the topic being studied. In line with the objectives of this thesis, survey research is adopted to further examine the attitudes, opinions and views of investors and academicians on the topic of loan loss provisioning. For the purpose of this study, survey questionnaire is utilised that promotes explanatory nature of this study. By collecting primary data via questionnaires, the study aims to supplement the initial findings from the secondary data and further examine and explain the relationships between relevant variables. As Bloomfield, Nelson and Soltes (2016: p. 377) states:

> *"[b]ecause survey respondents typically provide data about their naturally arising practice setting, surveys offer a great opportunity for contextualization, generating rich descriptive data about practitioners' beliefs and preferences and illuminating previously hypothesized facts and associations that offer opportunity for theory building".*

While the purpose of this study is not to build a new theory, it aims to augment secondary data analysis with information that is not available by other means, using responses collected from questionnaires that are then analysed using conventional statistical methods. In other words, survey research may enhance understanding of the incidence of a particular phenomenon and the form and strength of a conceptual relationship observed in secondary data analysis (Modell, 2005). In the context of this thesis, this study aims to establish whether the findings emerging from secondary data analyses could be supported by those from primary analyses. The combination of the two sources of data (primary quantitative and secondary quantitative and qualitative data), so-called triangulation technique[59] provides advantage to the research by generating "a more complete, holistic and contextual portrait of the object under the study" (Ghauri, Gronhaug and Kristianslund, 1995: p. 94).

The use of survey research focuses on two interest groups: (i) financial analysts and (ii) finance and accounting academicians. Financial analysts are directly involved in the equity valuation of banks and other financial institutions, and they often provide guidance to businesses and individuals making investment decisions. In addition, this study aims to survey academicians since they often form a part of advisory boards of accounting standard setters such as IASB and FASB. Financial analysts and academicians are considered to be the most suitable candidates as they should be able to provide further insights into the research objectives. Since the topic of expected loss model for

[59] Triangulation represents a research technique that can enhance data validity through cross-verification facilitated by multiple sources. There are four types of triangulation techniques: (i) methods; (ii) data/sources; (iii) investigator; and (iv) theory triangulation (Denzin, 1978; Ryan, Scapens and Theobold, 2009). Methods triangulation refers to a combination of two or more methods of data collection to enhance consistency of the findings. It is often accomplished by the combination of quantitative and qualitative data to elucidate complementary insights on the same aspect(s). Data/sources triangulation refers to a combination of two or more data sources to examine the consistency of findings within the same method. For example, it can be accomplished by combining primary and secondary data that are then used to examine using quantitative methods. Investigator triangulation is a collaborative strategy, in which multiple researchers' input is combined to illuminate "blind spots in an interpretative analysis" (Honorene, 2016: pp. 91 – 92). It is not the aim of this technique to seek consensus, but rather to introduce multiple perspectives of knowledge. Theory triangulation uses multiple theoretical perspectives to derive hypotheses and to examine and interpret the data. This type of triangulation is primarily used when there is a need to provide further insights into less conclusive findings (Erzberger and Prein, 1997).

determination of loan loss provisions is a relatively new area of research with no ex post data[60], it is vital to complement the secondary ex ante data with primary data.

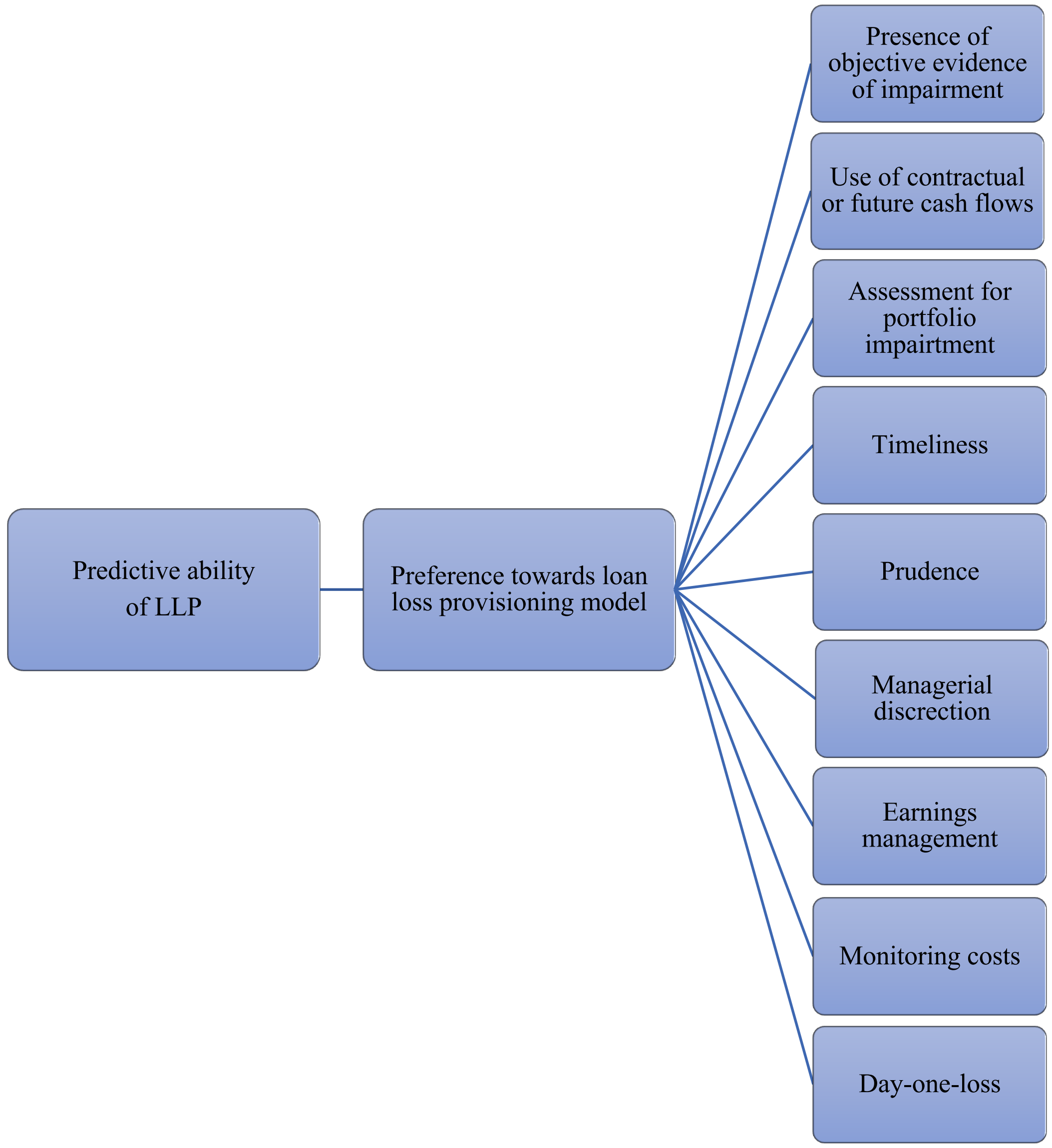
Survey research is a well-established method of enquiry in a wide range of social sciences research. This thesis adopts a quantitative survey questionnaire that generates numerical data and, in comparison to qualitative survey[61], it includes closed-ended question with predetermined choices of answers. The survey questionnaire is closely guided by the research questions that typically suggest a necessary list of the variables, both dependent and independent, which the survey questionnaire will need to measure. In line with Punch (2003), this study proceeds with the conceptual definition of the questionnaire and its variables. This is vital not only for the construction stage, but also in data analysis and interpretation of results (Punch, 2003).

Since this study is interested in the relationship between the predictive ability of loan loss provisions and a loan loss provisioning model, the dependent variable, the predictive ability of LLP, is defined as participants' preference towards a particular model. This is based on the grounds that the interest groups prefer the model that improves the ability to communicate accounting information to relevant stakeholders, which is essential for a variety of decision-making purposes (such as equity valuation). Chenhall and Jachau (1977) find that investors place financial statements as the most important source of information when making investment decisions[62]. As Chenhall and Jachau (1977: p. 117)

[60] Expected loss model prescribed by IFRS 9 came into effect on January 2018.
[61] Qualitative surveys typically include open-ended questions that respondents answer to using words, which are subsequently processed and analysed without transforming the words into numerical data.
[62] Chenhall and Jachau (1977) report the following information sources for investment decision-making, from the most to least important: (1) financial statements (30 per cent); (2) stockbrokers (28 per cent); (3) newspapers and magazines (17 per cent); (4) other tips and rumours (15 per cent); (5) advisory services (7 per cent); and (6) friends and relatives (3 per cent).

conclude “it is accepted that the role of financial statements retains significance when it is realised that other information sources used by investors would resort to analysis of financial statement together with other economic a capital market information.” Furthermore, independent variables are defined as follows: (i) presence of objective evidence of impairment; (ii) use of contractual or expected future cash flows in determination of interest income through effective interest rate; (iii) assessment for portfolio impairment; (iv) timeliness of recognition of loan losses; (v) prudence of recognition of loan losses; (vi) level of managerial discretion exercised; (vii) level of earnings management activity; (viii) monitoring cost of credit risk; and (ix) presence of day-one-loss provisioning. These factors have been discussed in the literature review chapter and appear to be fundamentally related to loan loss provisioning. Figure 3.2 below depicts the conceptual framework used to construct the questionnaire for this study.

Figure 3.2: Conceptual Framework – Survey questionnaire.



Note: Figure 3.2 shows the conceptual framework used to construct survey questionnaire as part of the primary data collection.
Source: Constructed by the author.

When developing a questionnaire, a scale of measurement for each variable should be clearly established. This can vary depending on the variable, for example categorical variable such as gender, one clearly worded item will suffice, whereas continuous variables need to be measured on the scale. The questionnaire of this study combines the two measurement types, however, measurement on the scale prevails in a form of the Likert scale.

The questionnaire used to collect primary data for this study is attached in Appendix 1. The questionnaire is divided into four sections. The first section consists of six questions, which focus on background information about the respondents, for example, job title, age, gender and education. This section also seeks to extract details about the respondents' experience in providing guidance to clients making investment decisions. Section B contains four questions centred around the elements of loan loss provisioning. In other words, it examines the views of respondents towards their preferred model of loan loss provisioning by investigating the key elements of loan loss recognition. Sections C and D consist of six questions that target aspects of incurred- and expected loss model respectively. Specifically, these sections explore perspectives of respondents on the effect of each model on different proxies of quality of accounting information such as timeliness and earnings management. The majority of questions in Sections B, C and D adopt the Likert scale measurement system with five categories of available responses[63]. The Likert scale is a research measurement tool typically used in questionnaires (Subedi, 2016). It is designed to measure individual's attitudes, opinions and perceptions in relation to a specific construct. The categories included as part of the Likert scale are then numerically coded to enable quantitative analysis once the data collection is completed. Although it is common to treat Likert scale category's observations as interval level data, it is preferable to consider such data as ordinal, as Brill (2008) argue:

[63] Five categories of responses include: strongly agree; agree; neither/do not know; disagree; and strongly disagree.

> *"the assumption that all respondents perceive differences between adjacent levels as equidistant is a tenuous one, particularly when smaller number of response choices are involved. When treated as ordinal data, Likert item results can be analysed using nonparametric test or chi-square tests of association."*

At the same time, it is important to be aware of some of the biases that may be involved in relation to the Likert scale measurement system. Response distortion may occur when respondents prefer not to choose extreme response categories (strongly agree/strongly disagree). This may result in central tendency bias when most of the answers are located in the middle of a rating scale (neither/do not know). Furthermore, acquiescence bias may ensue when respondents decide to choose the response that they believe is the most suitable or appropriate answer. Whilst the acquiescence bias may not pose significant risk given that this study does not entail any social desirability elements, there may be an incidence of central tendency bias, in particular, when respondents do not have necessary knowledge or experience with credit risk reporting and the two models involved.

In addition to questions adopting the Likert scale measurement, Sections C and D include one open-ended question each which seeks to extract further information about the elements of loan loss provisioning models which may be considered detrimental in effective evaluation of credit risk. The questionnaire includes these two investigative questions since the literature has identified some other factors which could also hinder credit risk assessment, and which are not explicitly tested in the questionnaire. The data generated by open-ended questions are anticipated to provide more insights into quantitative results generated by the statistical analyses. Also, is it expected that qualitative data may provide further links to extant literature that may improve overall interpretation of the results.

3.7.1 Validity of survey questionnaire

According to Saunders, Lewis and Thornhill (2009), internal validity in relation to questionnaires relates to the ability of a questionnaire to measure what it was designed to measure. In other words, internal validity is concerned with assessing whether the findings generated by a questionnaire actually represent the reality of subject studied. One of the possible ways to get around this problem would be looking at other relevant evidence that could support the questionnaire results. In relation to this study, the primary data are supported by the results generated from secondary sources so that internal validity can be judged.

When discussing questionnaire validity, a researcher should be aware of different kinds of validity, namely, content validity, criterion-related validity and construct validity. Content validity refers to the extent to which a measurement tool (a questionnaire) covers all aspects of a given construct (research topic). To ensure content validity of the questionnaire used in this study, the questionnaire has been constructed on the basis of literature reviewed in Chapter Two and the research question stated in Chapter One. In addition, the inclusion of the two open-ended questions, discussed in the previous section, ensures that any appropriate facts that are not explicitly included in the questionnaire can still be identified. Criterion-related validity or predictive ability is concerned with the ability of the questions included in a questionnaire to predict an outcome. In case of this thesis questionnaire, it refers to how well independent variables can predict the preference towards a particular loan loss provisioning model. That is, how relevant the aspects identified as part of the questionnaire conceptual framework, are for the concerned parties of financial analysts and academicians when determining a preferred form of loan loss recognition. Again, these aspects are supported by practitioners' and academic literature.

Lavrakas (2008: p. 135) defines construct validity as "the issue of how well whatever is purported to be measured actually has been measured." To improve construct validity, a researcher should refer to different survey variables such as wording, formatting and the location of questions within the questionnaire to gather data on a particular construct. In addition, researcher should also be aware of how questionnaire is administered and the respondents themselves. In relation to this thesis' questionnaire and in order to enhance construct validity, online invitations are distributed to financial analysts registered in the CFA Institute Directory[64]. It is expected that financial analysts holding CFA status are at least theoretically aware of loan loss provisioning, its effects on banks' balance sheet and subsequent implications for equity valuation. Also, accounting and finance academics working at EU colleges and universities, in particular those with financial accounting expertise, are likely to understand the topic of loan loss provisioning. Therefore, when sending out online invitations to academics, the researcher closely targets those working in accounting, finance and banking research groups or departments. This information is publicly available on the universities' websites. In addition, to separate between those with theoretical knowledge and those with practical experience, the questionnaire also includes two questions (in Section A) seeking details about participant's experience in working in financial services or wealth management, and involvement in provision of investment advice. Furthermore, a brief video presentation is included as part of introductory page in the questionnaire, which aims to provide basic information about loan loss provisioning and the two respective models. The purpose of this video is to ensure that only participants with relevant knowledge or experience complete the

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[64] CFA Institute is a non-profit global organisation that offers certification programmes for investment professional. It is formerly known as the Association for Investment Management and Research (AIMR), the CFA Institute has currently over 70,000 members across the globe that hold the Chartered Financial Analyst qualification. The CFA Directory can be publicly accessed via the following link: https://www.cfainstitute.org/community/membership/directory/Pages/index.aspx#section-1.

questionnaire. The questionnaires are self-administered using the UCL *Opinio* web-based survey tool[65]. The questionnaire proforma is attached in Appendix 1.

3.7.2 Reliability of survey questionnaire

Reliability refers to consistency of results, whether or not these results are valid. Hence a questionnaire can be reliable, but not valid. In other words, it can generate consistent findings, however, these results are only limitedly applicable for an interpretation of construct intended to be measured. Thus, it is vital that a questionnaire is both reliable and valid (see discussion in the previous Section 3.7.1).

> *"Reliability is therefore concerned with the robustness of your questionnaire and, in particular, whether or not it will produce consistent findings at different times and under different conditions, such as with different samples or, in the case of an interviewer-administered questionnaire, with different interviewers" (Saunders, Lewis and Thornhill, 2009: p. 373).*

In general, there are three types of reliability tests: (i) test re-test; (ii) internal consistency and (iii) alternative form. Test re-test reliability refers to "a statistical technique used to estimate components of measurement error by repeating the measurement process on the same subjects, under conditions as similar as possible, and comparing the observations" (Feder, 2008: p. 889). In this context, reliability is the precision of the measurement employed without considerations over the validity of such measurement system. In relation to a survey questionnaire, test re-rest reliability can be checked if a questionnaire is administered on multiple occasions (this is typically twice) and the responses collected are then compared. This test may generate a rather imprecise result since it requires re-recreation of the same conditions on the following occasions of data collection – the

[65] Survey questionnaire can be accessed using the following link: https://opinio.ucl.ac.uk/s?s=59810.

longer the time period between the data collection events, the lower the likelihood of consistent responses and thus reliability. Therefore, Saunders, Lewis and Thornhill (2009) suggest that this reliability test is only to be used as a supplement to other techniques.

Internal consistency reliability refers to the consistency of responses to each question in the questionnaire with those to other questions measuring the same construct and testing whether different questions deliver consistent results. There are number of methods that can be used to calculate internal consistency reliability, with the most popular being Cronbach's alpha.

> *"Cronbach's alpha is a statistic that measures the internal consistency among a set of survey items that (a) a researcher believes all measure the same construct, (b) are therefore correlated with each other, and (c) thus could be formed into some type of scale" (Trobia, 2008: p. 170).*

Cronbach's alpha is constructed under the assumption that there are multiple questions measuring the same construct. Thus, Cronbach's alpha essentially tests whether a respondent answers in a similar manner on questions measuring the same element. The value of Cronbach's alpha can range between 0 and 1 but can theoretically also be negative. This could arise when scores for some items are not in the same order. In general, the greater the Cronbach's alpha, the more coherent the scale, which results in greater reliability. According to Trobia (2008), the critical value of Cronbach's alpha is 0.70, above which a researcher can assume sufficient reliability of the scale employed[66]. Given that the Cronbach's alpha rises as the number of items included in the scale

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[66] When the Cronbach's alpha is 0.70 (or more), 50 per cent (or more) of the variance is distributed among the questions being considered to be scaled together.

increase, it is often a practice to expand the scale in order to improve the value of Cronbach's alpha. This practice is however broadly criticised as overly large-scale may disturb some respondents and lead to burden effects such as yes-saying, false opinion, or response set. It is noteworthy that while low Cronbach's alpha indicates an underlying problem with measuring a construct, high Cronbach's alpha can also entail an issue. High Cronbach's alpha can be associated with multidimensional structure of the scale – that is measuring more than one construct. It is therefore recommended to test for unidimensionality of the scale using factor analysis before calculating Cronbach's alpha. If more than one subset is identified, Cronbach alpha should be computed for each subset separately. Thus, factor analysis should be part of reliability testing when using Cronbach's alpha, in particular, when high Cronbach's alpha is reported. When testing reliability using Cronbach' alpha, one should also be aware of the paradox of alpha as it approaches its maximum value of 1.00.

> *"Where a scale to have an alpha of 1.00, that would mean that all items composing that scale are perfectly correlated with each other. It also would mean that any one of the items would measure the construct as well as any other of the items, and also that any one item would measure the construct as well as the entire multi-item scale" (Trobia, 2008: p. 170).*

Trobia (2008) suggests that when Cronbach's alpha exceeds value of 0.90, a researcher should carefully judge whether all the items intended to measure a given construct should be included.

The last test of reliability – alternative form measures consistency of results generated by two different versions of the same test completed at different times. An issue associated with this test can arise when constructing the two version of the same test – it may be difficult to design/create questions that are substantially the same. Also, similar to test re-test technique, participants may not be willing to complete two sets of questionnaires.

3.7.3 Pilot testing of survey questionnaire

Prior to distribution of survey questionnaire and collection of data, the questionnaire should be pilot tested. The primary aim of pilot testing is to ensure the validity of questions being asked in relation to the construct measured, and the reliability of the results generated by the questionnaire. It is also beneficial to facilitate further necessary adjustments so that respondents fully understand the questions and have no issues recording the data, for example technical issues if delivered online.

The questionnaire of this study has been pilot tested during the period from September 2018 until December 2018. In total, during the pilot testing, seventy-seven (77) responses were collected, out of which thirty (30) responses were complete. In line with the target population, the pilot questionnaire was distributed amongst the financial analysts registered at CFA Institute Directory and accounting and finance academicians working at colleges and universities in the European Union.

As part of the pilot testing, several comments were received from academics that provided relevant insights into potential improvements to the questionnaire. In addition, reliability testing has been conducted in the form of Cronbach's alpha; these results are reported in Table 3.5 below.

Table 3.5: Results of reliability testing of questionnaire pilot stage.

Construct No.	Construct Name	Cronbach's Alpha Value
1	Design of loan loss provisioning	0.525
2	IAS 39 Incurred loss model	0.879
3	IFRS 9 Expected loss model	0.829

Note: Table 3.5 shows the Cronbach's alpha values for the three constructs identified in the pilot questionnaire.
Source: Constructed by the author.

The pilot questionnaire consisted of three distinct constructs: (1) Design of loan loss provisioning; (2) IAS 39 Incurred loss model; and (3) IFRS 9 Expected loss model that reported the values of Cronbach's alpha as 0.525; 0.879 and 0.829 respectively. Given that construct (2) and (3) reported Cronbach's alphas greater than 0.70, it was established that sufficient reliability had been achieved for these two constructs; therefore, no changes were made. However, construct (1) reported a value of Cronbach's alpha of 0.525, which has been examined further. It was documented that by omitting one of the questions in construct (1), Cronbach's alpha would increase to 0.640. However, it was established that this question is very important within the construct and therefore it was decided that the question should be kept and only rephrased since many of the responses were 'neither/do not know'. This could have indicated that participants had not fully comprehended the question, which resulted in central tendency bias. In addition, the comments from pilot participants were put into use before the final collection of data. For example, suggestions were put in relation to educational qualification (professional qualification option was added), gender fluidity and open-ended questions.

3.7.4 Ethical considerations

In the first part, the secondary research methodology relies on publicly available data accessible on the financial databases from public domains. Therefore, the use of secondary data does not entail the ethical issues typically experienced with methodologies that involve human participants. That said, in the second part of the research design, the survey questionnaire methodology is concerned with the approval of the University of Buckingham Ethics Committee since it involves human participants. In order to fulfil the ethical guidelines of the University of Buckingham Business School, this study has ensured and monitored throughout the research process that:

- All participating individuals have received full details about the motives of this research.
- All participants have provided a permission to be part of this study in the form of a consent confirmed by clicking ‘agree’ button on the first page of the online questionnaire.
- All participants have had the right to withdraw from the research at any time.
- All human participants will be provided with the feedback on the results of the primary research if requested at the time of submitting their online questionnaire responses.
- Both confidentiality and anonymity of all participants have been guaranteed by:
    - Participants completing the questionnaire online,
    - All data collected via questionnaires have been kept on the University of Buckingham servers and kept under password protected folder, and
    - The data will be destroyed seven years after the completion of this study.

In line with the Buckingham Business School’s Ethics Code of Practice, this research has been approved by the Buckingham Business School Ethics Committee (see Appendix 2).

3.8 Conclusion

This chapter has presented the research philosophy adopted in this thesis and the research methods used to investigate the predictive ability of loan loss provisioning models. More specifically, the purpose of this chapter has been to discuss the research paradigms used in social research and discuss and justify their suitability for this research with regards to the researcher's views about the reality and knowledge. In addition, the research methods using both primary and secondary data are discussed and commented upon considering relevant aspects. The results of secondary data analysis are discussed in the next chapter while the results from primary data are presented in Chapter 5 of this thesis.

Chapter 4 Secondary Data Analysis

4.1 Introduction

The purpose of this chapter is to examine the hypotheses stated in Section 1.5. In particular, this chapter presents the results about the predictive ability of loan loss accounting models, that is between the incurred loss model and the expected loss model. The empirical quantitative analysis is based on the accounting data for 570 public and private EU banks over the time period from 2012 to 2016. Descriptive statistics, Spearman's correlation and fixed-effect regression analyses are employed to ascertain whether the banks reporting under EU local GAAP (a proxy for the expected loss model) exhibit superior predictive ability of loan loss provisions relative to banks reporting in accordance with IAS 39 Incurred loss model. Further examinations establish whether and how bank's size, auditor and credit rating influence the predictive ability of loan loss provisions to estimate future loan losses.

The remainder of this chapter is structured as follows. Section 4.2 presents the descriptive statistics of dependent, independent and control variables, and discusses the preliminary analysis. Section 4.3 establishes the regression models used in testing the objectives of this study, presents and discusses the results in relation to extant theoretical and empirical evidence. Finally, Section 4.4 concludes the chapter.

4.2 Descriptive statistics

The final sample selected for the secondary data analysis contains 570 private and public EU banks with total of 2,850 bank-year observations over the 5-year period from 2012 until 2016. Table 3.3 in Section 3.6.1 presents details about the sample reduction process.

Descriptive statistics contain information about the variables' number of observations (N), mean, standard deviation, minimum value and maximum value. In addition, the skewness, which measures the degree of distortion from a normal distribution in a set of data, and kurtosis, which indicates how the tails of the distribution differ from the tails of a normal distribution, are presented for each variable collected for secondary data analysis. The descriptive statistics are reported in Table 4.1 and Table 4.2. Table 4.1 below shows descriptive statistics using raw data for the sample of all banks combined (Panel A), and for the two sub-groups of banks according to the accounting standards they follow and thus, the loan loss accounting rules they apply (Panel B and Panel C). Table 4.2 shows descriptive statistics using normalised data for all the banks combined.

A visual examination of Table 4.1: Panel A below provides a number of interesting points. The dependent variable gross charge-off varies between 0 and 24,547,951 thousand USD. On average, it can be observed that banks have written-off 207,218 thousand USD from their loan portfolio each year during the period from 2012 to 2016. The independent variable, loan loss provisions, ranges from -2,128,931 to 24,473,550 thousand USD. The negative figures are reported for some bank-year observations, which indicate that the change-offs were greater than the available provisions held on reserves, which could have been due to underestimation of credit risk or unexpected fall in loan portfolio value. The mean value shows that banks have provided in average 238,298 thousand USD for potential credit losses each year during the period from 2012 to 2016.

The independent dummy variable IFRS takes only two values (0 or 1) and reports the mean of 0.790 which indicates that the sample contains a majority of banks following IFRS, that is, IAS 39 Incurred loss model for determination of loan loss provisions.

Similarly, independent dummy variable audit specialisation reports a mean value of 0.506, which suggests that the sample is relatively balanced in terms of banks audited by the industry specialist[67] and those that are not audited by the industry specialist. Another independent variable, banking sector risk, ranges from 3 to 8, which indicates that no banks with rating AAA, CC, C and D are included in the sample. The average banking sector risk rating is 6.253, which corresponds to approximately BBB band in accordance with the Economist Intelligence Unit adopted in this study. The independent variable bank size ranges from 18,570 to 2,692,538,000 thousand USD, with the average value of total assets being 71,009,789 thousand USD. Furthermore, the non-performing loans vary between 0 and 107,422,172 thousand USD, and total loans vary between 0 and 992,169,000 thousand USD. On average, the value of banks' non-performing loans portfolio and total loan portfolio is equal to 1,975,852 and 32,376,287 thousand USD respectively.

Upon initial perusal of Table 4.1: Panel B and C below, it becomes evident that the sub-sample of banks reporting in accordance with IFRS is larger than the sub-sample of banks reporting in accordance with Local GAAP. There are 2,687 and 713 bank-year observations in IFRS and Local GAAP sub-group respectively. By observing the mean values, all variables in IFRS sub-group (except the nominal variables *PWCKPMG* and *RANK*) are greater than those in Local GAAP sub-group. This is the most significant in relation to the average size of a bank, that is 2,692,538,000 and 132,972,147 thousand USD for the IFRS and Local GAAP sub-group respectively. In addition, it can be observed that IFRS banks provide more in terms of loan loss provisions, a mean value of

[67] PWC and KPMG have been considered as auditors with banking industry specialisation.

285,560 thousand USD, than Local GAAP banks with a mean value of 60,188 thousand USD. This overall observation is further supported by the evidence that average size of IFRS banks' loan portfolio is significantly greater in comparison with local GAAP banks, 39,570,529 and 5,264,185 thousand USD respectively.

Table 4.1: Descriptive statistics of raw data.

Panel A: Descriptive statistics of all banks combined.

Variable	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**	**Kurtosis**
GCO	3400	0	24,547,951	207,218	1,219,618	11.029	153.231
LLP	3400	-2,128,931	24,473,550	238,298	1,180,988	10.770	158.019
IFRS	3400	0	1.000	0.790	0.407	-1.427	0.036
SIZE	3400	18,570	2,692,538,000	71,009,789	269,142,717	5.941	40.150
PWCKPMG	3400	0	1	0.506	0.500	-0.024	-2.001
RANK	3400	3	8	6.253	0.698	-0.963	3.350
LOA	3400	0	992,169,000	32,376,287	108,384,960	5.386	32.956
NPL	3400	0	107,422,172	1,975,852	7,821,217	6.885	57.627

(continued on the next page)

Panel B: Descriptive statistics of banks reporting in accordance with IFRS.

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
GCO	2687	0	24,547,951	260,014	1,367,088	9.796	120.767
LLP	2687	-2,128,931	24,473,550	285,560	1,316,211	9.727	127.704
SIZE	2687	18,570	2,692,538,000	87,935,882	300,383,247	5.242	31.005
PWCKPMG	2687	0	1	0.525	0.499	-0.102	-1.991
RANK	2687	3	8	6.114	0.672	-1.037	4.243
LOA	2687	0	992,169,000	39,570,529	120,732,131	4.756	25.407
NPL	2687	0	107,422,172	2,463,373	8,732,655	6.096	45.005

(continued on the next page)

Panel C: Descriptive statistics of banks reporting in accordance with local GAAP.

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
GCO	713	0	161,550	8,252	18,726	4.254	21.540
LLP	713	-301,105	2,633,241	60,188	287,422	6.376	42.648
SIZE	713	26,565	132,972,147	7,222,394	16,213,568	5.334	31.949
PWCKPMG	713	0	1	0.432	0.496	0.275	-1.930
RANK	713	3	8	6.777	0.521	-1.586	6.478
LOA	713	1,024	128,264,973	5,264,185	12,658,949	5.898	41.487
NPL	713	0	4,022,664	138,590	248,316	7.350	90.492

Note: Table 4.1 reports descriptive statistics of dependent, independent and control variables using raw data.
Panel A reports descriptive statistics for all the banks combined.
Panel B reports descriptive statistics for the sub-sample of banks following IFRS.
Panel C reports descriptive statistics for the sub-sample of banks following local GAAP.
Variables *GCO*, *LLP*, *SIZE*, *LOA* and *NPL* are presented in thousand USD. Variable *PWCKPMG* is the dummy variable, and variable *RANK* is a discrete variable.

Table 4.2: Descriptive statistics using normalised data (all banks).

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
GCO	2850	0.000	2.071	0.092	0.141	3.337	20.888
LLP	2850	0.000	1.527	0.194	0.188	2.092	8.130
IFRS	2850	0	1	0.826	0.379	-1.724	0.972
SIZE	2850	9.829	21.714	15.231	2.441	0.541	-0.349
PWCKPMG	2850	0	1	0.51	0.500	-0.021	-2.001
RANK	2850	3	8	6.24	0.714	-0.950	3.278
LOA	2850	0.014	3.242	1.750	0.217	-3.043	18.079
NPL	2850	0.000	1.765	0.730	0.366	-0.142	-0.791

Note: Table 4.2 reports descriptive statistics of dependent, independent and control variables using normalised data for all the banks combined. Variables *GCO*, *LLP*, SIZE, *LOA* and *NPL* are presented as natural logarithm of variables described in Section 3.6. Variable *PWCKPMG* is the dummy variable, and variable *RANK* is a discrete variable as described in Section 3.6.

According to Ghasemi and Zahediasl (2012), statistical errors are common in empirical literature with about 50 per cent of publications having at least one error. The parametric test and procedures such as correlations, *t*-tests or regression analyses are all based upon the assumption that a data set follows a normal distribution or a Gaussian distribution. In other words, the parametric tests assume that the populations from which the samples are drawn are normally distributed. However, Ghasemi and Zahdiasl (2012: p. 486) further outlines that with sufficiently large sample sizes (over 40 observations), "the violation of the normality assumption should not cause any major problems". Therefore, the use of parametric tests can be adopted despite the data not being normally distributed. With reference to the central limit theorem, in large samples (over 40 observations), the sampling distribution tends to be normal, regardless of the shape of the data (Field, 2009; Elliott and Woodward, 2007).

As part of the descriptive statistics, the test of normality is conducted; in particular the Kolmogorov-Smirnov and the Shapiro-Wilk tests are performed to assess the normality of the current study data set. In general normality tests "compare the scores in the sample to a normally distributed set of scores with the same means and standard deviation" (Ghasemi and Zahdiasl, 2012: p. 487). The null hypothesis of the test is stated as follows: 'The sample distribution is normal'. Therefore, if the tests report significant *p*-values, the null hypothesis statement is rejected and thus the sample distribution is non-normal. Ghasemi and Zahdiasl (2012) states that in cases of large sample sizes, the rejection of null hypothesis is often reported even despite a small deviation from normality, which does not present any significant problems in conducting parametric tests. "The Kolmogorov-Smirnov test is an empirical distribution function in which the theoretical cumulative distribution function of the test distribution is contrasted with the empirical distribution function of the data" (Ghasemi and Zahdiasl, 2012: p. 487). The major problem with the Kolmogorov-Smirnov test is its high sensitivity to extreme values and outliers (Peat and Barton, 2005). The Shapiro-Wilk Test is based on the correlation between the data set and the corresponding normal scores, and according to Steinskog, Tjøstheim and Kvamstø (2007), it provides superior power to predict normality than the Kolmogorov-Smirnov test. Therefore, the researcher decided to conduct both normality tests. The results (not tabulated) of both tests report statistically significant *p*-values at 1 per cent two-tailed test, which supports the rejection of the null hypothesis. Thus, the conclusion is that the data set is not normally distributed. Despite the findings, the argument by Ghasemi and Zahdiasl (2012) is embraced that with large samples sizes, the violation of normality assumption does not present major problems into conducting parametric tests.

Table 4.3 below presents the correlation results between the variables used in secondary data analyses. Correlation is a bivariate analysis that measures the strength association between variables and the direction of this relationship (negative or positive). The correlation coefficient could vary between -1.00 and 1.00 with the two extreme values indicating the perfect negative and positive correlation respectively. As the correlation coefficient approaches 0, the relationship becomes weaker. Table 4.3 below shows

Spearman's correlation coefficients[68] since the only assumption is that the data must be at least ordinal and the scores on one variable must be monotonically related to the other variable. A visual examination of Table 4.3 below provides a number of interesting points. First, there is a positive correlation between gross charge-offs (*GCO*) and loan loss provisions (*LLP*) at 1 per cent statistical significance (correlation coefficient 0.298). This has been predicted since gross charge-offs strongly depend on the estimation of credit risk represented by loan loss provisions; in other words, greater allowance for credit losses suggests greater risk of default and thus potential charge-off in the following year. Another observation that was predicted is the strong positive association between the size of a bank (*SIZE*), and gross charge-offs (*GCO*) (correlation coefficient 0.051). It is reasonable to expect that the larger the bank, the greater is the loan portfolio and thus the actual loan losses which may be incurred. Interestingly, a significant negative correlation exists between bank's total assets (*SIZE*) and loan loss provisions (*LLP*) (correlation coefficient -0.206), which suggests that the larger the bank, the smaller loan loss provisions.

There is also a significant positive correlation between dummy variable *PWCKPMG* and dummy variable *IFRS* (correlation coefficient 0.130), which could indicate that banks audited by one of the industry specialists are more likely to use the IAS 39 Incurred loss

[68] There are several types of correlations measures. The most popular are Pearson correlation, Kendall rank correlation, and Spearman correlation. The Pearson correlation is typically used for variables that are normally distributed. The other assumptions of the Pearson correlation include linearity, which suggest existence of a linear relationship between the two variables, and heteroscedasticity, which refers to inequality of variability between the values of two variables. Spearman correlation is a non-parametric correlation measure, which requires the two variables to be either ordinal, interval or ratio (Schober, 2018). It is often used to measure the strength of correlation direction of the monotonic relationship rather than linear relationship as in case of Pearson correlation. Kendall rank correlation is also nonparametric measure of correlation and considered as an alternative to Spearman correlation, in particular, when the testing involves using small sample size with many tied ranks.

model prescribed by IFRS. This is supported by the evidence from Khlif and Achek (2016) which documents that IFRS adoption has an effect on audit market through auditor choice and audit market concentration. In addition, a significant positive correlation exists between *PWCKPMG* and *SIZE* (correlation coefficient 0.291), which could suggest that larger banks tend to be audited by industry specialists. Further interesting observations can be made in relation to the correlations between *GCO* and *RANK*, and between *GCO* and *LLP* (significant negative correlations coefficients -0.179 and -0.384 respectively). These findings could indicate that banks with superior credit ratings as measured by the EIU Banking Sector Risk, write-off more in terms of actual loan losses represented by gross charge-offs.

Table 4.3: Spearman's correlation matrix for all variables.

Variable	GCO	LLP	IFRS	SIZE	PWCKPMG	RANK	LOA	NPL
GCO	1.000							
LLP	**0.298****	1.000						
IFRS	**0.069****	**0.229****	1.000					
SIZE	**0.051****	**-0.206****	-0.023	1.000				
PWCKPMG	**0.114****	0.027	**0.130****	**0.291****	1.000			
RANK	**-0.179****	**-0.384****	**-0.475****	**0.296****	-0.015	1.000		
LOA	**0.046***	**0.045***	**-0.291****	**0.038***	**-0.038***	**0.146****	1.000	
NPL	**0.323****	**0.686****	**0.247****	**-0.359****	**-0.101****	**-0.488****	**0.122****	1.000

*Note: Table 4.3 reports Spearman's correlation coefficients between dependent and independent variables using the sample of all banks combined. *, ** indicate statistical significance at 5 and 1 per cent, respectively.*

In terms of control variables, it can be observed that there is a significant positive correlation between non-performing loans (*NPL*) and loan loss provisions (*LLP*), and between non-performing loans (*NPL*) and gross charge-offs (*GCO*) (correlation coefficients 0.686 and 0.323 respectively). These observations were predicted based on the assumption that a bank with large amount of non-performing loans on balance sheet naturally experiences greater likelihood of credit default and thus is expected to provide more for potential credit losses and write-off more in terms of actual loan losses. Similar reasoning can be applied to the observed significant positive correlation between loan portfolio (*LOA*) and gross charge-offs (*GCO*), and between loan portfolio (*LOA*) and loan loss provisions (*LLP*) (correlation coefficients 0.046 and 0.045 respectively). Interestingly, a significant negative correlation is reported between bank's loan portfolios (*LOA*) and *IFRS*, (correlation coefficient -0.291) which may indicate that banks following the IAS 39 Incurred loss model have smaller loan portfolios. However, these banks do tend to have a larger portfolio of non-performing loans (NPL) (correlation coefficient 0.247). Furthermore, there is a strong positive correlation between bank's size (*SIZE*) and value of loan portfolio (*LOA*) (correlation coefficient 0.038), and also a strong negative correlation between bank's size (*SIZE*) and non-performing loans (*NPL*) (correlation coefficient -0.359). These findings suggest that the larger the bank, the larger its loan portfolio but the smaller its portfolio of non-performing loans. This is supported by the evidence from Kuzucu and Kuzucu (2019) that document the key determinant affecting non-performing loans in both emerging and advanced economies is real GDP growth.

The fact whether a bank is audited by an industry specialist (*PWCKPMG*) is negatively correlated with both bank's size of loan portfolio (*LOA*) and non-performing loans (*NPL*) (correlation coefficients -0.038 and -0.101 respectively), which indicates that banks audited by either KPMG or PWC have smaller loan and non-performing loans portfolios. Lastly, bank's credit rating (*RANK*) is positively correlated with size of its loan portfolio (*LOA*) but negatively correlated with non-performing loans (*NPL*) (correlation coefficients 0.146 and -0.488 respectively).

4.3 Data analyses

The choice of the models selected in secondary data analysis originates from the studies by Marton and Runesson (2017) and Altamuro and Beatty (2010). The objective of this thesis is to evaluate the predictive ability of loan loss provisioning models (IAS 39 Incurred loss model versus IFRS 9 Expected loss model). The predictive ability of loan loss provisions is defined as the capacity of loan loss provision recognised in year *t* to approximate actual credit losses written off from the loan portfolio balance in subsequent year(s). In line with Marton and Runesson (2017), the actual credit losses are represented by gross charge-offs – this is total amount of credit losses incurred by banks during a specific time period. Gross charge-offs are often compared to net charge-offs, which is the difference between gross charge-offs and any subsequent recoveries of credit already written off to non-performing loans. Since Khieu, Mullineaux and Yi (2012) provide evidence that loan characteristics, industry and macroeconomic conditions are significant factors influencing banks' recovery rates, this study adopts gross charge-off as a measure of actual loan losses.

In line with Altamuro and Beatty (2010), the analysis adopts a one-year lag between provisions of loan loss allowance and the writing-off actual credit losses. This is based on the assumption that it is more beneficial to make provision one year ahead than not to make provisions at all. Consequently, it is assumed that it could be easier to observe the predictive ability of loan loss provisions when the losses incurred in the following year are used in the analyses. Additionally, according to Wall and Koch (2000), early recognition of credit losses is preferable, which suggests that banks prefer to provide for losses in a more timely fashion – keeping the difference between loan provision recognition and actual credit losses recognition short. According to Marton and Runesson (2017), this further leads to higher predictive ability of loan loss provisions. Therefore, it is expected that banks in order to provide more timely and thus more relevant information about their loan loss provisions, the banks would ensure that the gap between LLP recognition and actual credit loss is minimised.

4.3.1 Regression models

The first objective of this study is as follows: *to investigate which loan loss accounting model (IAS 39 Incurred loss model vs. IFRS 9 Expected loss model) has superior predictive ability to estimate actual loan losses.* To test this objective the following regression equation has been constructed to examine the relationship:

$$GCO_{i,t+1} = \alpha_0 + \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 LLP \times IFRS_{i,t} + \alpha_4 LOA_{i,t} + \alpha_5 NPL_{i,t} + \varepsilon_{i,t} \qquad \text{Model (1)}$$

where $GCO_{i,t+1}$ indicates gross charge-offs in year $t+1$, $LLP_{i,t}$ is a loan loss provision in year t, $IFRS_{i,t}$ is the dummy variable for loan loss accounting model and $LLP \times IFRS_{i,t}$ is the interaction variable between loan loss provision and the loan loss accounting model. The subscript i represents an observed bank. The interaction variable $LLP \times IFRS_{i,t}$ examines the effect of incurred loss model prescribed by IAS 39 versus forward-looking model prescribed by EU local GAAP on the ability of loan loss provisions to predict actual loan losses in the following period. $LOA_{i,t}$ and $NPL_{i,t}$ are the control variables. $LOA_{i,t}$ indicates the total amount of loan portfolios, and $NPL_{i,t}$ indicates the total of non-performing loans held by a bank in year t.

In general, there are three important elements reported in bank's financial statements relating to changing credit risk. These include gross charge-offs, loan loss provisions and non-performing loans. The accrual accounting principle requires bank to recognise loan losses in the accounting period in which the events underlying these losses take place, despite the loan portfolio not being charged-off until the next accounting period. Consider a manufacturing plant that closes on 1 November 2019 and as a result, it is unable to repay a loan to a bank. While on 31 December 2019 when its bank prepares the financial statements, the loan made to the manufacturing plant has not defaulted yet, the bank has already a reasonable knowledge about deteriorating credit risk. Thus, under accrual accounting, the banks are required to recognise a reduction in the value of the loan, which in turn reduces the bank's reported income at the end of the accounting period (31 December 2019). Recording this in accounting is a multistage process. First, a bank is required to estimate the losses it expects to incur using necessary and permissible information. This is the step where the relevance of the loan loss provisioning model becomes critical – should a bank incorporate only past and current economic conditions, or should it also factor in reasonable future information in determination of loan losses? Second, a bank compares the value estimated in step 1 with the figure on its loan loss allowance account[69]. As part of the third step, it is typically observed that the value of expected losses due is greater than the amount on the loan loss allowance account. In this

[69] Loan loss allowance is the contra-asset account to loan portfolio.

case, a bank credits the loan loss allowance account and debits the loan loss provision account, which is an expense account (this is the route through which accounting earnings are influenced by loan loss provisioning). In the following accounting period, as and when loans actually default, they are charged-off against loan loss allowance, not against bank's income. Therefore, this accounting entry does not affect bank's accounting earnings. In summary, loan loss provisions represent the increase in the level of expected loan losses reported in bank's income statements, and loan charge-offs reflect all loans deemed as uncollectible during the accounting period. This is the key justification for selecting charge-offs as a dependent variable: loan loss provisions are recognised to predict loan charge-offs. Additional justification is that loan charge-offs are not reported in the financial statements directly, they are disclosed as part of financial statements footnotes as no separate account is associated with charge-offs.

Non-performing loans are defined as all loans in a bank's loan portfolio with 90 or more days overdue on interest or principal payments. According to Marton and Runesson (2017) both non-performing loans and gross charge-offs can be used as a dependent variable to ascertain the predictive ability of loan loss provisions. While both measures depend on the loan loss provisioning system, it is noteworthy to mention that the amount of non-performing loans is also determined by national banking regulation[70]. Wahlen

[70] For example, in 2018, the European Commission published a legislative document aiming to reduce the current value of non-performing loans held by EU banks. Non-performing loans do not only influence bank's income via unpaid loan interests and principal, they also impact bank's balance sheet and its regulatory capital required to generate new loans. This argument can be extended by claiming that a significant level of non-performing loans harms the real economy. The European Commission introduced a regulation amending the capital requirement and common minimum coverage levels for newly issued debt instruments that become non-performing. Based on this regulation, banks will create reserves to cover the risks related to potential future non-performing loans. In addition, the Commission also initiated measure that enables banks to recover losses on secured loans more rapidly outside of court and that encourages creation of markets where banks can sell their non-performing loans portfolios (Council of the EU, 2017).

(1994: p. 457) states that "non-performing loans result from circumstances largely exogenous to the bank manager's reporting decisions and involve relatively mechanical classification procedures. Thus, managers have limited discretionary ability to change the level of non-performing loans". This suggests that non-performing loans are restricted in terms of their ability to communicate private information that managers hold about the credit quality of bank's loan portfolios. Therefore, in order to accommodate the signalling hypothesis of discretionary loan loss provisions, the regression models adopt gross charge-offs as the dependent variable for examination of the predictive ability of loan loss provisions.

The second objective of this study is to examine the effect of auditor on the predictive ability of loan loss provisions to estimate actual loan losses. To evaluate this effect, the following regression model is estimated:

$$\begin{aligned} GCO_{i,t+1} = \alpha_0 &+ \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 LLP \times IFRS_{i,t} \\ &+ \alpha_4 PWCKPMG_{i,t} + \alpha_5 LLP \times PWCKPMG_{i,t} \\ &+ \alpha_6 LOA_{i,t} + \alpha_7 NPL_{i,t} + \varepsilon_{i,t} \end{aligned} \qquad \text{Model (2)}$$

where $PWCKPMG_{i,t}$ is a dummy variable equal to one if a bank is audited by an industry specialist auditor, and zero otherwise, and $LLP \times PWCKPMG_{i,t}$ is the interaction variable between loan loss provisions and auditor specialisation. The subscript i represents an observed bank. All other variables are as previously defined.

Prior research adopting audit specialisation measures have utilised various proxies to determine the audit specialisation (Craswell, Francis and Taylor, 1995; Gramling and

Stone, 2001; Cahan *et al.*, 2008; DeBoskey and Jiang, 2012; Gramling and Stone, 2001). The market share approach defines an audit specialist as an audit firm that "has differentiated itself from its competitors in terms of market share within a particular industry" (Neal and Riley, 2004: p. 170). This within-industry approach assumes that the relative market share of an auditing company is positively associated with industry specific knowledge. In other words, companies with a leading market share have developed the most relevant industry-specific knowledge, and their large market share represents significant investments made in audit technologies with an intention to enhance their audit quality. Neal and Riley (2004) outline two major issues with the market share approach: (1) auditing companies with small market share but with relevant industry knowledge would not be recognised as industry specialists; and (2) auditing companies serving competitive industries and generating significant revenues may be automatically considered as industry specialists without further considerations about their internal knowledge.

The second approach used to proxy auditing specialist is a portfolio share approach that highlights "the relative distribution of audit services and related fees across the various industries for each audit firm considered individually" (Neal and Riley, 2004: p. 170). The underlying assumption of this method is that audit fees embody the industry-specific knowledge which auditing firms hold. In other words, this approach defines an industry specialist as an auditing company generating most of its revenue from that particular industry, ignoring the element of market share. This is based on the assumption that a large portion of its significant revenue is then invested into resources to further develop industry-specific knowledge, even if the auditor does not maintain a leading market share within the industry. The main problem with this approach is that it is largely driven by the size of the industry and this may not reflect the auditor's intention to invest generated revenue into further improvements. This could lead to "a lack of variation within many industries, where every Big Six firms may be identified as a specialist in many of the largest industries and none may be identified as a specialist in the smallest industries" (Neal and Riley, 2004: p. 170).

Krishnan (2001) provides evidence that the two methods are not highly correlated, which could have a substantial effect on the research findings and result in limited comparability of the research findings generated by the two methods. Additionally, Neal and Riley (2004) use the two methods to identify audit specialist for each industry based on SIC classification that yield inconsistent results. They conclude by stating that identification of audit specialist and non-specialist remains a difficult task for researchers and depends on several factors such as the way revenues and market share is being measured (global, national or local) and the fact that industry-specific knowledge and audit technologies require time to develop and thus a time lag exists between revenue generation and market share capture.

For the purpose of this study, we follow the argument in DeBoskey (2012) stating that banks are more likely to identify an auditor as specialist according to the number of clients they serve. While this is similar to but not an exact representation of the market share approach, it follows a similar logic that a specialist auditor has differentiated itself from the pool of available auditors in terms of the number of clients served in a particular industry. According to the existing literature, globally and nationally, there are only few auditing specialists within the banking sector. DeBoskey (2012) provides evidence that none of the non-Big Four auditing companies qualifies as a specialist in the banking industry using four different measures for identifying audit specialist[71]. In addition, according to the General Accounting Office (2003) empirical analysis of Big Four companies, the two top auditors in banking industry are PricewaterhouseCoopers and KPMG with 35.6 per cent and 35.2 per cent of the total asset audited in the banking sector, respectively[72]. KPMG has a strong presence in the banking sector and audits many smaller and regional banks, whereas PWC primarily serves a larger clientele. Therefore, this study defines two audit specialists in the banking industry, namely KPMG and PWC. Moreover, since the other two Big Four auditors also have a substantial market share, this study runs sensitivity analysis that instead defines audit specialist as four Big Four entities (KPMG, PWC, Ernst & Young and Deloitte).

The third objective of this thesis is to examine the effect of reporting incentives on the predictive ability of loan loss provisions to estimate actual loan losses. To investigate the impact of bank's reporting incentives on the predictive ability of loan loss provisions, the following regression equation is estimated:

$$\begin{aligned} GCO_{i,t+1} = \alpha_0 &+ \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 LLP \times IFRS_{i,t} \\ &+ \alpha_4 SIZE_{i,t} + \alpha_5 LLP \times SIZE_{i,t} + \alpha_6 LOA_{i,t} \\ &+ \alpha_7 NPL_{i,t} + \varepsilon_{i,t} \qquad \text{Model (3)} \end{aligned}$$

[71] DeBoskey (2012) uses four different proxies for audit specialisation: (1) MOSTSHR is a dummy variable that equals one for industry specialist with the largest market share, and zero otherwise; (2) MOSTCL is a dummy variable that equals one for industry specialist with the largest number of clients in the industry, and zero otherwise; (3) LEADER is a dummy variable that equals one for industry specialist with a market share greater than 30 per cent, and zero otherwise; and PWCKPMG is a dummy variable that equals one if the auditor is PWC or KPMG, and zero otherwise.
[72] The third and fourth top auditors in the banking sector are Ernst & Young and Deloitte with 15.8 per cent and 11.2 per cent of the total assets audited, respectively.

where $SIZE_{i,t}$ is a proxy for bank's size defined as natural logarithm of total assets in time t, and $LLP \times SIZE_{i,t}$ is the interaction variable between loan loss provision and bank's size. The subscript i represents an observed bank. All other variables are as previously defined.

As discussed earlier in this thesis, loan loss provisions represent significant accrual items on banks' balance sheets and thus can often be subjected to management manipulation. For example, a bank reporting high (low) profitability may be incentivised to overstate (understate) loan loss provisions in order to decrease (increase) earnings and thus engage in income smoothing practice. Empirical evidence also suggests that banks use loan loss provisions to smooth their income, in particular banks with extremely low and high accounting income (Kanagaretnam, Lobo and Yang, 2004; Beck and Narayanamoorthy, 2013). In addition, Marton and Runesson (2017) suggest that larger banks are more subjected to political costs arising from the fact that politicians are concerned with wealth transfer in the form of taxes, regulations and other political costs. Research studies find evidence of strong link between disclosure and firm size and between disclosure and industry type (Gray, Meek and Roberts, 1995). However, there is less robust evidence on the association between profitability and disclosure as stated by Lemon and Cahan (1997: p. 79):

> *"Patten (1991) finds that the public pressure variables [firm size, and industry classification] are significant while the profitability variables were not. Patten interprets these results as supporting legitimacy theory where a firm must satisfy an implied contract with the society it operates in. To the contrary as firm size is commonly used to represent a firm's political visibility, we interpret Patten's results as consistent with the political cost hypothesis."*

Given greater exposure of large banks to political costs, it is theorised that larger banks follow the standards more closely. This is consistent with the view that closer compliance with standards reduces political costs. However, the more restrictive nature of loan loss accounting will limit the ability of bank's size effect to be observed, and thus the effect is in particular more visible under loan loss accounting model allowing more judgment, that is the expected loss model. Thus, for the purpose of this thesis, the size of a bank is adopted as a proxy for reporting incentives.

The fourth objective of this thesis is to examine the effect of bank's credit rating on the predictive ability of loan loss provisions to estimate actual loan losses. To investigate the impact of bank's credit rating on the predictive ability of loan loss provisions, the following regression equation is estimated:

$$\begin{aligned} GCO_{i,t+1} = {} & \alpha_0 + \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 LLP \times IFRS_{i,t} \\ & + \alpha_4 RANK_{i,t} + \alpha_5 LLP \times RANK_{i,t} \\ & + \alpha_6 LOA_{i,t} + \alpha_7 NPL_{i,t} + \varepsilon_{i,t} \end{aligned} \qquad \text{Model (4)}$$

where $RANK_{i,t}$ is a bank's credit rating in time t, and $LLP \times RANK_{i,t}$ is the interaction variable between loan loss provision and bank's credit rating. The subscript i represents an observed bank. All other variables are as previously defined.

Credit rating agencies provide a rating scale of risks which reflects a company's ability to meet debt obligations on time (Gogas, Papadimitriou and Agrapetidou, 2014). Credit ratings are regularly used by investors, creditors, government and other interested parties in their respective decision-making processes. Any changes in credit ranking result in actions from relevant stakeholders that could lead to significant changes in capital allocation. Therefore, it is vital that credit ratings are relevant and reliable. According to Cheng and Neamtiu (2009), the reliability of credit ratings depends on their timeliness, accuracy and stability[73] of estimating credit risk. Serious issues in relation to the quality of credit ratings provided by the major credit rating agencies[74] have been pointed out in the literature. First, credit rating agencies are faced with conflict of interest since their revenue is generated from provision of credit rating to these issuers (Mathis, McAndrews and Rochet, 2009). Secondly, the diminished reliability of credit ratings following the recent financial crisis resulted in unprecedented reputational damage that in turn led to decreased usage of credit ratings provided by the three major credit rating agencies. According to Mathis, McAndrews and Rocket (2009), such diminished usage of credit ratings may further continue despite observable improvements in terms of rating performance. Therefore, this study does not rely on any of the credit ratings issued by the three major credit rating agencies. Instead, the current study adopts measure of credit risk developed by the Economist Intelligence Unit (EIU) available at BankFocus database referred to as Banking Sector Risk. Banking Sector Risk is defined as "the risk of systemic crisis whereby bank(s) holding 10 per cent or more of total bank assets become insolvent and unable to discharge their obligations to depositors and/or creditors" (The Economist

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[73] Credit rating agencies define stability of their ratings as representations of "each issuer's fundamental creditworthiness […] without reference to explicit time horizons", and not the approximations of weighted probabilities of each issuer's default. Standard and Poor's state that "ratings express relative opinions about the creditworthiness of an issuer or credit quality of an individual debt issue, from strongest to weakest, within a universe of credit risk" (Standard and Poor's, 2014). In other words, changes in systematic risk that affect all companies in the same way should not induce significant changes in ratings. That is, credit ratings are to be established 'through-the-cycle' rather than 'point in time'. Otherwise, credit ratings would change significantly over time with factors influencing individual firms driving the change and not changes in the business cycle variables. However, the research does not suggest that credit ratings are pro-cyclical (Amato and Furfine, 2004).

[74] There are three major credit rating agencies that currently dominate the market. These include Moody's Investor Service, Standard & Poor's Global Ratings, and Fitch Ratings with 80 per cent of the total market share split equally between Moody's and Standard & Poor's, and 15 per cent of the total market share taken by Fitch (Statista, 2019).

Group, 2016: p. 3). The key advantages of EIU are (1) objectivity – unlike international rating agencies, the EIU is not compensated for providing ratings), (2) constant vigilance – ratings are updated three times a year, which ensures that any deterioration in credit is established timely, and (3) approach to risk management – in addition to reflecting sovereign risk, ratings also provide assessment of the soundness of each country's financial system and the risk of a currency devaluation.

Research has also pointed to various factors influencing bank credit ratings and the relevance of bank's estimation of credit risk. The evidence suggest that bank's loan loss provisioning and profitability are strongly associated with the credit rating received. Poon, Firth and Fung (1999) provide evidence that loan loss provisioning is the most important factor, followed by risk and then profitability that could explain and predict Moody's ratings. Pasiouras, Gaganis and Zopounidis (2006) further document that less cost-efficient banks, with higher than average loan loss provisions relative to their earnings and lower liquidity, tend to receive lower credit ratings. It is further suggested that given the significant effect of loan loss provisions on bank's profitability, credit ratings are positively related to bank's earnings.

As Ceuster and Masschelein (2003: p. 757) outline "the credit ratings of banks provide important bits of information and hence directly serve as an instrument of market discipline". Therefore, credit ratings do not solely point to bank's ability to deal with credit risk, they can also act as an enforcement proxy to which a bank must respond. While most of the literature focuses on other measures to proxy enforcement such as countries' legal and institutional systems[75], none of the reviewed studies adopt credit rating as a proxy for enforcement.

In general, there are two types of enforcement mechanisms which apply to banks. First, governmental enforcement seeks to maintain stability of the financial system and this is primarily achieved via macroprudential regulation. All banks are targeted by this type of enforcement regardless of their listing status. As mentioned in Chapter 1, it is not the purpose of this study to evaluate the link between macroprudential aspects and bank's financial stability represented by loan loss accounting. Instead, this study focuses on the link between general purpose financial reporting and bank's financial stability. Therefore, the second type of enforcement is of interest of this study, namely capital market enforcement. The objective of capital market enforcement is "to ascertain credible information for investment and lending decisions through consistent application of standards" (ESMA, 2014; SEC, 2014 in Marton and Runesson, 2017: p. 165). While all banks are subjected to governmental enforcement, only listed banks are targeted by capital market enforcement. Marton and Runesson (2017: p. 165) state that listing status "leads to greater interest from analysts, investors, and media, which results in a type of private sector enforcement for listed banks".

4.3.2 Results of secondary data analyses

In this section, the results of the regression models outlined in the previous section are presented. The very first part of secondary data analysis involves investigation of a

[75] The literature focuses on using variety of proxies such as corporate governance, statutory audit, institutional oversight system, public and press sanctions, rule of law, level of corruption and others (see La Porta, Lopez de Silanes and Shleifer, 2006; Jackson and Roe, 2008; Christensen, Hail and Leuz, 2013; and Preiato, Brown and Tarca, 2015).

benchmark model, in which all the independent and control variables are input against the dependent variable. Thus, the following regression model is run to ensure relevance of all the variables:

$$GCO_{i,t+1} = \alpha_0 + \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 PWCKPMG_{i,t} + \alpha_4 SIZE_{i,t} + \alpha_5 RANK_{i,t} + \alpha_6 LOA_{i,t} + \alpha_7 NPL_{i,t} + \varepsilon_{i,t} \qquad \text{Model (0)}$$

In the first step of Model (0) analysis, the researcher runs a random effect model to ensure significance of all the variables. Table 4.4 below reports the results. As predicted, there is a strong positive association between loan loss provisions and gross charge-offs suggesting that loan loss provisions have significant ability to predict next period credit losses. This result is in line with the evidence from Marton and Runesson (2017) and indicates that banks loan loss accounting plays an important role in signalling potential loan losses. As suggested by Beatty and Liao (2014) banks use loan loss reporting to signal positive information about credit risk of their loan portfolios and to signal intention to deal with bad loans. Wahlen (1994) also provide evidence that bank management tends to increase the discretionary portion of loan loss provisions when future cash flow prospects improve. This could be due to the stock price reactions that positively reflect unexcepted provisions as ‘good news’ (Wahlen, 1994). All other independent and control variables are statistically significant, which indicate their value relevance in the subsequent regression analyses.

The second step involved testing for endogenous regressors within the regression model. Endogenous variables are variables whose values are determined by other variables. As one of the assumptions of ordinary least square regression (OLS) is that there is no correlation between a predictor variable and an error term, the presence of endogenous regressors in the system leads to a failure of OLS estimation. The researcher therefore completes the Hausman test whose results suggests the presence of endogenous variables in the panel data. Thus, the researcher adopts fixed effects regression in the following regression analyses (Model 1, 2, 3 and 4).

In terms of control variables, as expected, there is a strong positive association between non-performing loans (coefficient 0.170 statistically significant at 1 per cent) and gross charge-offs. This supports the notion that banks holding more assets in non-performing loans report greater actual credit losses in the following accounting period. There is strong evidence documenting the effect of macroeconomic variables on the level of non-performing loans. Rinaldi and Sanchis-Arellano (2006) find that disposable income, unemployment rate and monetary conditions have strong impact on the amount of non-performing loans held by EU banks. Berge and Boye (2007) further document strong sensitivity of non-performing loans on the real interest rates and unemployment rates using a sample of Scandinavian banks during the period from 1993 to 2005. In general, the link suggests that there is a strong association between the business cycle and non-performing loans. In line with the institutional memory hypothesis discussed in Section 2.6.1.1, during times of economic expansion when banks have more positive outlook on the level of credit risk, loan loss provisions, gross charge-offs and non-performing loans are lower when compared to times of economic recession. Boss *et al.* (2009) provide evidence of positive relationship between credit risk and business cycle – this further adds to the amount of conclusive research findings documenting cyclicality in banking sector discussed in Section 2.6.

Similar analogy can be implemented to explain significant negative association between bank's loan portfolios and gross charge-offs (coefficient -0.052 statistically significant at 1 per cent). While it may be intuitive to suggest that the larger the loan portfolio the greater the credit losses, the results do not indicate a positive relationship. The negative relationship can be explained using the link between the lending cycle and the level of credit risk. During a period of economic expansion when banks experience fewer credit losses, banks also increase credit provisions and expand their loan portfolio (Berger and Udell, 2003). Therefore, the negative relationship between gross charge-offs and loan portfolios can be explained by both cyclicality in the banking sector and by the institutional memory hypothesis. Cyclicality of the banking variables suggests that since banks experience less credit losses during economic upturn, this sends a signal to bank management to increase credit provisions. The institutional memory hypothesis suggests that bank's ability to assess default risk deteriorates during economic boom and results in easing of lending standards that further increases credit provision. Berger and Udell (2003: p. 15) conclude that the observed procyclicality of the lending cycle that closely follow the economic cycle can lead to potential problems including "exacerbating business cycle, increasing systemic risks, misallocating lending resources and making it more difficult for external stakeholder to discipline banks".

Table 4.4: Results of regression models.

Variable	Model (0)	Model (1)	Model (2)	Model (2a)	Model (3)	Model (4)	Model (5)
Intercept	-0.111	0.370	0.377	0.368	3.201	0.679	-0.250
	(-0.98)	**(2.72)*****	**(2.77)*****	**(2.70)*****	**(6.67)*****	**(3.69)*****	**(-3.03)*****
$LLP_{i,t}$	0.038	0.042	0.029	0.053	-0.030	-0.357	0.190
	(2.10)**	(0.86)	(0.59)	(0.91)	(-0.20)	**(-2.47)****	**(11.96)*****
$IFRS_{i,t}$	-0.065	0.0467	0.048	0.047	0.063	0.023	-0.046
	(-2.68)***	(0.42)	(0.43)	(0.42)	(0.57)	(0.21)	**(-2.90)*****
$LLP \times IFRS_{i,t}$		-0.165	-0.187	-0.162	-0.145	-0.105	
		(-3.08)***	**(-3.37)*****	**(-2.99)*****	**(-2.71)*****	**(-1.82)***	
$PWCKPMG_{i,t}$	0.081		*(omitted)*				0.061
	(4.54)***						**(5.37)*****
$LLP \times PWCKPMG_{i,t}$			0.065				
			(1.53)				
$BIGFOUR_{i,t}$				*(omitted)*			
$LLP \times BIGFOUR_{i,t}$				-0.018			
				(-0.35)			

(continued on the next page)

Table 4.4: Results of regression models (continued).

Variable	**Model (0)**	**Model (1)**	**Model (2)**	**Model (2a)**	**Model (3)**	**Model (4)**	**Model (5)**
$SIZE_{i,t}$	0.024 **(6.21)*****				-0.195 **(-6.17)*****		0.026 **(10.81)*****
$LLP \times SIZE_{i,t}$					0.005 (0.51)		
$RANK_{i,t}$	-0.019 **(-1.63)***					-0.045 **(-2.45)****	-0.036 **(-3.85)*****
$LLP \times RANK_{i,t}$						0.059 **(2.90)*****	
$YEAR_{2012}$							*(omitted)*
$YEAR_{2013}$							-0.016 **(-0.99)***
$YEAR_{2014}$							0.032 **(1.92)***
$YEAR_{2015}$							0.053 **(3.13)*****
$YEAR_{2016}$							0.131 **(7.74)*****

(continued on the next page)

Table 4.4: Results of regression models (continued).

Variable	**Model (0)**	**Model (1)**	**Model (2)**	**Model (2a)**	**Model (3)**	**Model (4)**	**Model (5)**
$LOA_{i,t}$	-0.052	-0.147	-0.149	-0.147	-0.121	-0.147	-0.004
	(-3.28)****	**(-5.66)******	**(-5.71)******	**(-5.64)******	**(-4.62)******	**(-5.67)******	(-0.34)
$NPL_{i,t}$	0.170	0.262	0.260	0.263	0.269	0.255	0.107
	(13.52)****	**(11.91)******	**(11.83)******	**(11.89)******	**(12.24)******	**(11.52)******	**(11.08)******
R^2	0.206	0.105	0.122	0.102	0.005	0.110	0.252

Note: Table 4.4 shows the regressions results of Model (0), (1), (2/a), (3) and (4). Single period lagged GCO is used. Year and country fixed effects are included in Model (1), (2/a), (3) and (4). Random effects are included in Model (0) and (5).

, ** and * denote statistical significance at 10, 5 and 1 per cent (two-tailed test), respectively. The z/t-statistics are based on adjusted standard error and are reported in parentheses. All variables are as previously defined.*

4.3.2.1 Hypothesis 1

The first objective of this study is to investigate which loan loss provisioning model (IAS 39 Incurred loss model or IFRS 9 Expected loss model) has superior ability to predict actual loan losses. Model (1) outlined in Section 4.3.1 addresses this objective by examining the following hypothesis:

H1: *The predictive ability of loan loss provision to estimate actual loan losses is greater for provisions estimated using IFRS 9 Expected loss model relative to IAS 39 Incurred loss model.*

Table 4.4 above shows the results of the Model (1). To test the hypothesis 1, the focus should be on the interaction variable $LLP \times IFRS_{i,t}$. Observing the coefficient -0.165, it becomes evident that it is statistically significant at 1 per cent. This result suggests that loan loss provisioning in accordance with IAS 39 Incurred loss model has strong economic effect. However, since the coefficient has negative value, this clearly indicates that loan loss provisions determined according to the IAS 39 Incurred loss model have lower predictive ability with respect to gross charge-offs relative to the predictive ability of loan loss provisions determined in line with more forward-looking model as allowed by EU Local GAAP. Therefore, the hypothesis 1 has not been rejected.

The literature has indicated several reasons for the potential superiority of more forward-looking model when compared to IAS 39 Incurred loss model for loan loss accounting. The adopted time period for secondary data analysis (2012-16) occurs after the global financial crisis and during the times of relative economic prosperity. During this time both accounting and banking regulators were already aware of dangers associated with strict adherence to the incurred impairment model, and changes towards loan loss accounting have been well underway during this period. For example, in April 2009, Financial Stability Forum explicitly expressed concerns over the incurred loss model, stating:

> *"Under the current accounting requirements of an incurred loss model, a provision for loan losses is recognised only when a loss impairment event or events have taken place that are likely to result in non-payment of a loan in the future. Identification of the loss event is a difficult and subjective process that results in a range of practice and, potentially, a failure to fully recognise existing credit losses earlier in the credit cycle. Earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness" (FSF, 2009: p. 4).*

Further criticism from G20 leaders (2009) and the rise of the European sovereign debt crisis sent urgent requests to the major accounting standard setters to improve the impairment rules and to incorporate more forward-looking principles. This desired change in accounting for financial assets impairment sent vital clues to both preparers and users of financial statements and altered the existing stance towards the suitability of the incurred loss model. Banks in particular have strong incentives to alter their economic conduct in response to the accounting changes given that accounting treatments can directly influence the level of bank's regulatory capital (BIS, 2015). For example, fair value accounting has been demonstrated to have negative effect between asset prices, fire sales and regulatory constraints. In other words, accounting treatment with inclusion of fair value could lead to increases in asset values that further improve regulatory capital and allow banks to expand their credit provision. Xie (2012) provides evidence that fair value accounting affects the lending behaviour of banks, which could be explained by greater variability in regulatory capital held by banks after the adoption of fair value measurement. As discussed earlier in this thesis (see Section 1.4.1), IFRS 9 Expected loss model can be regarded as the culmination between fair value model and the Incurred loss model for loan loss accounting. Therefore, the users of financial statements may have valued forward-looking evaluation of credit losses as more beneficial for their decision-making processes, and thus priced such information higher relative to those determined under IAS 39 Incurred loss model. Whilst the hypothesis 1 does not test for value relevance of loan loss provisions, there is a strong evidence suggesting that fair value accounting information significantly add value to the reported figures. Gorcharov and Hodgson (2011) document that adding other comprehensive income (determined by fair value measurement) to net income improves the predictive ability to estimate future cash flows. Similar evidence has been reached by Mechelli and Cimini (2014) that further suggest that fair values provide value relevant information beyond those already disclosed in historical cost measures.

4.3.2.2 Hypothesis 2

The second objective of this study is to investigate the effect of auditor specialisation on the predictive ability of loan loss provisions to estimate actual loan losses. Model (2) outlined in Section 4.3.1 addresses this objective by examining the following hypothesis:

H2: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks whose auditor is an industry specialist than in those banks whose auditor is not an industry specialist.*

Table 4.4 above shows the results of Model (2). First, the interaction variable $LLP \times IFRS_{i,t}$ reports the coefficient value -0.162 that is statistically significant at 1 per cent two-tailed test. This suggests that loan loss provisions determined under IAS 39 Incurred loss model have lower predictive ability to estimate next period credit losses, which is in line with the findings from Model 1.

To test hypothesis 2, it is important to observe the interaction variable $LLP \times PWCKPMG_{i,t}$. This variable is not statistically significant and reports the positive coefficient 0.065. This indicates that there is not a statistically significant association between a banking industry specialist and the ability of loan loss provisions to predict future credit losses. However, since the coefficient is positive and very close to being significant at 10 per cent two-tailed test (*p*-value equals to 0.120), it could be suggested that banks audited by one of the industry specialists (PWC or KPMG) provide some indications of superior loan loss provisions in terms of their predictive ability to estimate next period gross charge-offs.

Whilst the support for the hypothesis 2 was not found at 5 per cent statistical level, a positive coefficient of the interaction variable $LLP \times PWCKPMG_{i,t}$ suggests that the presence of KPMG or PWC during the audit process could improve the predictive ability of loan loss provisions. However, this is not statistically significant. It is assumed that one of the reasons for rejecting hypothesis 2 could be due to the EU regulation that requires all EU listed entities to follow IFRS standards[76]. Therefore, all listed banks have no option but to follow IAS 39 Incurred loss model for loan loss accounting and apply more rigid and less timely rules when determining credit losses. The evidence also suggests that non-Big Four auditing companies audit only 15 of UK's 350 largest listed

[76] The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.

entities and all firms except two from the S&P 500 (Crump, 2013). This situation is even more pronounced in the banking sector where banks audited by Big Four firms comprise 98 per cent of the world's largest banks (Citizen Electoral Council, 2019). Therefore, listed banks are more likely to be audited by one of the Big Four auditors anyway. This does not only raise concerns over the competition and collusion forces but also about potential bookkeeping-audit misconducts which have defined the recent global financial system. In the light of the additional evidence about dominance of Big Four auditors in the banking sector, it was decided that the dummy variable *PWCKPMG* variable will be redefined and include not only PWC and KPMG but any of the Big Four auditors. Therefore, Model (2a) is constructed where the dummy variable *PWCKPMG* is replaced with a dummy variable $BIGFOUR_{i,t}$ that is equal to one if a bank is audited by PWC, KPMG, Ernst and Young or Deloitte Touche, and zero otherwise. Further, the variable $LLP \times PWCKPMG_{i,t}$ is replaced with $LLP \times BIGFOUR_{i,t}$, which is the interaction variable between loan loss provision and Big Four auditor. The results of this model (Model 2a) are presented in Table 4.4 above. The purpose of this additional testing was to expand the inclusion of all Big Four auditors as banking audit specialists and to ensure that the presence of an audit specialist is not a significant factor influencing the predictive ability of loan loss provisions. The results document the same conclusion, the interaction variable is not statistically significant and reports a negative coefficient -0.018. This finding further strengthens the original result, since after the inclusion of all Big Four auditors as industry specialists, the coefficient becomes negative suggesting a worsening in terms of predictive ability of loan loss provisions in banks audited by Big Four entities. Whilst this is not significant, it supports the initial findings that the presence of KPMG or PWC during a bank's audit process does not affect the predictive ability of loan loss provisions to estimate future credit losses.

The additional key factor which could have influenced this result is another EU regulation concerning mandatory auditor rotation. First, in 2011, the European Commission published a proposal to change Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts, together with a draft for a regulation on specific requirements regarding statutory audit of public-interest entities. The European Commission defines public-interest entity as an entity with securities listed on a regulated market of any member state, credit institutions and insurance entities. Therefore, all entities included in this study's sample are considered to be public-interest entities since all are essentially credit institutions regardless of their listing status. The regulation came into the effect on 17 June 2016, and the key change involved the maximum audit tenure for public-interest entities of 10 years, which can be extended up to 20 years by way of mandatory tender, at the latest after 10 years. While this regulation affected this study through the adopted time period (2012-16) only in the last year, it is vital to understand that mandatory audit rotation was already prescribed by law in majority of EU member states, either in form of mandatory audit firm rotation[77] or audit partner rotation[78]. It is evident that a large majority of EU member states prescribed mandatory partner rotation rather than mandatory audit firm rotation (7 versus 25 out of 28 member states respectively). This is an important observation since the change in audit partner does not necessarily lead to change in audit firm, which could result in continuous audit firm tenure. Whilst this study does not examine the relationship between audit tenure and the

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[77] The following EU countries required mandatory audit firm rotation: Belgium, Croatia, Iceland, Italy, Poland, Portugal, and Slovenia.

[78] The following EU countries required mandatory audit partner rotation: Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the UK.

predictive ability of loan loss provisions, it can be argued that banks are less likely to change auditing firm before the adoption of the EC Regulation. As PWC (2013) stated:

> *"[…] for larger, more complex companies, and in particular the banking industry, the adverse impact [of mandatory rotation] is likely to be even more severe. Banking is a heavily regulated complex industry with unique features. […] The institutional knowledge, skills, and experience required to perform a high-quality audit of a large complex bank are not easily or quickly replicated. […] A deep understanding of the business being audited is critical to audit quality – particularly to audit the many complex judgments reflected in a bank's financial statements".*

There are two sides to the notion of mandatory audit rotation; the proponents argue that a long-standing auditor is more likely to agree with the management opinion resulting in acquiescence bias, which has a detrimental effect on auditor's independence and audit quality (Ryan *et al.*, 2001; Farmer, Rittenberg and Trompeter, 1987). The evidence from Carrey and Simmett (2006) documents that long partner tenure is associated with a lower propensity for the partners to issue a going-concern opinion and evidence of likelihood of missing earning benchmarks. This suggests that earnings quality may be positively affected by the length of auditor tenure. On the other hand, the opponents claim that increased costs associated with mandatory rotation exceed the benefits (Hussey and Lan, 2001). In addition, they argue that longer relationships between auditor and audited company could result in enhanced audit quality (Chen, Lin and Lin, 2008; Chung, 2004). In this regard, the evidence suggests that longer tenure periods are associated with less earnings management both in terms of discretionary and non-discretionary accruals (Myers, Myears and Omer, 2003). Further evidence by Myers *et al.* (2004) use restatements as a proxy for accounting quality but find no support for the hypothesis that regular auditor rotation reduces the need for financial restatements. Carcello and Nagy (2004) also fails to provide evidence that longer audit tenure could lead to fraudulent financial reporting practices. In average, the existing studies do not support the argument that earnings quality deteriorates with longer audit firm tenure. It is noteworthy to mention that the limitation of these studies is the fact that audit firm tenure is correlated with partner tenure, therefore, the findings could be attributable to firm tenure rather than partner tenure. Given that audit firm rotation was only mandatory in 7 EU countries during the tested time period, the findings may not be fully representative of this study setting (since audit firm rotation was less likely than partner rotation). In addition, the evidence on the link between earnings and accruals quality and audit tenures is also mixed.

Another possible reason for the observed non-significance of auditor specialist in determination of predictive ability of loan loss provisions could be the definition of banking audit specialist. This study adopts GAO (2003) finding that the top two auditors in banking sectors are KPMG and PWC. Indeed, there are other methods as discussed in Section 4.3.1 such as market share or portfolio share approach that could be used to define industry specialist. However, it is argued that the result could also be driven by the collinearity[79] issue associated with *KPMGPWC* and *BIGFOUR* variables. Again, this is most likely to be caused by banks not willing to change audit firm, and the regulation driving this observation during the studied time period.

4.3.2.3 Hypothesis 3

The third objective of this study is to investigate the effect of reporting incentives on the predictive ability of loan loss provisions to estimate actual loan losses. Model (3) outlined in Section 4.3.1 addresses this objective by examining the following hypothesis:

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[79] Collinearity refers to a statistical phenomenon when one of more independent variables in regression model is highly linearly correlated with another independent variable(s).

H3: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in larger banks than in smaller banks, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

The results of Model (3) are reported in Table 4.4 above. First, it can be observed that the interaction variable $LLP \times IFRS_{i,t}$ reports a statistically significant coefficient -0.145, which is in line with Model (1) and (2) findings and support the hypothesis 1. In other words, it is documented across the three models that loan loss provisions determined in line with IAS 39 Incurred loss model report inferior predictive ability in relation to gross charge-offs.

To test hypothesis 3, it is important to first observe interaction variable $LLP \times SIZE_{i,t}$. This variable is not statistically significant, which suggests that size is not a defining factor in predictive ability of loan loss provisions. However, the variable $SIZE_{i,t}$ which reports a coefficient -0.195 is statistically significant at 1 per cent two-tailed test. This documents that a bank's size is negatively associated with the next period reported credit losses. In other words, the larger the bank the smaller the losses written-off from loan portfolio in the next accounting period. This finding is intriguing and can be seen as contradictory to the way in which banks experience credit losses. It may be intuitive to agree that larger banks (in terms of their assets) have larger loan portfolios and thus larger loan loss provisions. While this statement can be true, larger loan loss provisions do not automatically mean larger credit losses. The actual loan losses are driven by different forces than those that define loan loss provisions. As argued throughout this thesis, and in particular in Section 1.4.1, loan loss provisions are primarily predicted by a loan loss accounting model. On the other hand, actual credit losses are defined by a default occurred on loans that can be influenced by wider macroeconomic variables.

The procyclicality of the financial system could explain the observed negative relationship between bank's size and gross charge-offs. During times of economic expansion, banks experience positive growth in their loan portfolio. This is primarily driven by unrealistic assumptions of economic growth, which then leads to loosening of the lending standards. This behaviour is captured by the institutional memory hypothesis (discussed in Section 2.6.1.1) which has further consequences on a bank's business conduct. With the expansion of credit provision and bank's balance sheet during economic expansion, the banks do not report as much credit losses as they do during recession. If there was an evidence of deterioration of loans quality, banks would reduce credit expansion, which would otherwise have a negative effect on bank's assets. This could explain the negative relationship between bank's size and gross charge-offs since this study period is situated during an economic expansion when lending was generally on the rise and credit losses were decreasing. In general, the increase of credit losses suggests the beginning of recession, to which banks respond accordingly, usually by restricting their lending or charging higher interest (Berger and Udell, 2003).

An important layer of institutional memory hypothesis that also predicts procyclicality in the banking sector is the agency problem[80]. The relationship between bank management and external stakeholders, in particular supervisors and regulators, worsens during economic expansion. Given that during the last credit bust banks were under close scrutiny from regulators, this is less evident during expansion, which results in regulators having less relevant information about the bank's lending standards, borrowers and financial stability. For regulators to discern efficiency of bank management, observation of loan performance may not be fully sufficient given very few observable problem loans during economic expansion. This situation further reduces bank management incentives to implement strategies and policies to address potential deterioration of loan portfolio quality over the lending cycle. Regulators may also decide not to impose any additional blunt policies which may endanger bank-borrower relationships, which in turn could have value-destroying consequences that could potentially spread across banking sector. In addition, some banks may prefer to act in herding manner and to assume correlated risks to avoid any additional costs that may be imposed on them by separating themselves from their counterparts. These various agency considerations suggest that the institutional memory hypothesis might apply to large banks more while other factors could be associated with smaller banks to a larger extent. Large banks are typically characterised by greater separation of ownership and management, the bedrock of agency theory, and

[80] An agency relationship is defined as one in which one of more persons (principal(s)) contract another person (agent) to perform some service on their behalf, which involves delegating some decision-making authority to this person (Jensen and Meckling, 1976; Ross, 1973). The agency problem arises because of the separation between ownership and control and in particular when the interests of owners (principals) are not aligned with those of managers (agents). In other words, owners appoint managers to act in their best interest to maximise their shareholder wealth. However, mangers can act in a way that prioritise their opportunistic interests maximising their own personal welfare at the cost of the company. In general, there are three types of agency costs that could prevent, and limit undesirable effects associated with agency relationship. First, monitoring costs are any costs incurred in relation to the supervision of manager's actions. Second, bonding costs are designed to ensure that managers do not take actions that would result in damage of shareholder value such as compensation or bonuses. And third, residual loss refers to actual damage caused by agency problem that is uncorrected by monitoring or bonding costs.

more layers of separation between bank top management and loan officers responsible for the initial decision regarding lending approval. The presence of these characteristics tends to increase agency costs that could also exacerbate institutional memory hypothesis. The research evidence clearly points out that agency costs are higher among entities with outsider managers, are inversely related to manager's ownership structure, and increase with the number of non-executive shareholders (Ang, Cole and Lin, 2000). On the other hand, smaller banks more frequently enter into relationships with more informationally opaque borrowers. Large banks tend to avoid issuing credit to such borrowers given their disadvantage in relation to difficulty of disclosing information about these borrowers (Stein, 2002), which could negatively impact a bank's valuation. It is important to mention that large institutional borrowers may also have some characteristics of informationally opaque borrowers (Carey *et al.*, 1994), however, their easy access to public capital markets gives them an opportunity to enter and leave bank finance at different points in business cycle (Kashyap, Stein and Wilcox, 1993; Einarsson and Marquis, 2001). This further strengthens their position as a borrower since these large borrowers may be less affected by the banking institutional memory hypothesis.

In light of the previous discussion and the results of Model (3), the hypothesis 3 is not accepted. However, the bank's size is found to be a significant factor in the definition of future credit losses. As suggested by agency theory and the institutional memory hypothesis, larger banks are subject to greater monitoring costs and greater prevalence of institutional memory problems, therefore, they are more likely to ensure that credit losses are minimised. This is to ensure that these banks maintain their status and access to public capital markets (Kashyap, Stein and Wilcox, 1993).

4.3.2.4 Hypothesis 4

The fourth objective of this study is to investigate the effect of a bank's credit rating on the predictive ability of loan loss provisions to estimate actual loan losses. Model (4) outlined in Section 4.3.1 addresses this objective by examining the following hypothesis:

H4: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks with higher credit rating than in banks with lower credit rating, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

The results of Model (4) are reported in Table 4.4 above. By observing the results of Model (4), first, it becomes evident that the interaction variable $LLP \times IFRS_{i,t}$ is significant at 10 per cent two-tailed test and has a negative coefficient -0.105. The findings are consistent across all five models tested (Models 1, 2, 2a, 3, 4) and provide conclusive evidence that loan loss provisions determined in accordance with IAS 39 Incurred loss model have lower predictive ability to estimate gross charge-offs relative to those estimated using a more forward-looking model.

To investigate hypothesis 4, it is important to observe the two variables: $RANK_{i,t}$ and $LLP \times RANK_{i,t}$. First, it can be seen that variable $RANK_{i,t}$ is statistically significant at 5 per cent two-tailed test and reports negative coefficient value -0.045. Second, the interaction variable $LLP \times RANK_{i,t}$ is also statistically significant at 1 per cent two-tailed test and reports positive coefficient value 0.059. The results suggest that banking sector risk is negatively associated with the value of gross charge-offs. In other words, banks with higher attached code to Economist Intelligence Unit score (representation of banking sector risk) report smaller gross charge-offs. It is vital to refer to Table 3.4 on page 117 and observe the coding that was adopted in relation to banking sector risk – a higher number was attached to lower banking sector risk. Therefore, while the negative coefficient in variable $RANK_{i,t}$ is observed, the positive relationship between banking sector risk and gross charge-offs is established. In other words, banks with a lower level of banking sector risk report smaller credit losses. Furthermore, it can be observed that banking sector risk is also strongly influential in predictive ability of loan loss provisions – since the coefficient 0.059 is positive, it suggests that the predictive ability of loan loss provisions is greater in banks with lower banking sector risk (again one should refer to Table 3.4 on page 117 that shows the coding adopted in relation to the banking sector risk). In conclusion, the support for Hypothesis 4 is found and thus, Hypothesis 4 is not rejected.

Korte (2015: p. 214) states that "banks generally contribute to the performance of the real economy by collecting, transforming, allocating, and monitoring credit in its most productive uses, thereby improving the efficiency of capital allocation and reducing the cost of external financing" (Beck, Levine and Loayza, 2000; Levine, 2005). It is explicit in Korte's statement that banks play an important role in the economy and as such are often discussed in relation to financial stability objectives. The relationship between banks and the real economy has been well established in the literature (Fisman and Love, 2007; King and Levine, 1993; Rajan and Zingales, 1998). Therefore, the financial health of banks is not only important at individual level, but even more vital for the performance and stability of the global economy. Concepts such as moral hazard theory and information asymmetry represent problems that may distort a bank's financial stability and lead to economic suboptimal outcomes. These outcomes may further expose inherent fragility of the banking sector and lead to systemic crisis. It is precisely what the Banking

Sector Risk proxy measures. The Economist Group (2016: p. 3) states that banking sector risk proxy measures "the risk of a systemic crisis whereby bank(s) holding 10 per cent or more of total bank assets become insolvent and unable to discharge their obligations to depositors and/or creditors". Systemic risk could arise as a result of distressed banks that become insolvent over time. There are several dimensions that inform the link between bank's solvency and systemic risk, and thus between banking sector risk and the accounting information quality. First, banks can exhibit distorted incentives that may emerge from the treatment of potential insolvency. As discussed in Section 2.5.1, the banking sector is subjected to a free-riding problem where banks can 'enjoy' protection from governments in the form of insurance schemes designed to prevent systemic risk realisation. In particular, banks considered 'too-big-to-fail' could take advantage of this public good and be provided with bailout using taxpayer funds. This creates an additional risk dimension as it could lead to excessive risk taking (Beltratti and Stulz, 2012; Fortin, Goldber and Roth, 2010), intentional inflation of balance sheet (Demirgüç-Kunt and Detragiache, 2005), lack of robust lending standards and screening policies (Dell'Ariccia and Marquez, 2006), and incentives to create opaque accounting information (DeYoung, Kowalik and Reidhill, 2013).

Second, the research evidence points to bank's excessive herding behaviour at times of low capitalisation (Stever and Wilcox, 2007). This excessive herding behaviour results in inefficient credit allocation that could further increase the credit risk which banks experience both individually and collectively. Excessive herding behaviour in the banking sector leads to "a concentration on particular asset classes that may not necessarily be merited by economic considerations" (Korte, 2015: p. 214). The excessive herding can lead to further detrimental effects in form of a "gamble for resurrection"

(Freixas and Rochet, 2008 in Korte, 2015: p. 214) in an attempt to improve economic soundness of a bank. This could be facilitated through ineffective credit monitoring and piling up of non-performing loans (Igan and Tamirisa, 2008; Peek and Rosengren, 2005; Rajan, 1994). These actions lead to value reduction in bank’s balance sheet that negatively affect its solvency position which is then reflected in bank’s overall risk measure. According to Demirgüç-Kunt *et al.* (2008), banks with moral hazard concerns are typically subjected to monitoring and disciplining by their depositors. However, little power can be exerted by small and dispersed depositors. In addition, such monitoring can be constrained by the existence of bailout guarantees that provide depositors with a form of insurance against the losses caused by a bank's inability to pay its debts when due. This is also supported by the findings from Model (3) where size is identified as a significant variable in prediction of bank’s charge-offs. Larger banks typically serve larger institutional clients that have greater power to exert their monitoring and disciplinary power over their lenders relative to small disperse clients. Therefore, larger banks are more concerned with their business conduct and may be more willing to increase the costs to reduce agency problem, moral hazard and other information asymmetries. This could further decrease the bank’s overall risk profile and credit losses experienced by large banks. Acharya (2012) further provide evidence that the credit spreads of bonds issued by large financial institutions are less risk sensitive relative to those issued by smaller firms. Acharya (2012: p. 29) justifies this finding by stating that “bondholders of large financial institutions have an expectation that the government will shield them from losses in the event of failure and, as a result, they do not accurately price risk”. This further suggests that larger banks are able to shift risk onto the public safety net more effectively than smaller counterparts. While this may cause monitoring from depositors to be reduced, risk shifting essentially also reduces bank's credit risk and potential credit losses being experienced in the future periods.

4.3.2.5 Effect of time period

In addition to analyses conducted as part of hypotheses testing, the researcher decided to also observe the effect of categorical variable – time period by containing this variable in the regression Model (0) as an indicator variable. This is to observe how the significance of each time period has changed over the adopted time period. Therefore, the following model is constructed:

$$\begin{aligned} GCO_{i,t+1} = \alpha_0 + \alpha_1 LLP_{i,t} + \alpha_2 IFRS_{i,t} + \alpha_3 PWCKPMG_{i,t} + \alpha_4 SIZE_{i,t} \\ + \alpha_5 RANK_{i,t} + \alpha_6 LOA_{i,t} + \alpha_7 NPL_{i,t} + \alpha_8 YEAR_{2012} \\ + \alpha_9 YEAR_{2013} + \alpha_{10} YEAR_{2014} + \alpha_{11} YEAR_{2015} \\ + \alpha_{12} YEAR_{2016} + \varepsilon_{i,t} \end{aligned} \qquad \text{Model (5)}$$

where YEAR is an indicator variable for the respective time period from 2012 to 2016; all other variables are as previously defined.

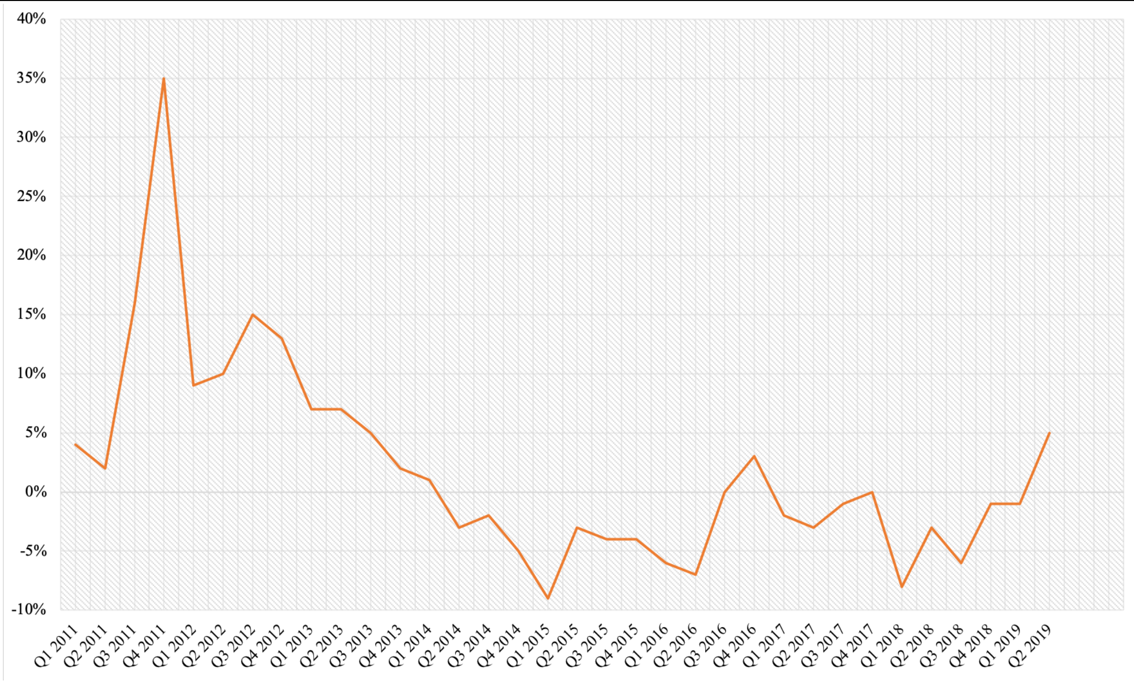
The results of Model (5) are presented in Table 4.4 above. The results show that with the passage of time, the significance of the model is increasing. For example, it can be observed that year 2013 is not statistically significant and also reports a negative coefficient. However, statistical significance can be observed in year 2014, 2015, and 2016 at 10, 1 and 1 per cent two-tailed test. While these findings cannot be interpreted in terms of an increasing predictive ability of loan loss provisions towards credit losses, they suggest that the passage of time increases the significance of the independent variables in relation to the dependent variable. In other words, the association between loan loss provisions and credit losses becomes more significant with the passage of time.

The researcher suggests that at least two reasons exist for this result. First, the final version of IFRS 9 was issued in July 2014, which replaced IAS 39 Incurred loss model with the expected loss model. It is precisely year 2014 when the significance turns to be statistically significant. The IFRS 9 project was initially a part of the IASB and FASB' joint project initiative. However, both the IASB and FASB stopped working on the project jointly due to limited support for the three-stage impairment model proposed by IASB. Instead, in 2013, the FASB decided to pursue a single measurement approach[81] which requires companies to recognise lifetime expected credit losses for all assets (not only those that are placed in Stage 3 as in accordance with IASB IFRS 9 three-stage model). This incidence could have sent an important message to the preparers of the financial statements that the failure of the joint project could result in a more rapid development and implementation of the standard. As stated by Macintosh, former vice-chairman of the IASB, "in various aspects of this project [IFRS 9], including the netting of derivatives, loan loss provisioning and in the classification and measurement of financial instruments, we have seen the boards sit around the table and reach a converged outcome, only to see that agreement melt away". Furthermore, the actual issuance of the standard could have also triggered the wave of requirement for IFRS consultancy services given a short period between IFRS issuance (July 2014) and its effective data (January 2018). This is further supported by the results since the years are becoming statistically significant with the passage of time.

[81] ASU 2016 Measurement of Credit Losses on Financial Instruments will not become effective until 2020 at the earliest.

The second reason that could potentially explain the increasing significance of the passage of time is the institutional memory theory. According to the institutional memory hypothesis, the ability of banks and other lending institutions to assess credit risk deteriorates as time passes since the last 'learning experience'. The researcher argues that the IFRS 9 issuance triggered the 'learning experience', which have resulted in more robust evaluation of credit risk by the banking sector. In general, the learning experience is defined on the basis of the past recession during which banks encountered significant credit losses due to poor risk assessment. However, it could also be a significant change in the accounting treatment that could 'remind' reporting entities of the importance of credit risk evaluation. One of the important elements within the IFRS 9 Expected loss model has been the transfer of debt instruments between the three stages of the impairment model. This involves the assessment for significant deterioration of credit risk that entails not only information from past events and current conditions, but also reasonable and supportable forecasts (IFRS 9.5.517). In addition, the very purpose of the expected loss model is to mitigate procyclicality in the banking sector, which is a concern over the expansion of banks' equity during economic booms that can improve the banks' perceived ability to raise further debt. The expansion of a banks' balance sheet could be driven by both lax lending standards and limited provisioning for loan losses. However, with the IFRS 9 issuance, these aspects could have been refreshed in banks' management policies that could have triggered more robust loan loss provisioning. This is particularly relevant since the time period of this study (2012 – 2016) is situated within the expansionary period of the business cycle. During boom periods, bank's internal loan auditing system and loan reviews typically report easing of the credit standards which result in easing of credit approval. Observing Figure 4.1 below, it becomes evident that from 2011 to 2019, credit standards in the euro area for loans to enterprises were eased significantly. In 2011, on average, the net tightening of credit standards by euro area banks was at 14 per cent, whereas, in 2018, it was -4.5 per cent for credit standards on loans to non-financial corporations.

Figure 4.1: Easing of credit standards.



Note: Figure 4.1 depicts the net tightening of credit standards applied by euro area banks loans to non-financial corporations.
Source: Compiled by the author using the Euro Area Banking Lending Surveys conducted by the European Central Bank published between 2011 and 2019.

During 2015, it can be seen that credit standards were eased the most dramatically (the average net tightening of credit standards by euro area banks was -5 per cent). This is immediately after the issuance of IFRS 9 in July 2014. Similar observation can be made during year 2018 which reports the average net tightening of credit standards by euro area banks at -4.5 per cent. From January 2018, IFRS 9 became mandatory for all publicly listed entities in the European Union. In light of this evidence, it supports the notion that lending standards deteriorate with the passage of time since the last recession. In addition, it can also be observed that since 2018 the easing of lending standards has slowly moved into positive figures, which could suggests some sort of ‘learning experience’ in relation to risk evaluation. This learning experience could have been triggered by the adoption of IFRS 9 and thus more robust and comprehensive risk evaluation methodology. However, this is not tested empirically and thus remains a plausible cause.

4.4 Conclusion

This chapter has examined the predictive ability of loan loss provisions in relation to actual credit losses reported by EU public and private banks. More specifically, it was tested whether IFRS 9 Expected loss model is able to estimate actual loan losses more effectively relative to the IAS 39 Incurred loss model. Initially, descriptive statistics were performed, followed by relevant regression analyses. The tests did confirm hypothesis 1. In other words, loan loss provisions determined in line with a forward-looking model, used as a proxy for IFRS 9 Expected loss model, are able to predict actual credit losses in the next period more precisely than loan loss provisions determined using the IAS 39 Incurred loss model. Further tests indicate that neither auditor specialisation nor bank’s size have any effect on the predictive ability of loan loss provisions to estimate actual loan default losses. However, there is an indication that bank’s size alone is able to predict future credit losses. Lastly, strong support is found for hypothesis 4 and that the predictive ability of loan loss provisions to estimate actual loan losses is greater in banks with a higher credit rating than in banks with a lower credit rating.

The results obtained so far in this chapter are based on the secondary data only and do not take into account variations in opinions amongst financial analysts and academics in relation to loan loss accounting. Furthermore, the data for the expected loss model are proxied using forward-looking model based on EU local GAAP. For this purpose, the next chapter employs survey research, examining the opinions and views of both financial analysts and academics in relation to the two loan loss provisioning models specifically.

Chapter 5 Survey analysis

5.1 Introduction

This chapter presents the results of a survey questionnaire distributed and completed by accounting and finance academics and practitioners (financial analysts). The survey questionnaire sought to complement the empirical analyses conducted in Chapter 4 which examined the predictive ability of loan loss provisions solely statistically. In particular, this chapter documents the results of 107 survey questionnaire responses completed online over the period from February 2019 to October 2019. To date, very little is known about the usefulness of the IFRS 9 Expected loss model based on the evidence from primary data. Furthermore, none of the prior studies in this area has sought to provide insights into opinions of both scholars and practitioners when investigating loan loss accounting. In addition, to the best of researcher's knowledge, this is the first study that examines IFRS 9 Expected loss model after its adoption in January 2018. Therefore, this thesis makes a contribution in an area that has not been previously examined.

The remainder of this chapter is organised as follows. Section 5.2 provides information about the survey questionnaire; the distribution time period, description of each section and the way the data were collected. Section 5.3 outlines the sample details and provide insights into composition of the sample of survey participants in terms of gender, age, education amongst other. Section 5.4 provides insights into descriptive statistics and outlines preliminary findings emerging from the survey questionnaire data. Section 5.5 discusses the results of Section B, C and D of the survey questionnaire with respect to sub-groups of participants identified. Finally, Section 5.6 summarises the results of primary investigation, and Section 5.7 concludes the chapter.

5.2 Questionnaire information

The survey questionnaire data collection was conducted between Monday, the 4th February 2019 and Friday, the 10th October 2019. The survey questionnaire consisted of four sections and it is attached in Appendix 1. Section A consists of six questions which focus on background information about the participants, such as their gender, age, employment, achieved education and experience with provision of investment decisions. Section B contains four questions, which ascertain the participants' opinions towards loan loss provisioning rules. In particular, this section tests for aspects of impairment trigger, recognition of interest income, collective assessment and future events. These aspects have been widely debated in loan loss provisioning literature and were the subject of changes associated with move towards IFRS 9 Expected loss model (Gebrahrdt, 2016; Novotny-Farkas, 2016; Camfferman, 2015). Section C is composed of six questions. This section ascertains participants' opinions about IAS 39 Incurred loss model and the aspects commonly criticised in the literature as delaying credit loss recognition and resulting in insufficient allowances ('too little too late'). And section D includes six questions investigating participants' opinions about IFRS 9 Expected loss model and the aspects of loan loss provisioning primarily targeted by the new standard. The majority of questions in sections B, C and D adopt Likert scale measurement system with five categories of available responses[82]. In addition to Likert scale questions, sections C and D include one open-ended question each. The purpose of these questions is to explore other attributes in loan loss provisioning that could be detrimental for the assessment of credit risk. This is to reflect the fact that credit risk evaluation is a complex and often subjective task which is a function of multiple variables and not only those included in the Likert scale

[82] Five categories of responses include: strongly agree; agree; neither/do not know; disagree; and strongly disagree.

questions. The questionnaire was distributed via online invitation to potential participants who were asked to complete the questionnaire on UCL *Opinio* web-based survey tool[83]. As part of the data collection, the questionnaire was pilot tested between Friday, 14th September 2018 and Monday, 5th November 2018. The results of reliability testing of the pilot questionnaire are reported in Section 3.7.3.

Each respondent was assigned a code to maintain their anonymity and protect confidentiality of their data. However, at the same time, the questionnaire did not collect any sensitive information such as data concerning racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union memberships, or data relating to participants' health, sexual life or sexual orientation. All data were kept safe at the University of Buckingham servers at all times.

5.3 Questionnaire sample

The purpose of the current study is to ascertain the opinions and views of financial analysts and academicians on the information environment in relation to the move from IAS 39 Incurred loss model to IFRS 9 Expected loss model. In particular, this study examines the views of financial analysts, and accounting, finance and banking academicians. The researcher has used a variety of channels to distribute online invitations to the relevant population of financial analysts and academics. The following sources have been utilised in extracting contact information (email address) of the

[83] The survey questionnaire can be accessed using the following link: https://opinio.ucl.ac.uk/s?s=59810.

participants: (1) CFA Institute Directory[84]; (2) LinkedIn; and (3) universities' websites. The researcher has targeted participants registered within the borders of European Union to ensure that the sample is familiar with International Financial Reporting Standards which became mandatory for the preparation of consolidated financial statements for all European listed entities since January 2005[85].

One of the key issues encountered during data collection was the inability to reach participants with relevant knowledge and/or experience with the loan loss provisioning rules. There are at least two reasons for this observation. First, the topic of IFRS 9 Expected loss model is a relatively very new theme within both practitioner and academic groups. For that reason, the participants may not have had sufficient knowledge to answer the questions included in the questionnaire and may thus decide to abandon their response. Additionally, since the standard came into the effect in January 2018, there has only been one accounting period applying the new rules, which further suggests limited potential to experience the process of loan loss provisioning using the Expected loss model. Second, the topic of loan loss provisioning is a niche topic within the research community where only small number of academics publish on this subject. Table 5.1 below illustrates and supports the presence of inexperience and limited knowledge of loan loss provisioning rules amongst the practitioners and academicians with the overall response rate being 1.38 per cent.

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[84] CFA Institute is a non-profit global organisation that offers certification programmes for investment professional. It is formerly known as the Association for Investment Management and Research (AIMR), the CFA Institute has currently over 70,000 members across the globe that hold the Chartered Financial Analyst qualification. The CFA Directory can be publicly accessed via the following link: https://www.cfainstitute.org/community/membership/directory/Pages/index.aspx#section-1.

[85] The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.

Table 5.1: Response rate of questionnaire data collection.

Month	Number of invitations sent	Number of completed responses	Number of uncompleted responses	Response rate (in %)
February 2019	408	35	35	8.58
March 2019	878	22	28	2.51
April 2019	3794	17	15	0.45
May 2019	746	7	12	0.94
June 2019	210	5	1	2.38
July 2019	1026	13	10	1.27
August 2019	0	1	2	-
September 2019	232	0	0	0
October 2019	466	7	7	1.50
Total	7760	107	110	1.38[86]

Note: Table 5.1 shows the number of online invitations sent to financial analysts and academics using contact information extracted from CFA Institute Directory, LinkedIn and universities websites. The table further shows number of fully completed and uncompleted responses received and the corresponding response rate. The response rate is calculated as the proportion of completed responses to number of invitations sent in a particular month.
Source: Constructed by the author.

While a high survey response rate is an important element of questionnaire validity as it diminishes sampling bias (Dillman, Smyth and Christian, 2009; Groves *et al.*, 2009; Singer, 2006), it is assumed that a high level of uncompleted responses could be regarded as an indication of low incidence level of acquiescence bias. Given that online invitations were sent out to participants only once, it is reasonable to expect that only knowledgeable and/or experienced respondents completed the survey. In such instance, the questionnaire validity is enhanced by unnecessary pressure put on participants to complete the survey, potentially leading to incidence of central tendency bias and/or acquiescence bias.

[86] 1.38 per cent is the overall response rate to the survey questionnaire distributed amongst accounting and finance scholars and practitioners.

The final sample consists of 107 participants, out of which 51 participants work in practice with jobs ranging from credit analysts, bankers to portfolio managers; and 56 participants working in academia with jobs ranging from lecturers, readers to emeritus professors. Table 5.2 below shows the number of practitioners and academics in relation to the questions included in Section A: Background Information of the questionnaire. By observing the results presented in Table 5.2 below, it becomes evident that both sub-groups (practitioners and academics) are dominated by male participants with 90 and 77 per cent of participants being males in the respective sub-groups. Panel B in Table 5.2 shows that the two sub-groups are relatively balanced in terms of participants age groups. Both sub-groups mostly consist of participants being between 31 and 40 years old. However, it appears that practitioners are slightly younger than academics. Panel C in Table 5.2 illustrates educational differences between practitioners and academics. Most practitioners possess master's degree or professional qualification as the highest level of education (67 per cent of all practitioners), whereas academics mostly hold doctoral degree as their highest level of education achieved (75 per cent of all academics). Panel D in Table 5.2 depicts that practitioners have more experience working in financial services or wealth management when compared to academics. 84 per cent of practitioners versus 38 per cent of academics have more than 5 years of such working experience. Interestingly, Panel E in Table 5.2 documents that both sub-groups are relatively balanced in terms of the distribution of participants providing guidance on investment decisions. Approximately 41 per cent of practitioners and 38 per cent of academics provide investment guidance either occasionally or regularly. That said, a significant proportion of participants never provided investment guidance, in total 61 per cent on average of all participants.

Table 5.2: Characteristics of the questionnaire survey participants.

	Practitioners (n=51)		Academics (n=56)	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Panel A: Gender				
Male	46	90.2	43	76.8
Female	5	9.8	12	21.4
Prefer not to say	0	0	1	1.80
Panel B: Age group				
18 - 30 years	10	19.6	4	7.1
31 - 40 years	20	39.2	22	39.3
41 - 50 years	17	33.3	15	26.8
Over 50 years	4	7.8	15	26.8
Panel C: Highest level of education completed				
Less than bachelor’s degree	1	2.0	0	0
Bachelor's degree	12	23.5	1	1.8
Master's degree	25	49.0	8	14.3
Doctoral degree	4	7.8	42	75.0
Professional qualification	9	17.6	5	8.9
Panel D: Working experience in financial services or wealth management				
Less than 1 year	0	0	17	30.4
1 - 5 years	8	15.7	18	32.1
5 - 10 years	11	21.6	5	8.9
More than 10 years	32	62.7	16	28.6
Panel E: Frequency of guidance provision on investment decisions				
Never	30	58.8	35	62.5
Occasionally	11	21.6	17	30.4
Regularly	10	19.6	4	7.1

Note: Table 5.2 shows number of practitioners and academics included in the sample with reference to the questions included in Section A: Background Information of the questionnaire.
Source: Constructed by the author.

5.4 Descriptive statistics

Table 5.3 below shows the results of descriptive statistics (mean, median, mode, standard deviation, variance, skewness and kurtosis) for all the survey questions included in Section B, C, and D using all completed answers (that is practitioners and academics in combination). Considering Section B which evaluates opinions and views towards loan loss provisioning rules, it first become evident that participants tend to <u>agree</u> with the following two statements:

B1: Recognition of loan losses should always be tied to an objective evidence of impairment trigger in the form of an event subsequent to initial loan recognition; and

B2: Recognition of interest income through effective interest rate should be based on the contractual future cash flows, not the predicted/expected future cash flows.

This suggests that participants tend to agree with IAS 39 Incurred loss model in terms of need for the evidence of impairment trigger that would result in recognition of loan loss, and reliance on contractual future cash flow when recognising interest income.

On the other hand, participants tend to <u>disagree</u> with the following two statements:

B3: If there is no indication of loan impairment at individual level, loans should <u>not</u> be assessed for impairment at portfolio level; and

B4: Impairment model for loan loss provisioning should <u>not</u> allow to incorporate the effects of future events expected to occur after the balance sheet date.

Table 5.3: Descriptive statistics of survey questions.

Construct/ Section	Section B: Design of loan loss provisioning				Section C: IAS 39 Incurred loss model					Section D: IFRS 9 Expected loss model				
Question	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**	**D3**	**D4**	**D5**
N	107	107	107	107	107	107	107	107	107	107	107	107	107	107
Mean	2.48	2.77	3.24	3.55	2.67	3.17	3.10	2.92	3.12	3.00	3.38	2.60	3.18	3.20
Median	2.00	2.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
Mode	2.00	2.00	4.00	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	2.00	4.00	4.00
Std. Deviation	1.09	1.14	1.15	0.98	0.90	1.02	0.82	0.95	0.86	0.88	0.90	0.90	0.92	0.87
Variance	1.20	1.29	1.32	0.97	0.81	1.05	0.68	0.91	0.73	0.77	0.81	0.81	0.85	0.76
Skewness	0.37	0.28	-0.19	-0.87	0.06	-0.24	0.12	-0.43	-0.42	0.00	-0.06	0.52	-0.29	-0.48
Kurtosis	-0.93	-1.05	-1.13	0.21	-0.53	-0.53	-0.36	-0.52	-0.14	-0.52	-0.53	-0.25	-0.62	-0.47

Note: Table 5.3 shows central tendency statistics: mean, median, mode; and other descriptive statistics (standard deviation, variance, skewness and kurtosis) of each survey question for each construct evaluated (Section B, C, and D) using all participants combined.
Responses are based on a five-point Likert Scale where 1 = strongly agree; 2 = agree; 3 = do not know/neither; 4 = disagree; and 5 = strongly disagree.

In contrast, participants' disagreement with statement B4 documents their preference towards the IFRS 9 Expected loss model in terms of incorporation of events expected to occur after balance sheet date. Disagreement with statement B3 does not give preference to any loan loss provisioning model since both models require collective evaluation of impairment if no indication of loan impairment exists at individual level.

These findings somehow contradict each other and document that participants prefer some elements of the IAS 39 Incurred loss model (such as objective evidence of impairment trigger and reliance on contractual rather than expected cash flows for recognising interest income), and some elements of IFRS 9 Expected loss model (such as incorporation of events expected to occur after balance sheet date).

Considering Section C that examines the views and opinions on decision usefulness of the IAS 39 Incurred loss model, it can be observed that, in average, participants tend to <u>agree</u> with the following two statements:

C1: The IAS 39 loan loss provisioning rules prohibit timely recognition of loan losses.

C4: The IAS 39 loan loss provisioning rules prevent banks from provisioning appropriately for existing credit losses.

These findings indicate that the IAS 39 Incurred loss model is regarded as inferior for purposes of decision making, in particular, in relation to timeliness of accounting information and provisioning for potential losses. This result is consistent with the existing theoretical underpinnings which argue for adoption of more forward-looking loan loss provisioning model. In particular, the incurred loss model has often been criticised for delaying the recognition of loan losses mostly due to the requirement of objective evidence of impairment which would result in recognition of loan loss. This is in contrast with Section A which finds that participants, in average, agree that recognition of loan loss should always be tied to an objective evidence of impairment trigger in the form of an event subsequent to initial loan recognition. These are the conflicting results that will be investigated further in the later sections.

Considering Section C further, participants tend to disagree with the following three statements:

C2: The IAS 39 loan loss provisioning rules unreasonably emphasise the concept of prudence leading to excessively conservative recognition of loan losses.

C3: The IAS 39 loan loss provisioning rules unduly limit management discretion to signal private information.

C5: Considering a bank with an indication of risk default in loan portfolio, increase in IAS 39 loan loss provisions suggests that the bank is not dealing with loan default risk constructively.

The results document that participants do not find IAS 39 Incurred loss model excessively prudent nor insufficiently discretionary. These findings are in contrast with previous research which suggests that more forward-looking models, such as the IFRS 9 Expected loss model, provide significant room for managerial discretion which may be used to communicate private information (Novotny-Farkas, 2016). Hoogervorst (2014) further suggests that the incurred loss model unduly restricts latitude to signal private information since the impairment is only recognised just before default occurs.

Considering Section D which examines participants' views and opinions about IFRS 9 Expected loss model, the results document that, in average, participants <u>agree</u> with the following statement:

D3: The IFRS 9 loan loss provisioning rules significantly increase the monitoring costs of credit risk.

This observation is in line with the practitioners' and academics' views that monitoring of the credit risk will increase following the adoption of IFRS 9. This is, in particular, with connection of evaluation of credit risk increase from Stage 1 to Stage 2 and from Stage 2 to Stage 3. The aspect of 'significant increase in credit risk' has often been criticised on the basis of that IFRS 9 does not provide comprehensive definition of significant increase in credit risk, which makes the assessment from Stage 1 into Stage 2 challenging (Gebhardt, 2016).

The results further indicate that participants tend to <u>disagree</u> with the following three statements:

D2: The IFRS 9 loan loss provisioning rules introduce stronger incentives to delay the recognition of loan losses.

D4: Provisioning for day-one-loss undermines the objectivity of credit risk reporting.

D5: Considering a bank with an indication of risk default in loan portfolio, increase in IFRS 9 loan loss provisions suggests that the bank is not dealing with loan default risk constructively.

Considering the results above, participants, on average, do not agree that provisioning for day-one-loss could undermine the objectivity of credit risk reporting. Day-one-loss has been stipulated as one of the detriments of the expected loss model since according to the model, a reporting entity must provide for 12-month expected credit losses from the first day a loan is recognised in a balance sheet. This may result in unnecessary provisions being recognised which could undermine one of the fundamental characteristics of financial information – faithful representation[87]. Additionally, forward-looking models for loan loss provisioning have been associated with stronger incentives to delay recognition of loan losses since loan loss provisions significantly affect banks' balance sheet and thus have considerable effects not only on banks' earnings but also on their regulatory capital (Benston and Wall, 2005).

Further observation indicates that participants are indifferent in relation to the following statement:

D1: The IFRS 9 loan loss provisioning rules provide negative opportunities to engage in earnings management.

[87] For financial information to be represented in a faithful manner, it should be complete, neutral and free from error (Cf. IASB, 2010: QC4).

Table 5.4: Correlation matrix.

Variable/ Question	Section A: Background information								
	A1	**A2**	**A3**	**A4**	**A5**	**A6**	**B(AV)**	**C(AV)**	**D(AV)**
A1	1.000								
A2	-0.187	1.000							
A3	**-0.235***	0.001	1.000						
A4	**-0.419****	-0.012	0.135	1.000					
A5	**0.485****	-0.038	**0.300****	**-0.221***	1.000				
A6	0.113	-0.063	-0.075	-0.158	**0.197***	1.000			
B(AV)	**0.202***	0.070	0.098	-0.028	0.158	-0.056	1.000		
C(AV)	**0.212***	-0.102	0.120	-0.134	0.123	-0.029	0.089	1.000	
D(AV)	**0.198***	0.096	-0.041	-0.083	-0.007	-0.105	**0.428****	**0.263****	1.000

Note: Table 5.4 reports Pearson's correlation coefficients between Section A survey questions and the three constructs evaluated in Section B, C and D using all participants combined. B(AV), C(AV) and D(AV) *represent the average values of all the questions included in Section B, C and D (except for qualitative questions included in Section C and D).*
**, ** indicate statistical significance at 5 and 1 per cent, respectively.*

Table 5.4 above presents the correlation results between the Section A survey questions and average values of questions included in Section B, C and D. Pearson's correlation analysis is adopted since some of the variables are continuous variables (job title, gender, education). First, it can be observed that practitioners are more likely to be male (correlation coefficient -0.235), with lower educational qualification (correlation coefficient -0.419), and to have greater working experience in financial services or wealth management (correlation coefficient 0.485).

There are also significant positive correlations between constructs B, C and D, and A1 (participant being a practitioner). These observations indicate that practitioners tend to prefer rules of the more forward-looking model (correlation coefficient 0.202). However, at the same time, practitioners do not consider the IAS 39 Incurred loss model (correlation coefficient 0.212) nor the IFRS 9 Expected loss model (correlation coefficient 0.198) to hinder efficient decision-making in relation to credit risk evaluation.

To provide a more robust and comprehensive evaluation of participants views, further analyses are conducted on three separate sub-samples:

(1) Group 1: Academics;
(2) Group 2: Practitioners; and
(3) Group 3: Participants who provided qualitative comments in Section C and/or Section D.

This has been decided based on the inconsistency of results documented in Section 5.4 which suggest contrasting views and opinions in relation to preference towards loan loss provisioning rules within the sub-groups.

5.5 Analyses according to the questionnaire sections

5.5.1 Kruskal-Wallis and Mann-Whitney U tests

The Kruskal-Wallis test is utilised to evaluate the differences in responses reported in survey questionnaire between multiple groups. In the current study, the three distinct groups are identified and specified in Section 5.4. The Kruskal-Wallis test (1952) is a non-parametric approach to the one-way ANOVA which investigates the probability that independent samples arose from the same population. The test is commonly used when the independent variables are measured at least at the ordinal level (in this study, this is represented by the Likert scale options ranging from strongly agree to strongly disagree), and the dependent variable is not normally distributed. When performing the Kruskal-Wallis test, the null hypothesis states that the samples are from identical populations. On the other hand, the alternative hypothesis states that at least one of the groups has been drawn from a different population in comparison with the others.

The Mann-Whitney U test is also a non-parametric test which is utilised instead of an independent-samples *t*-test. However, unlike *t*-test, the Mann-Whitney U test can be performed on small sample sizes; ordinal, interval and ratio measures. Furthermore, the assumption of normal or quasi-normal distribution does not have to be assumed. The Mann-Whitney U tests the null hypothesis that both samples come from the same population in terms of ranks. In this study, the three Mann-Whitney U tests are conducted using the combination of the three sub-groups: (1) Academics – Practitioners; (2) Practitioners – Participants with qualitative feedback; and (3) Academics – Participants with qualitative feedback.

Table 5.5: Descriptive statistics of survey questions according to the sub-groups.

Panel A: Descriptive statistics of Group 1 participants (academics).

Construct/ Section	**Section B: Design of loan loss provisioning**				**Section C: IAS 39 Incurred loss model**					**Section D: IFRS 9 Expected loss model**				
Question	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**	**D3**	**D4**	**D5**
N	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Mean	2.50	2.59	3.09	3.27	2.63	2.98	3.02	2.79	2.95	2.96	3.14	2.64	3.04	2.98
Median	2.00	2.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.50	3.00	3.00
Mode	2.00	2.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
Std. Deviation	1.08	1.02	1.08	0.94	0.75	1.00	0.75	0.87	0.80	0.81	0.77	0.80	0.79	0.80
Variance	1.16	1.05	1.17	0.89	0.57	1.00	0.56	0.75	0.63	0.65	0.60	0.63	0.62	0.64
Skewness	0.14	0.17	-0.45	-0.97	-0.05	-0.08	0.23	-0.43	-0.58	0.28	-0.01	0.74	-0.30	-0.19
Kurtosis	-1.25	-1.19	-0.86	-0.25	-0.25	-0.36	-0.45	-0.32	0.22	-0.85	-0.78	0.20	-0.68	-0.84

(continued on the next page)

Panel B: Descriptive statistics of Group 2 (practitioners).

Construct/ Section	**Section B: Design of loan loss provisioning**				**Section C: IAS 39 Incurred loss model**					**Section D: IFRS 9 Expected loss model**				
Question	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**	**D3**	**D4**	**D5**
N	51	51	51	51	51	51	51	51	51	51	51	51	51	51
Mean	2.45	2.96	3.41	3.86	2.73	3.37	3.20	3.06	3.31	3.04	3.53	2.53	3.33	3.43
Median	2.00	3.00	4.00	4.00	3.00	4.00	3.00	3.00	3.00	3.00	4.00	2.00	4.00	4.00
Mode	2.00	2.00	2.00	4.00	2.00	4.00	3.00	4.00	4.00	3.00	4.00	2.00	4.00	4.00
Std. Deviation	1.12	1.23	1.20	0.94	1.04	1.02	0.89	1.03	0.88	0.96	0.99	1.01	1.03	0.90
Variance	1.25	1.52	1.45	0.88	1.08	1.04	0.80	1.06	0.78	0.92	0.97	1.01	1.07	0.81
Skewness	0.61	0.21	-0.07	-1.08	0.03	-0.47	-0.06	-0.58	-0.49	-0.22	-0.35	0.47	-0.50	-0.99
Kurtosis	-0.55	-1.25	-1.60	1.13	-0.90	-0.39	-0.30	-0.54	-0.34	-0.33	-0.37	-0.57	-0.62	0.61

(continued on the next page)

Panel C: Descriptive statistics of sub-sample of participants with qualitative input.

Construct/ Section	**Section B: Design of loan loss provisioning**				**Section C: IAS 39 Incurred loss model**					**Section D: IFRS 9 Expected loss model**				
Question	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**	**D3**	**D4**	**D5**
N	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Mean	2.86	3.43	3.79	4.14	2.29	3.57	3.43	2.29	3.36	3.14	3.79	2.36	3.71	3.79
Median	3.00	4.00	4.50	4.00	2.00	4.00	4.00	2.00	3.50	3.00	4.00	2.00	4.00	4.00
Mode	4.00	4.00	5.00	4.00	1.00	4.00	4.00	1.00	4.00	2.00	3.00	2.00	4.00	4.00
Std. Deviation	1.17	1.50	1.58	0.66	1.27	1.34	1.09	1.07	0.74	1.03	0.98	1.15	0.61	0.58
Variance	1.36	2.26	2.49	0.44	1.60	1.80	1.19	1.14	0.56	1.06	0.95	1.32	0.37	0.34
Skewness	-0.36	-0.55	-0.96	-0.15	0.43	-0.62	-0.20	0.22	-0.73	0.17	-0.09	0.58	-2.17	-2.80
Kurtosis	-1.46	-1.29	-0.76	-0.31	-1.54	-0.87	-1.27	-1.10	-0.64	-1.30	-1.03	-1.09	4.25	7.68

Note: Table 5.5 shows central tendency statistics: mean, median, mode; and other descriptive statistics (standard deviation, variance, skewness and kurtosis) of each survey question for each section/construct evaluated (Section B, C, and D) according to the sub-groups of participants.
Panel A reports descriptive statistics for the sub-sample of academic participants.
Panel B reports descriptive statistics for the sub-sample of practitioner participants.
Panel B reports descriptive statistics for the sub-sample of participants that provided qualitative feedback in Section C and/or Section D of the questionnaire.
Responses are based on a five-point Likert Scale where 1 = strongly agree; 2 = agree; 3 = do not know/neither; 4 = disagree; and 5 = strongly disagree.

5.5.2 Design of loan loss provisioning rules (Section B)

The first line of investigation includes the evaluation of the preference towards the loan loss provisioning rules. The investigation targets the first objective of this study – which is to investigate which loan loss accounting model (IAS 39 Incurred loss model vs. IFRS 9 Expected loss model) has superior predictive ability to estimate actual loan losses. Referring to Table 5.5 above, first, the results for the two sub-groups of academics (Panel A) and practitioners (Panel B) are compared. The findings for both sub-groups are consistent with the preliminary results reported in Section 5.4 using total combined sample. In other words, it is observed that, on average, both academics and practitioners agree with statements B1 (mean values 2.50 and 2.45 respectively) and B2 (mean values 2.59 and 2.96 respectively) and disagree with statements B3 (mean values 3.09 and 3.41 respectively) and B4 (mean values 3.27 and 3.86 respectively). However, when the third sub-group's results are observed, it can be seen that participants who provided substantial qualitative feedback, in contrast, tend to disagree with statement B2 (mean value 3.43) and follow the similar trend with regards to statements B1, B3 and B4 (mean values 2.86, 3.79 and 4.14 respectively). The findings document that there is a tendency to disagree with statements B2, B3 and B4 that, which on average, suggests general preference for a more forward-looking model for loan loss accounting.

Considering statement B1, it is evident that all three sub-groups on average agree with the statement that recognition of loan losses should always be tied to an objective evidence of impairment trigger in the form of an event subsequent to initial loan recognition (mean value 2.48 for combined sample). This result gives support to loan loss accounting in accordance to IAS 39 Incurred loss model, however, it is in contrast with criticism often directed towards the Incurred loss model. IAS 39 Incurred loss model has frequently been accused of resulting in insufficient allowances as a result of loss-event criterion which a reporting entity must adhere to. In other words, without the objective evidence of impairment, provisions could not be set-up.

When statement B2 is considered, it becomes evident that on average, participants tend to agree with the statement that recognition of interest income through effective interest rate should be based on contractual future cash flows, not expected future cash flows (mean value 2.77 for combined sample). Similarly, to statement B1, this gives support to the IAS 39 Incurred loss model. However, according to the Mann-Whitney U test (see Table 5.6 below) significant difference exists between accounting scholars and participants with qualitative feedback (*p*-value 0.033). More specifically, academics tend to give greater preference to the IAS 39 Incurred loss model (mean value 2.59), whereas participants with qualitative feedback tend to prefer a more forward-looking model (mean value 3.43). Similar evidence can also be observed in relation to statements B3 (*p*-value 0.025) and B4 (*p*-value 0.001). Since the majority of participants with qualitative feedback are practitioners (71 per cent of the sub-group 3 are practitioners), this could suggest that significant differences exist between opinions of scholars and practitioners towards the application of loan loss accounting rules. If we also assume that the sub-group 3 has a stronger knowledge base about loan loss accounting (since they provided qualitative feedback), it could imply that practitioners' opinions should be weighed as more relevant. Despite the fact that existing knowledge base was not tested as part of the survey questionnaire, this observation is pertinent to this study and will be reflected upon in subsequent analyses.

Referring to the results in Table 5.6 below, with respect to statement B3, participants in average tend to disagree that loans should not be assessed for impairment at portfolio level if there is no indication of loan impairment at individual level (mean value 3.24), with similar findings observed across all three sub-groups. With regard to statement B4, participants also tend to disagree with the statement that impairment model should not allow to incorporate the effects of future events expected to occur after the balance sheet date (mean value 3.55). However, the *p*-values of Mann-Whitney U test indicate that significant differences exist between scholars and practitioners, and between practitioners and participants with qualitative feedback. However, this difference is only in terms of how strongly these sub-groups tend to disagree with statement B4.

Considering the full array of investigation, it is concluded that participants, on average, do not give preference to either the IAS 39 Incurred loss model or the more forward-looking model in its entirety. However, there are indications that the forward-looking model is preferred on average. This is on the basis of observations of sub-group 3 results, in which the participants disagree with three out of four statements; thus, giving preference to a more forward-looking model for loan loss accounting in average. However, this conclusion is reached upon the assumption that participants in sub-group 3 possess more comprehensive knowledge about loan loss provisioning rules and models in question.

However, if the mean values of the combined sample are observed, the survey participants favour the IAS 39 Incurred loss model in terms of the objective evidence that impairment acts as a trigger for loan loss recognition, and for recognition of interest income on the basis of contractual rather than expected future cash flows. Both of these aspects refer to objective evidence; the statement B1 refers to the 'loss-event' criterion, whereas the statement B2 refers to the cash flows objectively defined in the contract. This finding is interesting, since the principle of objectivity has been significantly critiqued in the literature for leading to insufficient allowances for potential credit losses (Gebhardt, 2016; Camfferman, 2015). It is suspected that the use of term 'objective evidence' is well entrenched among both accounting scholars and practitioners, and that this could lead to inherent preference towards information that could be reliably verified in situation where judgment and discretion is restricted since it could introduce unnecessary bias and noise. However, it is worth noting that the development of the IASB Conceptual Framework resulted in replacement of the concept of 'reliability' (a fundamental characteristic of financial information) with 'faithful representation'. This asserts that IASB is shifting towards concepts that do not fully emphasise information in objective form but rather information which serve decision-making objectives. In other words, loan loss provisions (and other information reported in financial statements) can be faithfully represented using relevant sources of information that could, however, also rely on discretion and judgement without being fully reliable. However, such financial information is significantly pertinent for decision-making processes because it provides insights into potentially private information that should be communicated to relevant stakeholders. The following assertion by one of the survey respondents suggests that verifiability of information is vital to loan loss accounting and inherently present within IAS 39 Incurred loss model given its objective form.

> *"[I]n fact; the IAS 39 model balances the verifiability objective against fair reporting of losses."*

It is evident from the statement above that verifiability acts as a significant factor influencing the fittingness of the loan loss provisioning model. However, the participant also suggests that a balance between verifiability and reporting of loan losses should exist, which documents participant's emphasis on reporting existing credit losses (including expected credit losses).

While the IASB Conceptual Framework (2010) specifies verifiability as one of the enhancing characteristics of financial information – verifiability is not the same as objectivity. According to the revised IASB Conceptual Framework (2010: ph. 2.30), "verifiability means that different knowledgeable and independent observers could reach consensus, although not necessarily complete agreement, that a particular depiction is a faithful representation". Clearly, verifiability refers to faithful representation and does not imply objective evidence. The faithful representation characteristic of financial information has been adopted after increasingly widespread adoption of fair value accounting (Whittington, 2008; Ronen, 2008). However, fair value accounting has been widely criticised for embodying a considerable range of assumptions and judgments that some commentators describe as being 'fictional' and 'imaginary' in essence (Casson and Napier, 1997). Furthermore, arguments are often presented that such discretion may lead to manipulation and bias of financial information. The research evidence also supports this line of argument by documenting significant valuation differences across fair value hierarchy levels. In other words, the studies confirm that the value relevance of fair values is negatively related with fair value hierarchy (So and Smith, 2009; Siekkinen, 2016; Goh *et al.*, 2015; Magnan, Menini and Parbonetti, 2015; Müller, Riedl and Sellhorn, 2015; Chung *et al.*, 2017; Israeli, 2015; Song, Thomas and Yi, 2010; Badenhorst, Brümmer and de Wet, 2015) which supports the argument that investors are more likely to decrease the weight they place on less reliable Level 2 and Level 3 fair value estimates. This evidence could explain why some participants view 'objective evidence' as an enhancing factor, and by contrast, discretion as a detrimental feature to reliability of financial information, giving support to IAS 39 Incurred loss model.

On the other hand, other participants are explicit about the fact that the IAS 39 Incurred loss model is insufficient in provisioning for future credit losses. For example:

> *"Insufficient flexibility for expert judgement or 'banking' balance sheet protection where you believe but cannot demonstrate that it will be required at a future point."*

The statement above documents the restrictive nature of IAS 39 Incurred loss model in accounting for losses that are expected to arise after the balance sheet date and thus not allowed to be included in loan loss provisions. This is in stark contrast to previous discussion and documents that some participants regard expert judgement to be a vital factor to improve reporting of future losses and to communicate internal information with relevant stakeholders.

Corporate governance mechanisms play an important role in curbing negative effects associated with accounting discretion that could be used opportunistically. Goodwill impairment and associated IAS 38 have attracted the attention of academics and practitioners for its complexity and inherent discretion and judgement while evaluating goodwill impairment. The evidence from the US document that goodwill impairment losses are informed by both economic facts and managerial opportunism (Chen, Kohlbeck and Warfield, 2008; Li *et al.*, 2011; Godfrey and Koh, 2009; Beatty and Weber, 2006). Similarly, evidence from non-US counterparts provide supporting evidence for both opportunistic and economic drivers of goodwill impairment. Chalmers, Godfrey and Webster (2001) document that goodwill impairment reported by Australian entities is related to investment opportunities, whereas Carlin and Finch (2009) implies that management chooses the discount rate for goodwill impairment testing opportunistically, which may result in non-recognition of impairment. With respect to corporate governance, Kabir and Rahman (2016: p. 290) provide evidence that stronger governance mechanisms "strengthens associations between economic factors and goodwill impairment loss but weakens associations between contracting incentives and goodwill impairment loss." This could imply that negative discretion associated with IFRS 9 Expected loss model may be mitigated by adoption of the expected loss model in countries with strong corporate governances structures, or the necessity to improve corporate governance in countries with weak structures currently in place.

Table 5.6: Summarised questionnaire results (Section B).

			Group means				Mann-Whitney U *p*-value		
Question	**N**	**Mean**	**Group 1**	**Group 2**	**Group 3**	**Kruskal-Wallis *p*-value**	**Gp1 – Gp2**	**Gp2 – Gp3**	**Gp1 – Gp3**
B1	107	2.48	2.50	2.45	2.86	0.357	0.726	0.167	0.214
B2	107	2.77	2.59	2.96	3.43	0.094	0.133	0.093	**0.033***
B3	107	3.24	3.09	3.41	3.79	0.092	0.144	0.082	**0.025***
B4	107	3.55	3.27	3.86	4.14	**0.001****	**0.001****	0.232	**0.001****

Note: Table 5.6 shows the summarised questionnaire results of Section B. The table shows the mean for the sample combined and for each sub-group with regards to questions included in Section B, and p-values for the Kruskal-Wallis and the Mann-Whitney U test.
**, ** indicate statistical significance at 5 and 1 per cent, respectively*
Group 1 = academics; Group 2 = practitioners; Group 3 = participants with qualitative feedback.
Responses are based on a five-point Likert Scale where 1 = strongly agree; 2 = agree; 3 = do not know/neither; 4 = disagree; and 5 = strongly disagree.

Furthermore, participants tend to agree with statement B2 that similarly concerns the notion of objectivity. In other words, participants prefer to rely on objective contractual future cash flow rather than subjective expected future cash flow for recognition of interest income. While these findings indicate that there is strong reliance on objective and verifiable concepts (objective evidence of impairment and contractual cash flows), it is worth noting that the objective of general-purpose financial reporting is decision-usefulness for investors and creditors in capital markets[88]. In other words, the general purpose of decision-usefulness is served by the provision of information relevant to prediction of future cash flows. And in order to provide such information, consideration of future events is greatly justified (Penman, 2009; Yong *et al.*, 2016; Hitz, 2007).

On the other hand, participants tend to prefer a more forward-looking model when results for statement B4 are observed (mean value 3.55 for combined sample), which assesses the incorporation of future events for determination of loan impairment. In addition, disagreement with statement B3 suggests that no preference is given to either of the two loan loss provisioning models, for the reason that both models require collective risk assessment if no indication of individual impairment exists. However, there is an intriguing observation in relation to statement B4, which suggests a preference towards a forward-looking model on the basis of incorporation of future events. If the result for statement B1 is recalled, which suggests that loan loss should be tied to an impairment trigger in the form of an event subsequent to initial loan recognition, it becomes clear that the results for B1 and B4 are contradictory. This could have been caused by a negative wording in statement B4. If this is assumed, then the overall results would favour the IAS

[88] IASB/FASB (Cf.), OB2.

39 Incurred loss model. However, if the Group 3 results are further observed, it becomes evident that preference towards the forward-looking model exists. It would therefore be vital to provide further insights into the usefulness of both models evaluating the accounting characteristics of their respective loan loss provisions. The following two sections evaluate the opinions of participants in relation to IAS 39 Incurred loss model and IFRS 9 Expected loss model.

5.5.3 IAS 39 Incurred loss model (Section C)

As outlined in Section 5.4 above and according to the results presented in Table 5.7 below, on average, participants consider the IAS 39 Incurred loss model to be less timely in recognition of loan losses (statement C1 mean value 2.67) and more restrictive in provisioning for existing credit losses (statement C4 mean value 2.92). This line of findings is strongly in agreement with the arguments presented in the wide range of literature that the IAS 39 Incurred loss model suffers from low timeliness and excessive restrictions in relation to provisioning for existing credit losses (Gebhardt, 2016; Peréz, Salas-Fumas and Saurina, 2008; Laeven and Majnoni, 2003).

Timeliness is one of the enhancing characteristics of financial information (IASB, 2010) and it is defined as "having information available to decision-makers in time to be capable of influencing their decisions" (IASB, 2010: ph. 233). In the context of loan loss provisioning, timeliness often refers to the ability of a particular model to provide for loan losses that could arise after the reporting date but are considered to be significantly probable to occur. This practice has been explicitly hindered by the IAS 39 Incurred loss model and the issue has been raised by several survey participants:

"An incurred loss model doesn't allow entities to reflect the risk, but only the loss incurred due to an event occurring."
"[IAS 39 Incurred loss model] [d]oesn't factor in all available information relevant to 'valuing' a portfolio of loans."

The above arguments raise the issue of timeliness as well as inability to incorporate future default losses into loan loss provisions. While the issue of timeliness was raised within the accounting profession extensively, the introduction of the IAS 39 Incurred loss model can be understood against the background of the prior debate on loan loss provisioning in the US. In 1998, the US SEC issued guidance on loan loss accounting, which should be prudent[89] and not excessive (Beck and Narayanamoorthy, 2013; Wall and Koch, 2000; Ryan, 2007). This view was primarily informed by the loan loss accounting malpractice of SunTrust Banks that overstated their loan loss reserves in an attempt to smooth earnings across the business cycle to portray greater earnings stability (Balla and Rose, 2011). However, increasing loan loss reserves during good times (when earnings are high) could also reflect bank management intention to build up reserves as a precaution against subsequent economic bust. This is also supported by further criticism of the IAS 39 Incurred loss model – that is, its procyclical tendencies. In other words, the Incurred loss model inhibits building up reserves for losses expected to arise after balance sheet date (no matter how likely), and thus exacerbates the fluctuations of the bank's capital (Novotny-Farkas, 2016), as supported by the following statements from survey respondents:

"It [IAS 39 Incurred loss model] underestimate[s] credit risk and have [has] therefore subsequent influence on banking sector capitalization and systemic risk."

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[89] Prudence refers to the exercise of caution when making judgements under conditions of uncertainty (IASB, 2010, ph. 2.16). In other words, prudence implies that assets and revenues are not be overstated, and losses, liabilities and expenses are not understated.

> *"Recognition [of loan losses under the IAS 39 Incurred loss model] is too late and misaligned to reg[ulatory] cap[ital]."*

This issue of pro-cyclicality has also been widely researched in the empirical literature. Loan loss provisions, as the bank's largest operating accrual item, can be used by banks to manipulate earnings and regulatory capital. Given that the IAS 39 Incurred loss model strictly prohibits provisioning for losses expected to occur after the balance sheet date, it results in insufficient and untimely loan loss provisions (Gebhardt, 2016; Peréz, Salas-Fumas and Saurina, 2008; Laeven and Majnoni, 2003). Subsequently, this results in inflation of bank's balance sheet and thus regulatory capital that leads to more favourable positions in terms of financial stability objective. However, the cycle does not stop here. Banks use the excess liquidity to finance further loans and pump more funds into the economy. This then creates conditions where asset prices rise, which further improves banks' balance sheet positions. The evidence documents that banks use loan loss provisions to manage both earnings and regulatory capital (see Section 2.7). Additionally, research has confirmed that aspects of IAS 39 Incurred loss model enhance procyclical tendencies of key bank's variables. Peréz, Salas-Fumas and Saurina (2008) document that the value relevance of net operating income has decreased in relation to both generic and specific LLP after the introduction of *statistical provision*[90]. This finding suggests that the implementation of specific provision contributed towards enhanced quality of accounting information since the determination of LLP should closely be linked to its underlying credit risk, not the bank's earnings. The evidence from Peréz, Salas-Fumas

[90] Statistical provision is the regulation introduced by the Bank of Spain in 2002 with the objective to improve recognition of *ex ante* credit risk. Once a loan is generated, expected credit losses starts to exist and these should be reflected in the risk premium and expected cash flow to be paid by the borrower. However, at the time, banks following IAS 39, were not allowed to provide for these expected losses as part of incurred loss model. For that reason, the Bank of Spain introduced 'statistical provision' to reduce cyclicality of LLP, to improve volatility of banks' earnings, and to enhance awareness of bank's credit risk (Fernández de Lis, Pagés and Saurina, 2001).

and Saurina (2008) also highlights the relevance of expected credit losses in accounting for credit risk and demonstrates the restrictive nature of a ‘loss-event’ criterion.

Table 5.7: Summarised questionnaire results (Section C).

			Group means				Mann-Whitney U *p*-value		
Question	**N**	**Mean**	**Group 1**	**Group 2**	**Group 3**	**Kruskal-Wallis *p*-value**	**Gp1 – Gp2**	**Gp2 – Gp3**	**Gp1 – Gp3**
C1	107	2.67	2.63	2.73	2.29	0.217	0.628	0.113	0.177
C2	107	3.17	2.98	3.37	3.57	**0.040***	**0.038***	0.273	0.056
C3	107	3.10	3.02	3.20	3.43	0.351	0.249	0.202	0.160
C4	107	2.92	2.79	3.06	2.29	**0.009****	0.090	**0.009****	0.051
C5	107	3.12	2.95	3.31	3.36	0.093	**0.022***	0.687	0.079

Note: Table 5.7 shows the summarised questionnaire results of Section C. The table shows the mean for the sample combined and for each sub-group with regards to questions included in Section B, and p-values for the Kruskal-Wallis and the Mann-Whitney U test.
**, ** indicate statistical significance at 5 and 1 per cent, respectively*
Group 1 = academics; Group 2 = practitioners; Group 3 = participants with qualitative feedback.
Responses are based on a five-point Likert Scale where 1 = strongly agree; 2 = agree; 3 = do not know/neither; 4 = disagree; and 5 = strongly disagree.

Further investigation documents that no significant differences exist between the three sub-groups with respect to statement C1 (Kruskall-Wallis *p*-value 0.217). However, there is an indication that differences between the three sub-groups exists in relation to statement C4 (Kruskall-Wallis *p*-value 0.009), and particularly, between practitioners and the sub-group of respondents with qualitative feedback (Mann-Whitney U *p*-value 0.009). Practitioners opine that the IAS 39 Incurred loss model does <u>not</u> prevent banks from provisioning appropriately for existing credit losses (statement C4), whereas the opposite view is held by sub-group 3 respondents, out of which 71 per cent are practitioners. The possible reason for this result could be the use of term 'existing credit losses' in survey questionnaire. According to IAS 39, existing credit losses are only those that arise before the balance sheet date and thus pass the 'loss-event' criterion – thus, existing credit losses are equal to incurred losses. However, this definition is extremely restrictive and ignores the concept of expected credit losses for which reasonable probability of default can be estimated. Thus, under the IFRS 9 Expected loss model, the existing credit losses are equal to expected credit losses. It is therefore suspected that respondents in sub-group 3 have understood the term 'existing credit losses' as a more inclusive concept (= expected credit losses) since these participants are assumed to have greater knowledge about the complexity and issues within loan loss accounting. The results of sub-group 3 are also in line with academics' opinion, which could have interpreted the term existing credit losses as those equal to expected credit losses based on theoretical notions of loan loss accounting.

The results in Table 5.7 above further reveal that survey participants, in general, disagree with statements C2, C3 and C5 (mean values 3.17, 3.10 and 3.12 respectively) concerning the unreasonable prudence, unduly limitation of managerial discretion and constructive management of default risk associated with the IAS 39 Incurred loss model. The findings of statement C2 are particularly surprising since prudence has been negatively linked to timeliness – the more prudent the accounting for loan losses, the less timely the loan loss provisions. The concept of prudence refers to an accounting convention requiring expected risks and losses not to be understated. In relation to the IAS 39 Incurred loss model, it is reasonable to suggest that such risks are understated since the model strictly accounts only for incurred losses. Therefore, the provisions do not reflect a true and fair view of all the facts known to the reporting entity, undermining reliability and faithful representation.

However, the results in Table 5.7 above further indicate significant difference among the three sub-groups (Kruskal-Wallis *p*-value 0.040), and particularly, between academics and practitioners in relation to statement C2 (Mann-Whitney *p*-value 0.038). It can be observed that academics' views about the unreasonableness of prudence is in line with the established relationship between prudence and timeliness (academics tend to agree with both C1 and C2 statements). This could be explained by stronger theoretical knowledge of accounting concepts relative to practitioners' superior technical expertise. This view is also supported by the evidence from Swanson and Gross (1998) that documents different research priorities among accounting academics and practitioners. They show that academics rank financial and managerial aspects of research to be the most important, whereas practitioners consider tax and auditing as more pertinent. Since the objective of financial accounting is to serve the interests of external users, there is a strong emphasis on notions that enhance the decision-usefulness of general-purpose financial reporting. These notions include both fundamental[91] and enhancing qualitative characteristics of financial information which refer to aspects such as timeliness and faithful representation which are fully understood by accounting scholars. On the other hand, practitioners are more likely to be interested in technical research elements such as those served by auditing and/or tax research.

With respect to the results for statement C3 presented in Table 5.7 above, it is evident that survey participants do <u>not</u> agree that the IAS 39 Incurred loss model unduly limits management discretion to signal private information. This finding is consistent among all the three sub-groups examined. However, in contrast, the prior research support the view that more forward-looking models are able to promote signalling of private information (Bushman and Williams, 2012). In other words, models that take into account future expected credit losses provide more opportunity and discretion to communicate and disclose private information to relevant users of financial statements. However, accounting discretion should be thought of as a double-edged sword (Dechow and Skinner, 2000). On one hand, it may enhance discretion and allow management to disclose private information via financial statements. On the other hand, increased discretion may provide more opportunities for misguided accounting practice that can diminish the transparency and reliability of financial information, the most fundamental reason that pushed adoption of the incurred loss model in 1998. For example, Huizinga and Laeven (2012) provide evidence that distressed banks, especially bigger banks, use discretion more over the classification of mortgage-backed securities to improve their

[91] According to IASB Conceptual Framework for Financial Reporting (2010), the fundamental characteristics of financial information are relevance and faithful representation. The Framework further outlines four enhancing qualitative characteristics: comparability, verifiability, timeliness, and understandability.

balance sheet during the US mortgage crisis. This could suggest that the IAS 39 Incurred loss model, by curbing excessive discretion, can have a positive impact during times of financial downturn. However, this view is in contrast with the literature which suspects the Incurred loss model of being responsible for exacerbating lending procyclicality and thus causing financial turmoil in 2007-08. Similar evidence has also emerged from the analysis in Chapter 4 of this thesis, where it is found that bank's size is significant factor in prediction of gross charge-offs in the next accounting period (see Table 4.4 above Model 3 results). Since the IFRS dummy variable[92] is not statistically significant, this relationship is applicable for banks reporting loan losses in accordance with a more forward-looking model.

Therefore, there are indications that survey participants could regard the IAS 39 Incurred loss model as an appropriate tool to restrict excessive discretion which may deliver inaccurate financial information and could be particularly damaging during economic downturn. The survey participants put more emphasis on objective evidence than on communication of private information with relevant stakeholders. This sentiment is also evident in the following argument presented by one of the academic respondents:

> *"However, banks are likely to use discretion differently in determining the 'appropriate' amount of provisions and will also vary in the quantity and quality of related disclosures."*

The above comment clearly suggests that discretion is seen as a negative concept which could be exploited by bank's management to smooth earnings or build reserves during good times. The respondent further suggest that discretion is likely to be used differently

[92] IFRS dummy is equal to '1' if a bank follows IAS 39 Incurred loss model and '0' if a bank follows local EU GAAP.

rather than to communicate private information potentially useful to users of financial statements. It can also be observed that practitioners disagree more with statement C3 (mean value 3.20) than academics (mean value 3.02). Again, this may be explained by stronger theoretical knowledge of discretion among accounting scholars relative to accounting practitioners, and perhaps by stronger awareness of the ‘double-edged’ notion of discretion. However, statistically speaking, the differences between the sub-groups are not present (Kruskal-Wallis *p*-value 0.351).

Accounting discretion has also been tested within statement C5. Here the evaluation attempts to establish how the participants view the increase in loan loss provisions (determined by the IAS 39 Incurred loss model) with respect to the management of risk of default. Prior research provides conclusive evidence that the market reacts positively to loan loss provisions (Beaver *et al.*, 1989; Wahlen, 1994). However, the positive market reaction is strongly conditional on the discretionary element of loan loss provisions. For example, Beaver and Engel (1995) find that the discretionary portion of loan loss provisions is positively related to market value; and Liu and Ryan (1995) provide evidence that increase in loan loss provisions is associated with positive market reaction only in banks with loan portfolios containing a high proportions of loans involving discretion and judgement. Therefore, a discretionary element of loan loss provisions is considered to be ‘good news’ because they signal favourable information about a bank’s ability to manage default risk (Liu, Ryan and Wahlen, 1997). However, such discretion is considerably restricted under the IAS 39 Incurred loss model given its strong reliance on the ‘loss-event’ criterion. This element requires the provisions to be only incurred when the objective evidence of impairment exists. Therefore, there is a limited opportunity to provide discretionary insights into management ability to manage default risk via loan loss accounting.

The results for statement C5 (presented in Table 5.7 above) suggest that, in general, participants disagree with it (mean value 3.12 for combined sample). It is therefore suggested that participants believe that increase in loan loss provisions determined by the IAS 39 Incurred loss model are good indications of a bank's effective management of default risk, which is in contrast with prior research findings. Previous empirical research documents the opposite – in other words, an increase in loan loss provisions when IAS 39 Incurred loss model is applied implies that actual default occurred and thus the management of risk of default is rather poor. However, the survey participants do not agree with C5 statement and it is suspected that this result could have been driven by the negative format used in the statement[93]. However, taken at face value, participants see incurred losses as good indications of management of default risk. That said, Mann-Whitney U test documents that significant difference exists between scholars and practitioners (*p*-value 0.022). In particular, scholars tend to agree with the statement suggesting that they do not view IAS 39 loan loss provisions as an indication of constructive management of default risk. In contrast, both practitioners and participants with qualitative feedback tend to disagree with C5 statement. For example, one participant states:

> *"A lot of banks use discretion to avoid classifying loans as non-performing and thus avoid incurring any provisions [under IAS 39 Incurred loss model]."*

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[93] C5: Considering a bank with an indication of risk default in loan portfolio, increase in IAS 39 loan loss provisions suggests that the banks is **not** dealing with loan default risk constructively.

The statement above documents that discretion can still be exercised by banks operating under IAS 39 Incurred loss model, which could further influence the amount of loan loss provisions. As the respondent suggests, banks could use technical complexities within the standard to avoid incurring loan loss provisions. Such technical knowledge is more likely to be held by practitioners than academics, which could also explain the difference between the two sub-groups.

However, it is worth noting that evidence from Liu, Ryan and Wahlen (1997) documents that all loan loss provisions reported by banks at-risk signal ‘good news’ to stock markets. On the other hand, banks’ not at-risk report negative associations between loan loss provisions and stock market proxies. This evidence underscores the findings for statement C5 since it does assume that a bank is at-risk (“Considering a bank with an indication of risk default in loan portfolio”). Therefore, the overall disagreement with this statement is in line with Liu, Ryan and Wahlen’s (1997) evidence, that the banks at-risk reporting increase in loan loss provisions constructively deal with the risk of default.

Having considered the full array of investigation, the conclusion is that the IAS 39 Incurred loss model does not seem to be a detrimental model for evaluation of credit risk. In particular, participants are explicit that prudence and level of management discretion are at the level which promotes accurate and reliable financial information about loan losses. That said, participants do mention that timeliness has been a concern within the IAS 39 Incurred loss model and may decrease the informativeness of credit risk evaluation. To provide further insights into usefulness of loan loss provisioning models in evaluation of credit risk, the following section considers IFRS 9 Expected loss model and the respective results from the survey questionnaire.

5.5.4 IFRS 9 Expected loss model (Section D)

This section evaluates and examines the results of survey responses for Section D: IFRS 9 Expected loss model. The summarised results for Section D are presented in Table 5.8 below.

By observing the results in Table 5.8 below, it becomes evident that survey participants, in general, do not agree nor disagree with statement D1 that the IFRS 9 Expected loss model provides negative opportunities to engage in earnings management (mean value 3.00 for combined sample). This result is interesting and documents the lack of coherence in terms of engagement in earnings management. On one hand, earnings management may arise from increasing accounting discretion that surely emerges from IFRS 9 Expected loss model. A similar sentiment can also be observed by reviewing changes in loan loss accounting over the past decade. For example, the introduction of IAS 30 in 1991 explicitly removed the option to set up hidden reserves and recognition of a special item for general banking risk (Gebhardt and Novotny-Farkas, 2011). However, accounting for general loan losses was frequently interpreted as allowing banks to provide for potential and thus expected credit losses. Therefore, under IAS 30 the degree of discretion involved in determination of loan losses was relatively high. The subsequent adoption of IAS 39 in 2001, however, introduced the requirement of objective evidence for the loan loss provisions. Expected losses as a result of events anticipated to occur after the balance sheet date could therefore not be recognised.

While the accounting regulators were explicit about the negative consequences associated with increasing discretion for loan loss accounting, the empirical research is less conclusive on the relationship between discretionary loan loss accounting and earnings and regulatory capital management, which supports the findings in the survey questionnaire. The evidence suggest that banks use loan loss provisions to manage their regulatory capital (Collins, Shackelford and Wahlen, 1995), however, no evidence of earnings management has been confirmed (Moyer, 1990; Beatty, Chamberlain and Magliolo, 1995; Ahmed, Takeda and Thomas, 1999). The participants have also expressed their concerns over negative effects associated with increasing discretion, similar to those presented by the regulators:

> *"[IFRS 9 Expected loss model is] [e]asier to manipulate the model parameters for earnings management. Management should not be allowed to 'play' with the model parameters and model governance should be strict and well audited."*

The above argument clearly outlines that the manipulation of factors included in the IFRS 9 Expected loss model may be used opportunistically to engage in damaging earnings management. The participant is further explicit that such practice should not be allowed, and instead loan loss accounting should be strict and well audited.

Accounting discretion should be considered in the context of the business cycle and bank management's behaviour through the cycle. It has been established throughout this thesis that bank's lending behaviour is positively linked to business cycle whereas accounting for credit losses is negatively associated with fluctuations in business cycle. In other words, during economic upturn when banks expand their lending, the amount of credit losses decreases since the respective probability of default also decreases during good times. On the other hand, once the recession hits, lending contracts and credit losses become more significant. Given that the IFRS 9 Expected loss model significantly increases the level of discretion, it mitigates the procyclical tendencies associated with the relationship between business cycle and bank's management lending and provisioning behaviour. The most prominent theories which could explain this behaviour are herding, disaster myopia and the institutional memory hypothesis as discussed in Section 2.6. In particular, herding behaviour occurs when financial institutions base their decision on the actions of other financial institutions, and not on the information available to them (Cipriani and Lusinyan, 2008). In other words, herding results in inefficient prices of financial assets may significantly diverge from their fundamental values. The market pressures for positive performance are even more pronounced during economic expansion when competitors typically report positive results. With the application of the IAS 39 Incurred loss model, such practice was encouraged by under-provisioning based on the loss-event criterion. Therefore, banks strongly focused on short-term profitability without long-term outlook of financial stability objective. It is also suggested that loan loss provisioning in accordance with the IAS 39 Incurred loss model further exacerbated the externalities associated with the institutional memory hypothesis. In other words, the problems with loan default do not emerge until the very end of an economic expansion, however they become significantly problematic during economic downturn. The institutional memory hypothesis suggests that these occurrences are driven by deterioration of bank management ability to evaluate the risk of default over time. Since the IAS 39 Incurred loss model prohibits accounting for future losses, its application accelerates this deterioration despite the last learning experience being vivid in bank's management memory. Therefore, banks reporting under the IAS 39 Incurred loss model rapidly become complacent by reason of having adopted a short-term strategy of profit maximisation. However, it becomes apparent that the survey participants tend to consider discretion as a detrimental factor within IFRS 9 Expected loss model as seen in the following comment from one of the survey respondents.

> *"[S]ome of the [IFRS 9] requirements may require significant judgement to be applied, which may make it difficult to account for appropriately."*

Table 5.8: Summarised questionnaire results (Section D).

			Group means				Mann-Whitney U *p*-value		
Question	**N**	**Mean**	**Group 1**	**Group 2**	**Group 3**	**Kruskal-Wallis *p*-value**	**Gp1 – Gp2**	**Gp2 – Gp3**	**Gp1 – Gp3**
D1	107	3.00	2.96	3.04	3.14	0.835	0.544	0.557	0.703
D2	107	3.38	3.14	3.53	3.79	0.071	**0.023***	0.261	**0.030***
D3	107	2.60	2.64	2.53	2.36	0.218	0.396	0.418	0.129
D4	107	3.18	3.04	3.33	3.71	**0.017***	0.061	0.118	**0.002****
D5	107	3.20	2.98	3.43	3.79	**0.002****	**0.003****	0.055	**0.000****

Note: Table 5.8 shows the summarised questionnaire results of Section D. The table shows the mean for the sample combined and for each sub-group with regards to questions included in Section B, and p-values for the Kruskal-Wallis and the Mann-Whitney U test.
**, ** indicate statistical significance at 5 and 1 per cent, respectively*
Group 1 = academics; Group 2 = practitioners; Group 3 = participants with qualitative feedback.
Responses are based on a five-point Likert Scale where 1 = strongly agree; 2 = agree; 3 = do not know/neither; 4 = disagree; and 5 = strongly disagree.

By observing the results of statement D2 presented in Table 5.8 above, it becomes evident that survey participants tend to disagree that the IFRS 9 Expected loss model introduces stronger incentives to delay the recognition of loan losses (mean value 3.38 for the combined sample). This issue is closely linked to the design of the three-stage impairment model under IFRS 9. In particular, the move from Stage 1 to Stage 2 seem to be problematic. First, all financial instruments are placed into Stage 1 for which 12-month expected credit losses are recognised. Once the credit risk significantly increases, the financial assets are moved into Stage 2 where lifetime expected credit losses should be recognised. Therefore, as long as it can be argued that there is no significant increase in credit risk, financial assets can be kept within Stage 1 where only 12-month credit losses should be recognised. This could result in a situation where bank management avoids placing assets into Stage 2 in order to decrease the amount of loan loss provisions (Gebhardt, 2016). However, survey participants do not opine that IFRS 9 Expected loss model could introduce stronger incentives to delay recognition of loan losses, mostly because of significant difference between Stage 1 and Stage 2/3 loan loss provisions. When the mean values of each sub-group are observed, it becomes evident that practitioners disagree more with statement D2 than scholars (Mann-Whitney U p-value 0.023). This could be explained by the fact that delay of loan loss recognition has been strongly associated with IAS 39 Incurred loss model rather than IFRS 9 Expected loss model and practitioners may see the move from the incurred loss model to expected loss model as a way to remedy this issue. On the other hand, academics are more aware of research evidence that also suggest the issues with the definition of a significant increase of credit risk in IFRS 9. In other words, the literature has pointed to discretion and judgment involved in definition of significant increase of credit risk, which could lead to more opportunities to manage loan loss provisions. This sentiment is presented by the survey participant in his/her feedback about the IFRS 9 Expected loss model:

> *"The problem with IFRS 9 is that it gives the banks the scope for decision making. Some banks may choose to predict losses prudently others may use it as a gateway for reducing provisioning if they underestimate the predicted defaults. The effects of this regulation is more complicated and not clear that is it one-sided."*
>
> *"Expectations and models may be biased leading to underestimation of credit risk."*

The arguments above reiterate the statement in Benston and Wall (2005) that in some periods banks may have an incentive to understate expected losses in order to increase net income; whereas in other periods, they may have incentives to overstate expected losses when earnings are relatively high in order to smooth reported net income. In particular, such practice can be more pronounced with a more forward-looking model involving greater level of discretion and judgment. However, empirical evidence documents that the scope of discretion exercised by a reporting entity does not solely depend on accounting standards (and thus loan loss provisioning model), but even more significantly, on the firm's underlying reporting incentives. Ball, Kothari and Robin (2000) provide evidence that the demand for accounting quality in terms of accounting timeliness and conservativeness differs in different institutional context. They show that common-law accounting income exhibits greater timeliness than code-law accounting income, which documents that reporting entities in common-law countries incorporate losses more rapidly. This could suggest that loan loss provisions determined in accordance with IFRS 9 Expected loss model might exhibit greater accounting quality in common-law countries than in code-law countries. The findings by Ball, Kothari and Robin (2000) further indicate that disclosure in common law countries provides more enhanced framework that could counter the disadvantages associated with increased discretion in IFRS 9 Expected loss model. On this note, Leuz, Nanda and Wysocki (2003) find that countries with relatively dispersed ownership, strong investor protection and large capital markets document lower tendency of earnings management activity.

Therefore, the findings could be explained on the backdrop of the survey questionnaire sample selected. Given that all questionnaire survey participants are based in western countries of the EU, one could assume that these participants have a strong perception of the institutional framework that is designed to provide protection to investors. As a result, the inherent drawbacks of accounting standards are being effectively mitigated. In other words, incentives that could arise from IFRS 9 Expected loss model are anticipated to be lessened by external factors such as ownership structure, investor rights, and legal and institutional enforcement rules.

By observing the results for statement D3 in Table 5.8 above, it becomes evident that participants in average agree that the IFRS 9 Expected loss model significantly increases the monitoring costs of credit risk. Similar findings can be observed across all sub-groups of survey participants, with participants who provided qualitative feedback agreeing with statement D3 most noticeably. That said, the differences between the sub-groups are not statistically significant (Kruskal-Wallis *p*-value 0.218).

Statement D3 is concerned with monitoring costs associated with evaluation of credit risk in accordance with IFRS 9 Expected loss model. As outlined by the standard, the expected loss model entails incorporation of information from past events, current conditions, and reasonable and supportable forecasts in their estimation of expected credit losses (IFRS 9.5.517). Clearly, the model significantly expands the range of information required to be used and thus increases the level of monitoring costs. In particular, the monitoring costs are associated with (1) ongoing monitoring of credit quality; and (2) disclosure requirements. With respect to monitoring of credit quality, there are number of factors that an entity must closely monitor, for example risk of default, changes in expected losses, relative assessment, residual life of instrument, reasonable threshold[94], backstop indicator[95] and qualitative indicators[96]. These elements often involve a high level of judgment and thus the reporting may significantly differ across the reporting entities.

> *"IFRS 9 does incorporate complex models into the loan loss provisioning process taking into account the mostly existing credit risk practices within banks, which is good. Some part of the new standard (mainly the identification of Stage 2 - significant increase in the risk of default) is implemented very differently within the industry which makes it hard to compare."*

The statement above from one of the survey participants reiterates increasing application of judgment within the IFRS 9 Expected loss model, particularly, in relation to the evaluation of significant increase in credit risk. In addition to ongoing monitoring of credit risk, reporting entities are also required to provide disclosure about how they determine that there has been significant increase in credit risk. In other words, reporting entities should disclose information which details the basis for their expected credit loss calculations, how they measure expected credit losses and assess changes in credit risk. Furthermore, reconciliation of the opening and closing expected credit loss amounts and

[94] Reasonable threshold refer to a threshold applied in determining what is considered a significant increase in credit risk. The risk of recognising expected losses too late should be balanced against setting parameters which are too narrow, which will result in financial assets often moving between the different stages.
[95] There is a general presumption that credit risk has significantly increased if contractual payments are more than 30 days past due. However, this presumption can be refuted if there is reasonable and supportable information supporting the argument that credit risk has not significantly increased since initial recognition (IFRS B5.5.19).
[96] In addition to quantitative indicators, qualitative indicators should be also considered, to the extent, they have not already been involved in the quantitative risk assessment.

carrying values of the associated assets should be provided. As discussed throughout this thesis, the expected loss model requires significant judgement and discretion to be applied, which could result in greater manipulation of accounting figures.

> *"The relative test is not helpful, as it is not very intuitive to most (and risks focusing investors on Stage 2 loans that are a lot 'safer' than stage 1 loans). This is exacerbated by the absence of any requirement to disclose the relative shift in default likelihood since initial recognition (so users can understand how close loans are to the significant increase of credit risk threshold), though arguably IAS 1.125/129 disclosures on measurement uncertainty should address this if potentially material."*

The above argument by one of the survey participants articulates the issue associated with the relative test employed to assess for significant increase in the credit risk. In particular, the argument suggests that the test is not helpful, which could be associated with the incentives that drive bank management not to transfer the financial assets from Stage 1 to Stage 2. This is mostly influenced by the strong affinity between Stage 2 and significant deterioration of credit risk. The argument also raises an important point that has not been evaluated by the survey questionnaire – that is, disclosure of the relative shift in default likelihood within Stage 1. In other words, IFRS 9 does not prescribe any requirements to disclose changes in credit risk within the stages of credit risk evaluation. For example, increases or decreases in credit risk of financial assets that do not result in changes of stages of credit risk are not required to be disclosed. However, such disclosure may encompass relevant information for credit risk evaluation – for example, these may document small but continuous increases/decreases in credit risk. The comment above further raises the issue that despite the non-disclosure of relative shift of credit risk within each stage, if such shift is considered material it should be explicitly reported in the financial statements.

> *"Information is material if omitting, misstating or obscuring it could reasonably be expected to influence the decisions that the primary users of general-purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity" (IAS 1, ph. A938).*

The above definition could be interpreted in terms of credit risk reporting and clearly points to the notion that omission of information about credit risk which could influence the decisions of the primary users of financial reports is considered material misstatement. It is therefore important to consider not only the changes in credit risk that lead to shifts from one to another stage of credit risk evaluation, but rather relative changes in credit risk that is materially relevant to users.

Considering the results of statement D4 reported in Table 5.8 above, on average (mean value 3.18), the survey participants tend to disagree that the provisioning for day-one-loss undermines the objectivity of credit risk reporting. The Kruskal-Wallis test also documents that significant differences between the sub-groups exist in relation to statement D4 (p-value 0.017). By observing the results of each sub-group, it becomes evident that academics disagree the least (mean value 3.04), while the participants that provided qualitative feedback disagree the most (mean value 3.71). The difference between the two sub-groups (sub-group 1 and 3) is further strengthened by the result of Mann-Whitney U test (p-value 0.002) that suggest that null hypothesis that the two sub-groups are from identical population is rejected.

The issue of day-one-loss provisioning is associated with the placement of all financial assets into Stage 1 at their origination. Therefore, in accordance with Stage 1, 12-month expected credit losses should be recognised for financial assets in Stage 1. However, this adjustment could conceptually present a problem. At origination, the fair value of a loan is typically represented by the contractual cash flows discounted at the effective interest rate based on contractual cash flows, or by its expected cash flows discounted at the effective interest rate based on expected cash flows. However, once 12-month loan losses are deducted from a loan carrying value, it can be argued whether the 'adjusted' fair value reflects a loan fair value at its origination. This issue has been raised by both FASB and IASB members who argued that day-one-loss "is inconsistent with the definition of an expense, and referred to the belief that the incremental loss that would be recognised is not based on the economics of the transaction but rather on a prudential desire to have a higher level of loan loss reserves reflected in financial reports to investors" (O'Hanlon, Hashim and Li, 2018: p. 10). As per the IASB Conceptual Framework (2010: ph. 4.25(b)), expenses are defined as "decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or incurrences of liabilities that result in decreases in equity, other than those relating to distributions to equity participants". The definition of an expense indicates that outflow or depletion of asset should occur. It could be argued whether there is a reasonable justification for reporting 12-month expected credit losses if the financial has just been initiated. Similarly, it is questionable whether these losses represent true and fair view, or whether they are a tool to decrease bank's balance sheet. As the members of IASB outline:

> *"[We] are unaware of any other area of financial reporting for which a loss and a related valuation allowance are immediately established to reduce the value of a recognised asset that is purchased or originated on market terms" (O'Hanlon, Hashim and Li, 2018: p. 10).*

However, provisioning for day-one-loss could be a way to increase bank's ability to absorb losses without becoming financially distressed (Wall and Koch, 2000). In other words, building reserves from the beginning (from origination of a financial asset) could be regarded as a prudent approach towards loan loss accounting. This argument is in line with findings from Section C, statement C2 which documents that survey participants do not consider an overly prudent approach to be detrimental to loan loss provisioning. However, prudence should be understood as a two-way concept. Firstly, it states that liabilities and losses should not be understated, and secondly, it outlines that assets and income should not be overstated. In terms of loan loss accounting, this means that credit losses should not be understated and financial assets (loans) should not be overstated. Therefore, it can be argued that survey participants put more emphasis on ensuring that financial assets (loans) are not overstated since they regard day-one-loss provisioning not detrimental to objectivity of credit risk reporting. This is an interesting observation and strengthens the argument that building reserves to ensure financial stability may be an important factor in evaluation of credit risk. In other words, IFRS 9 Expected loss model is considered as an efficient tool to dampen procyclicality tendency associated with provisioning that is too little and too late. Therefore, provisioning from origination of a financial asset can also act as a way to curb excessive lending during boom periods. In other words, reducing the carrying value of financial assets from origination is liable to shrink bank's balance sheet and thus may act as a detriment to further credit expansion. This principle is based on expected credit losses being set-up from the time a loan is originated (Stage 1), rather than awaiting 'trigger events' signalling imminent loan default (Cohen and Edwards, 2017).

Furthermore, day-one-loss provisioning can also be justified on the backdrop of considerable evidence which documents the fact that delayed or backward-looking loan loss accounting, such as the practice of incurred loss model, contributes to procyclicality of bank lending. Laeven and Majnoni (2003) find evidence of positive relationship between loan loss provisions and pre-provision earnings, indicating banks using provisions to smooth reported income. Further evidence by Beatty and Liao (2011) shows that the longer the period for loan loss recognition, the worse the impact of recession on bank lending. Similarly, Bushman and Williams (2012) provide evidence that banks with more comprehensive risk-taking discipline report loan loss provisioning which accounts for expected loan losses well ahead. Financial Stability Forum (2009: p. 4) also outline that "earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness". In other words, the IFRS 9 Expected loss model does not solely improve information soundness in relation to primary users of financial statements such as investors and creditors, but also towards regulators to ensure the financial stability objective. However, it is important to remember that the current study does not aim to provide insights in relation to macro-prudential objectives. The focus of this thesis is on the link between the general-purpose financial reporting and evaluation of credit risk for primary users of financial statements (investors and creditors).

The final result of Section D presented in Table 5.8 above is for the statement D5, and it documents that, on average, survey participants disagree that increase in IFRS 9 loan loss provisions does not indicate constructive management of loan loss default[97] (mean value 3.20). In other words, on average, participants regard an increase of IFRS 9 loan loss provisions as an efficient way to deal with loan default for banks at-risk. Clearly, this supports the evidence from Liu, Ryan and Whalen (1997) which documents discretionary loan loss provisions to be good news only in at-risk banks. Considering that IFRS 9 loan loss provisions are significantly more discretionary than loan loss provisions determined

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[97] Statement D5 considers the example of a bank at risk of loan default. This question evaluates the evidence from Liu, Ryan and Whalen (1997) that find loan loss provisions to be 'good news' only for banks at-risk.

by the IAS 39 Incurred loss model, it can be argued that banks reporting increases in IFRS 9 loan loss provisions are accounting for credit risk well ahead. This practice is considered not only prudent but also timely which supports the provisions of value relevant information for credit risk assessment. This is also supported by the findings for statement C1 which indicated that timeliness of IAS 39 Incurred loss model has been insufficient, largely consistent with academic and practitioner literature.

To evaluate further statement D5, the result of the Kruskal-Wallis test is observed suggesting that the sub-groups identified are not drawn from the same population (p-value 0.002). More precisely, it becomes evident that significant differences exist between sub-group of academics and practitioners (p-value 0.003), and between sub-group of academics and participants which provided qualitative feedback (p-value 0.000). By observing the mean values of each sub-group, it becomes evident that participants with qualitative feedback tend to disagree the most with statement D5 (mean value 3.79), whereas academics rather agree with statement D5 (mean value 2.98) – the difference being statistically significant at 1 per cent two-tailed test. In summary, it is concluded that survey participants tend to disagree with statement D5 suggesting that IFRS 9 Expected loss model provides value relevant information for credit risk evaluation.

5.6 Survey questionnaire results overview

The purpose of this section is to outline the final conclusion in relation to the usefulness of IAS 39 Incurred loss model versus IFRS 9 Expected loss model for credit risk assessment. Considering the results of Section C and Section D, it is concluded that survey participants on average do prefer the IFRS 9 Expected loss model for evaluation of credit risk over the IAS 39 Incurred loss model.

This result is primarily driven by the following four elements: (1) limited timeliness of loan loss provisions determined under IAS 39 Incurred loss model; (2) insufficient ability to provide for existing credit losses under IAS 39 Incurred loss model; (3) prudent approach towards loan loss accounting under IFRS 9 Expected loss model; and (4) forward-looking approach towards management of loan default risk under IFRS 9 Expected loss model.

Timeliness together with insufficient ability to provide for existing credit losses under the IAS 39 Incurred loss model have been viewed as the most detrimental to the evaluation of credit risk.

> *"[IAS 39 Incurred loss model] also impacts the credit risk of the lender as the market does not have complete information on the lender's viability given the unknown unknowns of its loan book."*

The argument above from one survey participant reiterates the inability of IAS 39 Incurred loss model to fully reflect all relevant information about credit risk. Such practice is not only detrimental for the reporting entity's financial stability (a bank), but also for existing and prospective shareholders since complete information about credit risk is being withheld. In particular, the Incurred loss model has been accused of delaying the recognition of predictable loan losses (O'Hanlon, 2013) which was predominantly driven by the loss-event criterion. Given that such losses could have been identified and quantified, the practice of loan loss accounting prescribed by IAS 39 raised concerns over the timeliness and relevance of financial information for decision-making. The key issue pronounced in the literature has been the inherent restrictive approach towards recognition of loan losses which leads to significant overstatement of financial assets. The practice of financial assets' impairment became a hot topic following the European

Sovereign Debt Crisis in 2010, and in particular, against the backdrop of Greek government debt. There was a widespread perception that as a result of IAS 39 Incurred loss model, the European banks may have significantly underprovided for loan losses, which negatively impacts their financial stability (Camfeerman, 2015). However, it is noteworthy to mention that the ECB pointed to the importance of distinguishing between incorrect and inconsistent interpretation and application of IAS 39 Incurred loss model. In other words, there are indications in the literature and regulation that certain elements of expected loan losses could have been included in loan loss provisions despite the existence of 'loss-event criterion' under IAS 39. More specifically, the Bank Accounts Directive 86/660/EEC prescribed the practice of recognition of deteriorations in the creditworthiness of individually identifiable debtors. The Directive required banks to create general loan loss allowance that "cover[s] latent risks inherent in the performing loan portfolio" (Gebhardt and Novotny-Farkas, 2018: p. 8). The general loan loss provision clearly demonstrates bank's ability to recognise a forward-looking portion of loan losses. As one of the survey participants states:

> *"You could do a complex model in order to calculate loan loss provisions also within IAS 39, there was nothing that prevents you from doing so but there are nothing that encourage you to do so either."*

The statement above suggests that there are areas within IAS 39 Incurred loss model that could be used to improve timeliness of credit risk reporting. The respondent also states that the standard is not efficient in encouraging reporting entities to engage with complex modelling since the test of objective evidence is a more convenient alternative.

The problem of insufficient ability to provide for existing credit losses is closely linked to 'loss event' criterion and objective evidence of impairment under IAS 39. While these criteria were primarily driven by motivations to prevent earnings management activity, the flip side of the restrictive practice is “too little and too late” loan loss provisioning. While survey participants are explicit about the concern related to insufficient provisioning practice for expected credit losses, the results also document that the objective evidence criterion is favoured by survey respondents (see Section 5.5.2). The results may be contradictory in terms of single coherent loan loss accounting model, but they are not necessarily contradictory in terms of separate accounting notions. In other words, it would be rather difficult (if not impossible) to design a loan loss provisioning model that would combine both the ability to provide for expected credit losses and satisfy the objective evidence criterion. Given that expected credit losses are subject of future probabilities, the objective evidence of impairment would be impossible to be met at the same time. The aspect of objective evidence criterion is closely linked to the other element that relates to the IFRS 9 Expected loss model. The survey participants expressed their preference towards prudent approach of day-one-provisioning within IFRS 9. This finding can be seen in contrast with a recoverable amount criterion that constitutes a foundation of any forward-looking approach in loan loss accounting. According to the criterion, a reporting entity should consider credit losses that are expected but have not yet occurred. It can be argued that day-one-loss provisioning under IFRS 9 ignores this criterion since it does not reflect the time between origination and reporting date of loan losses. In other words, if we assume that the origination and reporting date is the same, do the 12-month credit losses faithfully represent the substance of economic reality? Or, is a reduced carrying value of a financial asset well justified?

However, it appears that the day-one-loss provisioning is viewed as a prudent approach to ensure loan losses are accounted for early to improve financial stability. That said, the objective of general-purpose financial reporting is not to ensure financial stability objectives, but “to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions relating to providing resources to the entity” (Cf. IASB, 2018, 1.2). It could be argued that a prudent approach represented by one-day-loss provisioning can be justified by significant focus devoted to criticism of IAS 39 Incurred loss model on the basis of its procyclical tendencies. In other words, insufficient credit allowances during times of economic expansion and excessive losses experienced during recession resulted in a financial reporting mindset which favours building reserves early. However, it can be argued that placing emphasis on prudential objectives within accounting standard setting does not align with a general-purpose financial reporting objective and can undermine its underlying purpose. “High loan loss allowances are thought to increase banks’ ability to absorb losses without becoming financially distressed or failing if all else is held constant” (Wall and Koch, 2000: p. 4). Bank regulators have been explicit about the importance of building reserves during times of economic prosperity in order to reduce the financial stress once high loan losses occur. During recession, if a bank’s capital ratio falls below regulatory threshold, the bank could either issue new equity capital or reduce its credit risk exposure to remedy the situation. However, both of the options are challenging. Banks experiencing losses and decreasing capital ratio are also likely to suffer from depressed stock valuation – in such circumstances, raising equity is considered to be inappropriate. The second option to reduce credit risk exposure is likely to involve reducing credit generation. This would also affect creditworthy borrowers, which could have further consequences in terms of procyclicality and potentially leading to credit crunch. This argument illustrates the reason why bank regulators prefer to build reserves early despite potential negative consequences in the form of earnings management. This is supported by the empirical evidence documenting that banks are less willing to maintain adequate capital during good times than in bad times (Peek and Rosengren, 1995; Dugan, 2009). Interestingly, Financial Stability Forum (2009: p. 4) justifies early identification of credit losses as "consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness".

The last element that informs the conclusion about the IFRS 9 superiority for credit risk reporting concerns its forward-looking approach towards management of loan default risk. The survey respondents have expressed their beliefs that increases in IFRS 9 loan loss provisions are considered to be 'good news'. In other words, reporting loan loss provisions under IFRS 9 sends positive signals to the market about bank's effective dealing with its risk of default. This finding is interpreted in connection with the result for statement B4 that also supports the notion of incorporation of effects of future events in loan loss accounting (see Section 5.5.2).

The forward-looking approach has been adopted in both the IASB and FASB standards. The principal elements of these standards are (1) elimination of the threshold for the recognition of expected credit losses (loss-event criterion); and (2) use of reasonable and supportable information whilst forecasting expected credit losses. That said, the two standards differ in terms of time-amount provisioning. More specifically, IFRS 9 requires reporting entities to provide for expected credit losses in three stages (see Section 1.4.1.2), while the FASB's requirement involves provisioning for lifetime expected credit losses from the time of origination. As a consequence, the FASB model results in greater amount of provisions being set up initially in comparison to the IFRS 9 Stage 1 which only requires 12-month expected credit losses to be recognised. While the FASB approach is viewed as more prudent, it could lead to excessive provisions from the time of origination. As one of the survey respondents argues:

> *"I think IFRS 9 [Expected loss model] help[s] to assess better the credit risk based on the evolution of the current market situation. Movements between stages, especially towards [Stage] 3 is a good sign that something wrong is going on in the portfolio, or maybe it is time to review the modelling assumption and to adjust them to the current situation."*

The statement above reiterates that movement from one stage to another provides additional information for the users of financial statements to assess credit risk. Given that each stage defines credit risk differently, it is beneficial to have financial assets categorised on the basis of stages of credit risk.

In conclusion, the analysis of the primary data investigation in form of survey questionnaire provides evidence that the IFRS 9 Expected loss model is viewed as a superior approach for credit risk assessment compared to the IAS 39 Incurred loss model. This evidence is consistent with the findings of secondary data investigation which concluded that the predictive ability of the forward-looking model (a proxy for the IFRS 9 Expected loss model) is greater than the predictive ability of the IAS 39 Incurred loss model.

5.7 Conclusion

This chapter presents the findings of the survey questionnaires distributed to accounting and financial scholars and professionals based in the European Union. The chapter provides comprehensive evidence about the views of survey respondents who have necessary knowledge and/or experience with credit risk reporting. The following results have been generated using primary data. First, evidence is found that the timeliness of

IAS 39 Incurred loss model is a detrimental factor to the evaluation of credit risk. This element has been extensively linked to the procyclical tendencies associated with banks' lending behaviour. Secondly, survey participants believe that IAS 39 Incurred loss model is excessively restrictive in terms of provisioning for expected credit losses. This could result in overstatement of financial assets and understatement of loan loss provisions which undermine the relevance and faithful representation of financial information. Thirdly, IFRS 9 Expected loss model is considered to be a prudent approach to loan loss accounting. This factor has been primarily driven by day-one-loss provisioning which is regarded as a way to build reserves early. Taken together, it is more appropriate to overestimate credit loss than to underestimate them. Fourthly, the survey participants regard provisions determined in accordance with IFRS 9 Expected loss model to be good news. Therefore, IFRS 9 provisions signal effective management of risk of default. This could be explained by the tendency of IFRS 9 provisions to build reserves early which are seen as a way to promote financial stability objectives.

This provides a significant contribution to knowledge by suggesting that IFRS 9 Expected loss model is superior in assessment of credit risk when compared to IAS 39 Incurred loss model. While the respondents prefer IFRS 9 Expected loss model that involves greater level of discretion and judgment, they are explicit about their preference towards the concept of objective evidence. This is an indication of concerns over reliability of IFRS 9 provisions emerging from use of discretion and judgment opportunistically. The following chapter concludes this thesis.

Chapter 6 Conclusion

6.1 Introduction

The purpose of this thesis has been to establish a link between general-purpose financial reporting and the stability of the financial sector represented by commercial and investment banks. More precisely, this study examines the usefulness of credit risk reporting rules in the context of investment decision-making. This has been motivated by the recent change in credit risk reporting rules implemented by the IASB in January 2018. In other words, the focus of this thesis is to establish the link between changes in the loan loss accounting system, associated with the move from the IAS 39 Incurred loss model to the IFRS 9 Expected loss model, and the informativeness of credit risk reporting for general-purpose financial reporting. To remind the reader, it is not the aim of this thesis to evaluate prudential aspects associated with changes in loan loss accounting.

This thesis has provided a comprehensive examination of the two loan loss accounting models, namely the IAS 39 Incurred loss model and the IFRS 9 Expected loss model, in the context of credit risk assessment using both primary and secondary data investigation. Particularly, this thesis has attempted to answer the question of which loan loss accounting model is superior in reporting risk of default in bank's loan portfolio. This thesis is one of the first studies that examines the IFRS 9 Expected loss model following its adoption and implementation in January 2018. Therefore, the following have been the objectives of this study: (1) to investigate which loan loss accounting model has superior predictive ability to estimate actual loan losses; (2) to investigate the effect of auditor specialisation on the predictive ability of loan loss provisions to estimate actual loan losses; (3) to investigate the effect of reporting incentives on the predictive ability of loan loss provisions to estimate actual loan losses; and (4) to investigate the effect of bank's credit rating on the predictive ability of loan loss provisions to estimate actual loan losses.

To address these objectives, the following quantitative tests were carried out, namely: Ordinary Least Squares regression, Fixed Effects regression, and non-parametric tests such as Kruskal-Wallis and Mann-Whitney U tests. The secondary data analyses were designed to provide evidence on all four research objectives outlined, whereas the primary data investigation focused on examination of the first research objective in greater depth. More specifically, survey data analyses attempted to provide insights into the relative importance of concepts associated with loan loss provisioning. In addition to these quantitative analyses, this study also ascertained qualitative opinions and views of relevant stakeholders about the loan loss accounting rules. A survey questionnaire was distributed amongst accounting and finance scholars and practitioners based in EU countries to obtain in-depth understanding about (1) factors influencing credit risk evaluation in the context of general-purpose financial reporting; (2) elements of IAS 39 Incurred loss model affecting its usefulness for credit risk assessment; and (3) elements of IFRS 9 Expected loss model affecting its usefulness for credit risk assessment.

Primary data investigation constitutes a significant contribution to existing evidence since no prior research has utilised primary data to examine the usefulness of IFRS 9 Expected loss model in the context of credit risk reporting. Therefore, this study fills a research gap currently present in the literature. Decision to combine both secondary and primary data analyses was informed by one of the limitations – that is, the non-existence of ex post accounting data generated by entities following IFRS 9 at the time of conducting this study.

Additionally, this thesis contributes to the extant literature since it examines the predictive ability of loan loss provisions to evaluate the usefulness of credit risk reporting. Previous studies have primarily focused on accounting concepts such as conservativeness, prudence, timeliness and earnings management to provide evidence on the effect in the context of general-purpose financial reporting (Beck and Narayanamoorthy, 2013; Wall and Koch, 2000; Ryan, 2007; Moyer, 1990; Beatty, Chamberlain and Magliolo, 1995; Peréz, Salas-Fumas and Saurina, 2008; Laeven and Majnoni, 2003). Yet these studies provide limited evidence concerning the usefulness of loan loss accounting in the context of evaluation of credit risk for investment decision-making. In other words, this thesis addresses the ability of loan loss provisions to provide value relevant information for stakeholders involved in credit risk assessment. Therefore, the analysis contained in the current thesis offers insights into whether financial analysts can perform comprehensive credit risk evaluation of individual banks in the context of the recent change in loan loss accounting. In addition, this thesis examines one of the measures designed in response to the global financial crisis 2007-08. Given that this thesis is not concerned with prudential aspect of financial stability, which was widely debated following the crisis, it focuses instead on the element of loan loss accounting. Loan loss accounting has been criticised for delaying credit losses before and during the crisis, which resulted in insufficient credit loss allowances/provisions without representing the real risk of default (Gebrahrdt, 2016; Novotny-Farkas, 2016; Camfferman, 2015). This was the key reason which drove implementation of IFRS 9 Expected loss model in January 2018. Therefore, the current thesis extends the existing literature on loan loss accounting and adds to our knowledge about the relationship between loan loss accounting and the financial stability of financial institutions.

The thesis initially reports the results of secondary data analyses performed using accounting data for 570 EU banks during the time period 2012 – 2016. The secondary data analyses are informed by the accounting market research; there are two quantitative methods used in this study to examine secondary data, namely: (1) Ordinary Least Square regression, and (2) Fixed Effects regression. These methods were employed to test the predictive ability of each loan loss provisioning model, and the significance of additional factors influencing this predictive ability, namely: (i) auditor specialisation, (ii) bank's size, and (iii) bank's credit rating. The findings from these analyses should provide evidence of whether provisions determined in accordance with a forward-looking model in one accounting period (n), a proxy for IFRS 9 Expected loss model, have superior ability to predict actual credit losses in the next accounting period (n+1). This would indicate that the IFRS 9 Expected loss model provides superior information for credit risk assessment for relevant stakeholders. Furthermore, the secondary data analyses provide insights into whether the presence of audit specialists, bank's total assets and credit rating could influence the level of such predictive ability. While OLS regression was initially conducted, the Hausman specification test indicated the presence of endogenous variable in the panel data. This led to a decision to use the fixed effect regression model.

After secondary data analyses were completed, primary data investigation was performed to provide more robust evidence on the usefulness of IFRS 9 Expected loss model for credit risk assessment. The primary data was collected using an online survey questionnaire distributed and completed by accounting and finance scholars and practitioners. The final sample consists of 107 participants, of which 51 participants work in practice with jobs ranging from credit analyst, banker to portfolio manager; and 56 participants working in academia with jobs ranging from lecturers, readers to emeritus professors. Insights were sought about three aspects in the context of loan loss accounting, namely: (i) preference towards the rules governing loan loss provisioning; (ii) usefulness of the IAS 39 Incurred loss model for credit risk evaluation; and (iii) usefulness of the IFRS 9 Expected loss model for credit risk evaluation. The primary data investigation has been primarily motivated by very limited nature of secondary accounting data using IFRS 9 Expected loss model[98]. Therefore, it was hoped that the primary data analyses could address the limitation of secondary data analyses, in particular, the use of proxy for IFRS 9 Expected loss model. Further, it was thought that the findings from survey questionnaires might help to explain the results which emerged from the secondary data analyses.

The remainder of this chapter is structured as follows. Section 6.2 outlines and discusses the key findings that have been documented in this study. Additionally, Section 6.2 stipulates the major conclusions that have been drawn from the analyses conducted. Section 6.3 provides insights into the main limitations of this study. Section 6.4 discusses the future of loan loss accounting and highlights some potential future research ideas on loan loss provisioning. Finally, Section 6.5 concludes this chapter.

6.2 Main findings and contribution to knowledge

6.2.1 Findings from secondary data analyses

This section summarises and discusses the findings of secondary data analyses employed in this study. There are number of conclusions reached from the empirical investigation that are comprehensively presented and discussed in Chapter 4 of the thesis. The secondary data analyses have tested the following four hypotheses:

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[98] Since IFRS 9 came into the effect in January 2018, there has been only one accounting period applying the new loan loss provisioning model.

H1: *The predictive ability of loan loss provision to estimate actual loan losses is greater for provisions estimated using IFRS 9 Expected loss model relative to IAS 39 Incurred loss model.*

H2: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks whose auditor is an industry specialist than in those banks whose auditor is not an industry specialist.*

H3: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in larger banks than in smaller banks, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

H4: *The predictive ability of loan loss provisions to estimate actual loan losses is greater in banks with higher credit rating than in banks with lower credit rating, and this is more pronounced in banks reporting under IFRS 9 Expected loss model.*

Overall, the results indicate that the IFRS 9 Expected loss model has superior ability to provide information relevant to credit risk reporting when compared to the IAS 39 Incurred loss model. In other words and based on the research methods employed, loan loss provisions determined in accordance with IFRS 9 Expected loss model report greater ability to predict future loan losses relative to loan loss provisions determined in line with IAS 39 Incurred loss model. This result is consistent with the majority of existing evidence on the usefulness of forward-looking models in the context of general-purpose financial reporting (Gebrahrdt, 2016; Novotny-Farkas, 2016; Camfferman, 2015; Liu and Ryan, 1995; Beatty and Liao, 2014). However, the prior research has primarily focused on the aspect of accounting quality and did not factor specific decision-making processes into their investigations, unlike this study which puts emphasis on credit risk assessment for investment decision-making. The results of the secondary data investigation are also in line with prior evidence which shows less income smoothing and less timely recognition of losses in the context of IAS 39 loan loss provisions, following the mandatory adoption of IFRS in the EU[99] (Gebhardt and Novotny-Farkas, 2011). While Gebhardt and Novotny-Farkas (2011) document inhibition of earnings management behaviour, they also provide evidence of untimely recognition of losses under IAS 39. In other words, IAS 39 loan loss provisions do not effectively incorporate losses, which could be explained by a strict reliance on the 'loss-event criterion'. Timeliness of accounting information has been shown to be negatively associated with discretion allowed under a particular accounting treatment (Liu and Ryan, 1995; Beaver and Engel, 1996). Given that the IAS 39 Incurred loss model significantly limits the level of accounting discretion on the grounds of loss-event criterion, timeliness of IAS 39 loan loss provisions is considerably restricted. Therefore, by increasing discretion in loan loss accounting, banks could provide more robust financial information about their management of credit risk as stipulated by the signalling hypothesis[100].

The signalling hypothesis can also be interpreted in relation to the predictive ability of loan loss provisions. Loan loss provisions are typically regarded as reserves set-up by

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[99] Since January 2005, All European listed entities are required to prepare consolidated financial statements in accordance with IFRS standards since 1 January 2005. The EU Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 established that all publicly traded community companies would have to prepare their consolidated financial statements in accordance with IFRS, at the latest by 2005.

[100] Signalling hypothesis stipulates that a reporting entity could use accounting discretion to indicate positive management of business conduct. In the context of loan loss accounting, banks could use discretion to show their intention and ability to deal with bad loans and associated risk of default via effective loan loss provisioning.

banks to deal with bad loans in the future. Therefore, increases in loan loss provisions document greater reserves and thus less vulnerability to unexpected credit shocks. Since the IFRS 9 Expected loss model allows for greater level of judgment and discretion, there are more opportunities to signal relevant financial information to stakeholders. This, in turn, increases the predictive ability of IFRS 9 loan loss provisions. In other words, the flexibility inherent in the IFRS 9 Expected loss model allows incorporation of future credit losses into loan loss provisions, otherwise restricted under IAS 39 Incurred loss model and thus remote to relevant stakeholders such as existing and potential investors. This is further strengthened by the fact that loan loss provisions are banks' largest operating accrual item, and therefore, vital in investment decision-making. Given that the prior research also suggests that loan loss provisions determined in accordance with IAS 39 Incurred loss model exhibit pro-cyclical tendencies, restrictive discretion in loan loss accounting could "potentially reinforce the detrimental effect of accounting on financial crises, such as the one in 2007 – 2009" (Marton and Runesson, 2017: p. 178). It is therefore important to consider loan loss accounting in a broader sense; with not only effects on general-purpose financial reporting, but also on overall stability of the financial system. While this thesis solely focuses on the element of general-purpose financial reporting, pro-cyclical tendencies associated with IAS 39 have been vigorously debated in the literature. The extension of this argument is the institutional memory hypothesis which suggests that the ability of banks and other lending institutions to assess default risk and other risks associated with financial instruments deteriorates as time passes since their last 'learning experience[101]' (Furth, 2001). Reducing the incidence of the institutional memory hypothesis means enhancing banks' ability to incorporate relevant

[101] The 'learning experience' refers to the past recession during which banks encountered significant credit losses due to poor risk assessment.

information into loan loss provisions. If banks are restricted in terms of what events can be compounded into LLPs, that will lead to rapid deterioration of learning memory and thus banks' ability to comprehensively evaluate credit risk. Therefore, increasing discretion may also reduce such deterioration of bank's learning memory experienced throughout the lending cycle. In the context of the IFRS 9 Expected loss model, the improvements in deterioration of learning memory are driven by the increased discretion that allows "information from past events, current conditions, and reasonable and supportable forecasts in estimation of expected credit losses" to be incorporated into loan loss provisions (IFRS 9.5.517). In conclusion, the superiority of the predictive ability of loan loss provisions determined in accordance with IFRS 9 Expected loss model is supported by both signalling and institutional memory hypotheses.

Furthermore, the secondary data analyses indicate that the presence of an audit specialist or Big Four auditor is a significant factor influencing the strength of loan loss provisions' predictive ability. While the result is not in line with the Hypothesis 2 and prior evidence which suggests that firms audited by companies with industry-specific reputation have a lower incidence of earnings management and superior accounting informativeness (Wahlen, 1994; Greenwalt and Sinkey, 1988; and Liu and Ryan, 2006), the result of Hypothesis 2 could be explained on the basis of the dominant presence of Big Four auditors in the banking industry. In other words, the term audit specialist defined as PWC and KPMG in this study, may not represent the specialist group of auditors in the banking sector since most banks are audited by Big Four auditor. In addition, prior evidence documents that banks audited by industry specialists report a lower incidence of earnings management and managerial discretionary behaviour (DeBoskey and Jiang, 2012; Wahlen, 1994; Greenwalt and Sinkey, 1988; and Liu and Ryan, 2006) consistent with the

IAS 39 Incurred loss model. This may be counterproductive to the predictive ability of loan loss provisions, which could explain the negative coefficient observed for the relevant interaction variable $LLP \times BIGFOUR_{i,t}$ (-0.018).

With respect to Hypothesis 3, the result indicates that bank's size is not a significant factor influencing the strength of predictive ability of loan loss provisions. Therefore, this result is not in line with prior research which documents that larger banks have stronger incentives to provide more relevant financial information due to the greater incidence of political costs (Jones, 1991; Cahan, 1992; Han and Wang; 1998; Key, 1997). While the support for the Hypothesis 3 has not been established, bank's size has been identified as a relevant factor influencing the amount of gross charge-offs in the next accounting period. The results report negative coefficient which indicates that the larger the bank the smaller the credit losses written off from the loan portfolio. This finding is interesting, and at first sight, it may appear to be contradictory to the way in which banks experience credit losses. It is reasonable to assume that larger banks have greater loan portfolio and thus larger loan loss provisions. However, this relationship does not incorporate actual credit losses or gross charge-offs, which is the next step in the context of loan loss accounting. The credit losses are typically influenced by external factors, rather than internal factors which would normally predict level of loan loss provisions (such as loan loss accounting model). By contrast, actual credit losses are impacted by wider macroeconomic variables outside the control of a reporting entity and thus the level of discretion does not play a role, nor the loan loss accounting model applied. Procyclicality of banks' lending behaviour can also explain the observed relationship between bank's size and loan loss provisioning. Banks typically expand their balance sheet by increasing lending during economic expansion. This is predominantly driven by assumption of continuous economic growth that could further lead to loosening of the lending standards. Thus, during good times banks tend to experience much lower losses since non-performing loans are on fallback. Considering the time period adopted in this thesis (2012 – 2016), it is evident that it is positioned within the economic expansion (Eurostat, 2019). This is also supported by Figure 4.1 depicted on page 185 which shows a decreasing trend of the net tightening of credit standards applied by euro area bank loans to non-financial institutions between 2012 and 2016. In other words, Figure 4.1 on page 185 illustrates that EU banks continuously relaxed their lending standards based on the expectation of positive economic growth and low credit risk. This also suggests that banks experienced low credit losses given their propensity to expand credit provision.

The results for the last hypothesis, Hypothesis 4, provide evidence that the predictive ability of loan loss provisions to estimate actual credit losses is greater for EU banks which hold higher credit rating when compared to EU banks with lower credit rating. There are at least two implications emerging from this evidence. First, credit rating can be regarded as a form of political cost that is greater the larger the bank is. In other words, larger banks tend to experience more sensitivity towards changes in their credit standing given their great capital market exposure. The literature documents that this exposure increases political enforcement (Ball, Kothari and Robin, 2000; Hail and Leuz, 2006; Fonseca and González, 2008; Vyas, 2011), which could also enhance accounting quality "since the enforcement mitigates the effect of firm-specific incentives by limiting opportunities for management to act on such incentives" (Marton and Runesson, 2017: p. 165). Therefore, the result of Hypothesis 4 can be explained on the basis of capital market enforcement which was similarly applied in proposing Hypothesis 3 of this thesis. Consequently, the finding does provide evidence that capital market enforcement impacts not only the quality of accounting information in general as documented in prior research (Barth and Israeli, 2013; Brown, Preiato and Tarca, 2014; Byard, Li and Yu, 2011; Christensen, Hail and Leuz, 2013; Landsman, Maydew and Thornock, 2012), but more specifically, capital market enforcement proxied as bank's credit rating also improves the predictive ability of loan loss provisions.

The second implication emerging from the finding of Hypothesis 4 concerns the pro-cyclicality of bank's loan loss provisioning. Loan loss accounting is viewed as the first line of defence against credit default. Thus, its purpose is to ensure that banks have sufficient allowances in the form of loan loss provisions to cover future credit losses. Given that loan loss provisions are subject to accounting standards, they should be neither excessive nor insufficient since their role is to represent current credit risk exposure. Therefore, when a bank's credit rating improves (deteriorates), loan loss provisions should also reflect this change and should decrease (increase) accordingly. Given that further research documents that the risk is countercyclical, this indicates that credit risk increases (decreases) during recession (expansion) (Amato and Furfine, 2004). Overall, the finding suggests that the predictive ability of loan loss provisions is impacted by capital market enforcement proxied as bank's credit risk, which is strongly procyclical. Therefore, it could be suggested that the ability of loan loss provisions to predict credit losses decreases (increases) during recession (expansion). However, this line of reasoning was not tested as part of the hypotheses testing and thus remains the subject of future research opportunities.

Table 6.1 below shows the results of all hypotheses testing using secondary data.

Table 6.1: Summary of secondary data results.

Hypothesis	Result	Significance level
Hypothesis 1	Not rejected (= Accepted)	1 %
Hypothesis 2	Rejected	n/a
Hypothesis 3	Rejected	n/a
Hypothesis 4	Not rejected (= Accepted)	1 %

Note: Table 6.1 shows summarised results of secondary data analyses for each hypothesis and their respective level of significance.
Source: Constructed by the author.

6.2.2 Findings from primary data analyses

The purpose of primary data investigation using a survey questionnaire has been to address the limitation of secondary data analysis that proxied IFRS 9 Expected loss model using EU local GAAP accounting data. This is due to the limited availability of accounting data accessible at the time of secondary data collection since IFRS 9 came into the effect in January 2018. Therefore, the aim of the survey questionnaire is to establish or refute the support for the results emerging from the secondary data. In average, the survey participants consider the IFRS 9 Expected loss model to be superior in credit risk assessment when compared to the IAS 39 Incurred loss model. This finding has been driven by the results of the key four elements in loan loss accounting, namely: (1) limited timeliness of loan loss provisions determined under IAS 39 Incurred loss model; (2) insufficient ability to provide for existing credit losses under IAS 39 Incurred loss model; (3) prudent approach towards loan loss accounting under IFRS 9 Expected loss model; and (4) forward-looking approach towards management of loan default risk under IFRS 9 Expected loss model.

The survey participants have been explicit about the detriment within IAS 39 Incurred loss model in the context of timeliness of LLPs and ability to incorporate future events into LLPs. This finding is in line with the results of Hypothesis 1 using secondary data where it was established that timeliness of LLPs plays significant role in their predictive ability. In other words, since IAS 39 Incurred loss model considerably limits accounting discretion, bank management is restricted in terms of reporting robust financial information about their management of credit risk. As a result, timeliness of reported figures suffers from a limited ability to provide relevant information about future potential credit losses. This finding indicates that survey participants are well aware of the key limitation of IAS 39 Incurred loss model that has been widely discussed in the literature as 'too little too late' provisioning. Furthermore, the survey participants have also expressed their concerns over the inability of IAS 39 Incurred loss model to incorporate information about future events into loan loss provisions. Similarly, this issue is linked to the rules under IAS 39 Incurred loss model which require loan loss provisions to be set only once a loss has been incurred, that is banks can only provide for a credit risk when there is objective evidence that the impairment has occurred as of balance sheet date. Interestingly, the survey respondents tend to prefer to rely on objectivity concepts in the context of loan loss accounting, such as the preference of contractual cash flows rather than expected cash flow when determining LLPs. This is a noteworthy observation since it shows that, survey participants, on one hand, agree that the credit risk reporting suffers from loss event criterion, and on the other, survey participants prefer the objectivity concepts for loan loss accounting.

The results of survey questionnaire further indicate that credit risk reporting is enhanced by the prudent approach adopted in IFRS 9 Expected loss model. This has been investigated on the principle of day-one-loss adopted as part of IFRS 9 Expected loss model, which requires a reporting entity to provide for credit losses right after origination or purchase of financial asset. This principle requires banks to start building reserves early to improve financial stability. However, the principle of day-one-loss can be interpreted as a one-way only prudent approach to loan loss accounting. In other words, it solely ensures that LLPs are not understated, however, it does not consider whether LLPs could be overstated as a result of 12-month credit losses being set up at first reporting date. It could be argued that this practice is driven by a desire to provide more rather than 'too little too less', and thus to avoid detriments experienced under the IAS 39 Incurred loss model. Again, this result is in line with secondary data findings that indicate concerns over timeliness of LLPs under the IAS 39 Incurred loss model. Since timeliness is primarily affected by inability to incorporate losses early, day-one-loss provisions directly tackles this issue. However, one should not forget that increasing discretion with intention to improve timeliness also increases the likelihood of managers using it opportunistically – an argument often put forward in support of the IAS 39 Incurred loss model[102]. This view is also supported by further evidence from survey research documenting that the respondents do not consider the IFRS 9 Expected loss model to provide negative opportunities to engage in earnings management. Therefore, it appears that survey participants confirm the concept of prudence to its narrow definition which solely ensures that loan loss provisions are not under-estimated. While this may dampen negative effects associated with pro-cyclicality, the expansion of managerial discretion could result in amplified use of earnings management which would undeniably lessen the informativeness of credit risk reporting. Perhaps this is the reason why survey participants prefer reliance on objective aspects in loan loss provisioning given their evidence-based concepts.

[102] The adoption of IAS 39 Incurred loss model has been defended on precisely such reasons – to curb discretionary loan loss accounting following the malpractices of SunTrust Banks to manage their loan loss provisions in 1998 (Gebhardt, 2016).

Against the backdrop of the previous argument, Cohen and Edwards (2017) argue that banks do not accumulate the provisions under the forward-looking model (such as the IFRS 9 Expected loss model). Instead, they suggest that early loss recognition, as operationalised by day-one-loss provisioning, “would accelerate the process of balance sheet clean-up so that banks are in better position to support recovery” (Cohen and Edwards, 2017: p. 49). Furthermore, this could ensure that banks’ capital buffers remain to the point, even once they are reduced in a downturn. The argument by Cohen and Edwards (2017) supports the argument that early provisioning dampens the negative effects of pro-cyclicality and thus improve the financial stability objective.

The last aspect associated with support for the IFRS 9 Expected loss model concerns its forward-looking approach towards management of credit risk. In other words, whereas the IAS 39 Incurred loss model emphasises a loss event criterion, the IFRS 9 Expected loss model is entrenched in the recoverable amount criterion. According to this principle, the carrying amount of loans should not exceed the present value of expected future cash flows in the form of interest and repayment of principal. Clearly, this definition highlights expected future cash flows and thus cash flows anticipated to be incurred after the reporting date, unlike the IAS 39 Incurred loss model. Therefore, thinking about the recoverable amount criterion implies that possible credit losses arising from future events should be accounted for in loan loss provisions. This principle has been adopted as part of the IFRS 9 Expected loss model in the form of a three-stage approach[103] for loan loss provisioning. The implementation of the three-stage approach can be seen as a way to improve incorporation of future events into loan loss provisions, and at the same time, to restrict overly discretionary behaviour. In particular, this is achieved by the prescription of time period considered when computing future credit losses (12-month vs. lifetime credit losses). However, by the same token, the three-stage approach significantly increases the monitoring costs of credit risk. This is predominately associated with the move from Stage 1 to Stage 2 – when significant deterioration of credit quality occurs. The survey participants further raise an issue of relative deterioration in credit quality, that is changes in credit risk not significant enough to trigger movement form one stage to another. The IFRS 9 Expected loss model is silent about such reporting, and no requirement to report small but continuous changes in credit risk currently exists.

6.2.3 Link between the findings from primary and secondary data analyses

The secondary data analyses reveal that the ability of loan loss provisions determined in accordance with IFRS 9 Expected loss model to predict actual loan losses in the next accounting period is superior when compared to the predictive ability of loan losses determined in accordance with IAS 39 Incurred loss model. This finding supports the argument that the restriction of the scope of judgment and discretion in determining loan loss provisions could result in reduced informativeness of loan loss provisions pertinent

[103] Initially, all performing financial instruments are placed in Stage 1, where a reporting entity should recognise 12-month expected credit losses and interest revenue is computed based on gross carrying amount, which does not include deduction of credit allowance. Financial assets remain at Stage 1 until their credit risk significantly increases since the initial recognition when they are moved into Stage 2. For all financial assets at Stage 2, lifetime expected credit losses are recognised and, as at Stage 1, interest revenue is calculated based upon a gross carrying amount. Once there is objective evidence of impairment, financial instruments are placed into Stage 3. Similar to Stage 2, for Stage 3 financial assets lifetime expected credit losses are recognised and interest revenue is computed on amortised cost carrying amount, which is gross amount less credit allowances.

for decision making processes made by users of financial statements (Novotny-Farkas, 2011). In particular, the timeliness of loan loss provisions has suffered the most significantly by the application of IAS 39 Incurred loss model that led to insufficient allowance being set up for expected credit losses. A similar line of evidence is provided by the primary data analyses, in which timeliness under IAS 39 has been pointed out as significantly reduced by the application of the loss-event criterion. The limited timeliness of accounting information about credit risk could have wider negative implications. First, under-provisioning results in inflation of banks' equity that enables banks to generate more lending. More lending further increases credit risk and thus may be detrimental for bank's financial stability, in particular, when sufficient reserves are not built up in a timely manner. Second, the loss-event criterion does not support a prudent approach towards setting reserves early and thus undermine financial stability of banking sector overall. Again, this line of evidence is supported by primary data findings, which document that prudence in the form of day-one-loss provisioning under IFRS 9 Expected loss model does not undermine objectivity of credit risk reporting. In other words, results document that building reserves at loan's origination provides a way to prevent excessive inflation of equity and to ensure reserves are formed before the credit risk materialises. Prudent approach towards loan loss accounting is closely linked to timeliness of expected losses since ensuring provisions for expected losses are built early provides an important accounting treatment to ensure bank's financial stability. This is also supported by the findings from secondary data analyses where it was found that the predictive ability of loan loss provisions is greater in banks with higher credit rating in comparison to banks with lower credit rating. Credit ratings have considerable effect on bank's financial position and stability since economic implications emerging from changes in credit ratings have direct effect on the stock prices and bonds (Holthausen and Leftwich, 1986;

Hand, Holthausen and Leftwich, 1992). It is therefore of bank's management primary concern that good credit rating is maintained. Given that credit ratings are established by external credit rating agencies, which use variety of information to determine credit standing, sufficient reserves for expected credit losses could indicate a positive sign of a bank dealing with its credit risk effectively. This is also supported by the findings from primary data analyses, in which participants' responses indicate that increases in loan loss provisions under IFRS 9 Expected loss model imply constructive dealing with potential credit losses. In other words, increases in loan loss provisions in line with Expected loss model provide positive signals to market participants suggesting that a bank evaluates its credit risk continuously and makes relevant changes to its credit reserves. This is only possible due to the application of recoverable criterion that implies a forward-looking approach for loan loss accounting., According to the recoverable criterion, the expected (not contractual) cash flows are the primary source of information for determination of expected credit losses.

The additional link between the primary and secondary research findings lies in the ability of loan loss provisions determined in line with the IFRS 9 Expected loss model to predict future period losses more accurately when compared to loan loss provisions determined using IAS 39 Incurred loss model. The findings from primary data also indicate that the key detrimental factors within IAS 39 Incurred loss model is its inability to incorporate the effects of future events. This indicates that the survey participants are well aware of the problems associated with inability of Incurred loss model to communicate private information with relevant stakeholders via discretionary provisions. Given that IAS 39 only allows to set the provisions for loan losses that are already incurred as of the date of balance sheet, it precludes provisioning for expected credit losses anticipated to occur after the balance sheet data, no matter how likely. Therefore, no discretionary portion of loan loss provisions can be set when following the principle of loss event criterion. On the other hand, participants value the ability of IFRS 9 Expected loss model to communicate private information delivered by discretionary portion of loan loss provisions as indications of banks dealing with credit risk constructively.

Overall, the findings from secondary research are supported by those from primary research evidence by supporting respective elements of IFRS 9 Expected loss model for more superior credit risk evaluation. More specifically, superiority of the Expected loss model found in secondary research evidence is supported by the following aspects:

1. Increased timeliness of accounting information about potential credit deterioration of loan portfolio.
2. Ability to provide for expected credit losses at origination in order to build reserves early
3. Improved communication of private information via discretionary loan loss provisions
4. Potential to incorporate the effects of future events about credit risk into current loan loss provisions

The following section expands on the implications of the findings from both primary and secondary research for investors' community, financial analysts, financial institutions, regulatory and standard setting bodies and policy makers.

6.2.4 Implications of the findings for relevant stakeholders

This section reviews the findings with respect to implications for the relevant stakeholders identified throughout this thesis. These include investors, financial analysts, financial institutions, regulatory and standard setting bodies and policy makers.

The role of investors and financial analysts is closely interlinked. Investors, as one the participants in the financial markets, are typically interested in investing long term with the belief that the company has strong future prospects. With this in mind, investors decision making is informed by a variety of financial analyses that are based on information provided in financial statements and are generally conducted by financial analysts. Financial analysts play a vital role of information intermediary in the financial markets (Shipper, 1991) by collecting and analysing accounting information with the aim of reducing information asymmetries (Healy and Palepu, 2001) and enhancing market efficiency (Barth and Hutton, 2004). Since the properties of their forecasting ability is conditional on the quality accounting information, including credit risk reporting, it is important to continuously strengthen the level of financial information provision to enable informed decision making. The IASB Conceptual Framework (2015) emphasises *decision usefulness* as a general purpose of financial reporting, in particular towards investors and creditors in capital markets[104]. In other words, the IASB accounting standards should be constructed in a way that supports information provision pertinent for decision-making of investors and creditors. Relevant financial information is capable of making a difference in the decisions made by users by demonstrating its predictive value, confirmatory value or both.

[104] IASB/FASB (Cf.), OB2.

> *'Financial information has predictive value if it can be used as an input to processes employed by users to predict future outcomes.'* (Cf. IASB 2010, QC8)
>
> *'Financial information has confirmatory value if it provides feedback about previous evaluations.'* (Cf. IASB 2010, QC9)

Considering the above definitions, it becomes evident how differently the two models for loan loss provisioning (IAS 39 Incurred loss model and IFRS 9 Expected loss model) exhibit these values. The Incurred loss model, based upon the principle of loss-event criterion that strictly rejects provisioning for expected credit losses from events anticipated to occur after the balance sheet date, solely highlights the confirmatory value. In other words, loan loss provisions determined in line with the Incurred loss model provide information and thus feedback about previous evaluations, in the case of loan loss accounting about previous credit losses. On the other hand, the Expected loss model underpin both confirmatory and predictive values. Given that the Expected loss model significantly broadens the set of information required to determine loan loss provisions, by incorporating information from past events, current conditions, and reasonable and supportable forecasts in the estimation of expected credit losses, it becomes evident that in addition to information about previous credit losses, IFRS 9 loan loss provisions also exhibit ability to assist with prediction of future credit standing.

Therefore, investors and financial analysts could benefit from much wider set of information provided within IFRS 9 loan loss provisions, and thus their relevance for equity valuation could be enhanced. By the same token, it is noteworthy to mention that information overload may result from additional disclosures associated IFRS 9, which may act as a detriment to value relevance. Although economic theory predicts that disclosure improves management transparency (Verrechia, 2001), Clor-Proell, Proell and

Warfield (2014) question additional disclosure as it may lead to information overload and inefficient information processing. It is therefore even more important that financial analysts and investors become familiar with the new standard to ensure efficient use of information provided by reporting entities.

Banks and financial institutions in general act as intermediaries between borrowers and savers, and thus improve economic efficiency by promoting a better allocation of resources. One of the key roles of banks is risk transformation, which involves the process of risk minimisation by various tools such as diversification of investment, screening and monitoring borrowers, and very importantly creating and maintain adequate levels of reserves and capital to ensure unexpected credit losses can be absorbed without any impact on depositors. Given that banks play a crucial role in efficient functioning of financial markets and economy overall, financial institutions are of primary concern of government oversight to ensure their financial stability. The concept of stability of financial institutions is primarily targeted by prudential regulations focused on capital requirements with objective to design measures that help to reduce the procyclicality in the financial sector. Given that financial services closely follow the fluctuations in the business cycle, it becomes evident that exacerbation of business cycle swings can be promoted by non-regulated business conduct. However, the purpose of this thesis was not to evaluate the efficiency of these macro-prudential measures for financial stability, but to focus solely on general-purpose financial reporting measures represented by the shift in loan loss accounting. From the general-purpose financial reporting perspective, the model of loan loss provisioning can equally support the notion of financial stability. This can be explained by its ability to influence the way how reporting entities (banks) recognise loan losses.

> *"Earlier recognition of loan losses could have dampened cyclical moves in the current crisis. Under the current accounting requirements of an incurred loss model, a provision for loan losses is recognised only when a loss impairment event or events have taken place that are likely to result in non-payment of a loan in the future. Earlier identification of credit losses is consistent both with financial statement users' needs for transparency regarding changes in credit trends and with prudential objectives of safety and soundness." (FSF, 2009: p. 4).*

The above statement by the Financial Stability Forum documents that loan loss provisioning plays a crucial role in mitigating negative factors associated with cyclical moves of business cycle. In other words, reporting entities should be allowed to recognised loan losses early (during economic expansions) when their capital reserves are strong and able to put aside significant portion of their equity. This allows for building reserves early and thus enable banks to cover future loan losses once they arise during recession.

To put this in perspective of the findings of this thesis, reporting entities are provided with more opportunities to provide for stronger and more significant reserves for expected loan losses under the IFRS 9 Expected loss model when compared to the IAS 39 Incurred loss model. This is primarily driven by the implementation of recoverable amount criterion (instead of loss-event criterion), which allows reporting entities to incorporate information from past events, current conditions, and reasonable and supportable forecasts in their estimation of expected credit losses. As a result, financial stability of financial institutions, banks and financial sector overall can be enhanced. That said, it is important to add that financial stability improvement, function of loan loss accounting regime, also depends on reporting incentives such as those arising from political cost hypothesis. While this thesis does not confirm that banks with greater exposure to political costs (proxied by bank's size) report loan loss provisions with superior predictive ability, it is confirmed that banks with stronger credit rating do. In other words, banks with more relevant market positions or global-systematically important banks have stronger reporting incentives to ensure that their financial positions are depicted in positive light.

Accounting standard setting bodies and policy makers have an important role in promoting transparency of general-purpose financial reporting. Importantly, financial reporting does not solely act as a decision-making tool to provide relevant information for investors and financial analysis, but equally financial reporting has stewardship function that should enable current shareholders to evaluate business performance. With the increasing application of FVA in accounting standards, critics have pointed to a shifting emphasis from the stewardship function towards the facilitation of investment decision-making (Whittington, 2008; Ronen, 2008; Hitz, 2007). In other words, the shift from the IAS 39 Incurred loss model to the IFRS 9 Expected loss model has brought loan loss accounting significantly closer to the FVA model, which is typically seen as the most reliable approximation of loan economic value; however, was not implemented by IASB on the basis of operationally too challenging. To put it in perspective, a perceived movement from the traditional basis of financial measurement (historical cost) towards FVA can also be implemented in loan loss accounting when loans are recognised at their economic values. However, there are some significant problems with using fair values in loan loss accounting. The application of FVA – particularly through the mark-to-market accounting – entails a considerable range of assumptions and judgments. Some commentators describe FVA as being ‘fictional’ and ‘imaginary’ in essence (Casson and Napier, 1997) with a potential to promote manipulation and bias. In addition, loans are not very liquid assets since considerable information asymmetry exists between borrowers and lenders. For that reason, estimation of loan economic value is very difficult.

While the FVA model has not been adopted by the IASB, it is important to reflect upon the general trend in accounting standard setting and the implications for loan loss accounting. Therefore, this thesis could be of value for accounting standard setters and policy makers in terms of evaluation of reliability of information used to provide reasonable forecasts to estimate loan loss provisions under IFRS 9 Expected loss model.

6.2.5 Final conclusions

The following set of conclusions is provided to summarise the findings of this thesis:

(i) Loan loss provisions determined by IFRS 9 Expected loss model exhibit superior predictive ability to estimate actual losses when compared to loan loss provisions determined in line with IAS 39 Incurred loss model.

(ii) IAS 39 loan loss provisioning rules prohibit timely recognition of loan losses.

(iii) IAS 39 loan loss provisioning rules prevent banks from provisioning appropriately for existing credit losses.

(iv) IFRS 9 loan loss provisioning rules provide an opportunity to set reserves prudently by exercising *day-one-loss* provisioning.

(v) IFRS 9 loan loss provisions signal positive information to financial market participants.

(vi) EU banks with higher credit rating report greater predictive ability of loan loss provisions to estimate actual loan losses when compared to EU banks with lower credit rating.

6.2.6 Findings overview and knowledge contribution

Overall, the results of the current thesis document that IFRS 9 Expected loss model is superior for credit risk evaluation when compared to IAS 39 Incurred loss model. This conclusion is reached on the basis of both primary and secondary data investigation used in this thesis.

As predicted by theoretical underpinnings, allowing the incorporation of future events into loan loss provisions improves their informativeness for credit risk evaluation. This is supported by the signalling hypothesis suggesting that a higher level of discretionary loan loss provisions implies bank management's "intention and ability to deal with bad loans" (Beatty and Liao, 2014: p. 355). In other words, permitting banks to implement information from past events, current conditions, and reasonable and supportable forecasts in their estimation of expected credit losses enhances the information potential of loan loss provisions measured as their predictive ability in relation to future credit losses.

In addition, earlier recognition of losses might positively affect inherent pro-cyclicality within the financial sector and dampen negative externalities associated with financial crisis. Timely identification and recognition of credit losses have also been consistent "both with financial statement users' need for transparency regarding change in credit trends and with prudential objective of safety and soundness" (FSF, 2009: p. 4). Therefore, the IFRS 9 Expected loss model has the potential to improve not only aspects of general-purpose financial reporting informativeness but also to enhance financial stability in the banking sector. This is particularly achieved via lessening procyclicality while enhancing the consistency of information provided to investors.

Lastly, the IFRS 9 Expected loss model could slow down deterioration of the ability of loan officers to evaluate and assess risk associated with emergence of the institutional memory hypothesis. Given that bank's 'learning experience' with problem loans is only fresh in bank's management memory in the beginning of economic cycle which significantly deteriorates towards the end of expansion – forward-looking provisions forces banks to incorporate credit losses in the long term. Short term provisioning, typical for the IAS 39 Incurred loss model, limits the attention to managing immediately distressed credit only, significantly low during good times. This increases bank's pro-cyclical behaviour beyond its intrinsic potential and results in relaxation of lending standards.

Overall, these findings can be summarised into four main results and constitute our contribution to knowledge embodied in the current thesis. First, loan loss provisions determined in accordance with the IFRS 9 Expected loss model report greater ability to predict future credit losses when compared to loan loss provisions determined in line with the IAS 39 Incurred loss model. Secondly, this predictive ability is not impacted by the bank's size nor by the presence of an industry-specialist during the audit process. Thirdly, the predictive ability of loan loss provisions is influenced by the bank's credit standing; the positive relationship indicates that banks with better credit rating report greater LLPs predictive ability. Fourthly, the survey participants consider the IFRS 9 Expected loss model to provide more relevant information for credit risk evaluation in the context of timeliness and prudence of accounting information.

6.3 Limitations of the study

Although this thesis has made every effort to provide a comprehensive and detailed analysis of the objectives identified in Chapter 1, it nevertheless remains subject to a number of limitations. The most relevant limitation of this thesis is the proxy adopted to measure loan loss provisions determined by the IFRS 9 Expected loss model. Given that at the time of conducting this thesis, there were no secondary accounting data available for IFRS 9, loan loss provisions were proxied in line with EU local GAAPs. A similar method has been adopted by Marton and Runesson (2017: p. 164) arguing that "local [EU] GAAPs lead to earlier recognition of credit losses compared to IFRS in most cases and require more judgment than IFRS". While EU local GAAPs allow for greater discretion in recognition of credit losses, differences exist between individual member states. For instance, under the former loan loss provisioning rules in Denmark, banks were required to create provisions for both unavoidable and foreseeable losses. While this requirement does suggest forward-looking provisioning practice, Danish banks interpreted this requirement "in such a way that the loan balance, net of provisions, should be approximately equal to the current market value" (Gebhardt and Novotny-Farkas, 2011: pp. 297 – 298). Therefore, Danish loan loss accounting rules were very close to FVA which represents the most comprehensive impairment model since it includes all risk factors and provides for both expected and unexpected risks (see Figure 1.2 page 13). This model has significantly wider scope in comparison to IFRS 9 Expected loss model. On the other hand, under Spanish and Portuguese provisioning rules, banks were required to create reserves for every loan, even if there was no evidence of impairment. Again, this does resemble IFRS 9 Stage 1 provisioning, however, additionally, Spanish and Portuguese banks were required to set up statistical provision which was directly linked to the business cycle. Under statistical loan loss provisioning, loan loss reserves are built up during good times, which are then used during economic decline. However, such provisioning rules do not exist under the IFRS 9 Expected loss model.

The second limitation of the current thesis concerns the way banking industry specialist is defined. This study follows DeBoskey (2012) argument that banks are more likely to identify a specialist auditor according to the number of that auditor's clients. While this argument follows the market share approach, this method does not ensure that only auditors with relevant competence in loan loss accounting are identified. In other words, this technique could result in competent auditors with small market share being ignored, or auditors serving competitive industries, such as banking, and generating significant revenues, being automatically considered as specialists without further considerations about their internal knowledge (Neal and Riley, 2004). This could be a serious issue, in particular, when market size is considered. Given that the study evaluates the EU market as a homogeneous group of member states, the differences between individual EU markets are ignored. Consequently, any differences between audit specialists within member states are suppressed. This could be the reason why Hypothesis 2 has been rejected.

One of the possible remedies to this issue is the use of a portfolio share approach which highlights "the relative distribution of audit services and related fees across the various industries for each audit firm considered individually" (Neal and Riley, 2004: p. 170) with further grouping of EU member states according to the size of the audit market. Since audit fees are influenced by the economic performance of each individual EU member state, this approach would allow for identification of an industry specialist based on the assumption that audit fees embody industry-specific knowledge. This method further assumes that a large proportion of revenue is invested into resources in order to further develop industry-relevant knowledge with the aim of maintaining a leading market position. This is certainly a meaningful factor in the context of loan loss accounting given the recent reporting change and significant costs associated with switching from IAS 39 to IFRS 9.

The third limitation of this study concerns the very nature of the banking sector and its importance not only as an investment opportunity, but perhaps more importantly, in the context of financial/economic stability. As stated throughout the thesis, the purpose of this study is to examine and explore the effectiveness of general-purpose financial reporting to promote financial stability via the informativeness of loan loss accounting. However, financial/economic stability of banks is not solely impacted by general-purpose financial reporting, macroprudential regulation plays an equally important role in promoting the financial stability objective. By the same token, this thesis provides unique insights into the link between general-purpose financial reporting and financial sector stability by studying a very narrow, but particularly relevant, aspect of financial reporting. Therefore, while it could be regarded as a limitation, it is certainly also a strength of the study.

Another limitation of this study is the sole focus of primary data collection on the first objective of this thesis. While this may be considered as a limitation, it may equally be seen as an advantage. In other words, the primary data collection and analysis focused on evaluation of the two models for loan loss provisioning with respect to their ability to provide value-relevant information for prediction of expected credit losses. The various factors, as defined by the IASB Conceptual Framework, were tested across the two models to provide more robust insights into usefulness of the two models for credit risk evaluation. Namely, these are (i) presence of objective evidence of impairment; (ii) use of contractual or expected future cash flows in determination of interest income through effective interest rate; (iii) assessment for portfolio impairment; (iv) timeliness of recognition of loan losses; (v) prudence of recognition of loan losses; (vi) level of managerial discretion exercised; (vii) level of earnings management activity; (viii) monitoring cost of credit risk; and (ix) presence of day-one-loss provisioning. That said, the primary data do not examine the objectives 2, 3 and 4 and thus conclusions are solely based upon the examination of secondary data. That said, it is important to say that the conclusions with respect to objective one are robust as they are concluded on the basis of both primary and secondary data analyses.

Further limitation of this thesis concerns the gap between time period selected for secondary data and primary data collection. In other words, secondary data are relevant for time period between 2012 – 2016, whilst primary data were collected during 2019. With that respect, there were some significant changes in the accounting for loan losses. The most important one is the adoption of IFRS 9 in January 2018. Therefore, only at the time of primary data collection, there was a final issue of the Expected loss model in effect. However, it is possible that not all participants were familiar with this standard, which is also reflected in limited provision of qualitative answers in Section C and D of the questionnaire. As discussed earlier, the inability of secondary data to provide accounting information reflecting IFRS 9 Expected loss model, forward-looking loan loss provisions were proxied in line with EU local GAAPs instead (see discussion above on page 284).

Lastly, in relation to primary data investigation, an assumption has been made about participants' knowledge of or experience with loan loss accounting. This assumption is due to the fact that loan loss accounting is a very niche area amongst accounting scholars and practitioners. That said, every effort has been directed towards identification of most relevant respondents who were considered to be sufficiently knowledgeable to provide their opinions and views on loan loss accounting. In addition, it has been ensured that the questionnaire does not use overly technical questions, and thus, is relevant to a wider range of potential respondents.

Nevertheless, despite these limitations, this thesis remains one of the first comprehensive examinations of a very significant topic in credit risk reporting. This study examines the informativeness of credit risk reporting following the replacement of the IAS 39 Incurred loss model by the IFRS 9 Expected loss model. The analyses employed represent a distinctive investigation of loan loss accounting, which to the best of my knowledge, has not been previously conducted. The evaluation of both methodologies provides one of the most comprehensive investigations of informativeness of credit risk reporting rules within the EU area.

6.4 Future research opportunities

The informativeness of credit risk reporting with respect to both loan loss accounting models has been tested by examining the ability of loan loss provisions to predict future credit losses. Further work may examine and test how other proxies have been altered following changes in the loan loss accounting model. For example, conservativeness, earnings management or earnings volatility could be investigated to provide further evidence about the mechanism that drives the relationship between loan loss provisions and bank's earnings quality.

As part of the investigation within this study, the examination of enforcement has been conducted proxied as the bank's size. The assumption has been that larger banks are subject to heightened political scrutiny (Jones, 1991; Cahan, 1992; Han and Wang; 1998; Key, 1997), which could affect the informativeness of loan loss provisions. However, other variables can similarly proxy for the effect of enforcement – for example, accounting quality has been affected by a country-specific effect such as institutional enforcement or the investor protection environment. These aspects could impact the predictive ability of loan loss provisions and could be potentially studied on a broader sample of countries.

The future of loan loss accounting could be reflected upon its past development. The introduction of the IFRS 9 Expected loss model was informed by the limitations inherent in the IAS 39 Incurred loss model. Similarly, the adoption of IAS 39 was influenced by drawbacks in the previous model which was largely accused of promoting earnings management activity. Nevertheless, the past and the present should not be observed in separation, which could suggest that no accounting model is perfect. As others suggest, progress in accounting is not revolutionary but rather evolutionary. The shift in theoretical principles within loan loss accounting should be understood in terms of ongoing social, political and economic changes and not the alleged technical superiority of IFRS 9 Expected loss model over the IAS 39 Incurred loss model. This could explain not only the emergence of a particular accounting model, but also the unprecedented success and wider endorsement by regulators and policy setters.

Furthermore, it could be argued that the adoption of a forward-looking model has been driven by events in the world economy rather than the work of academics or standard setting bodies (Whittington, 2015). The emergence of new industries driven by activities embedded in intangible assets has led to an increasing need for information to reflect the requirements of a globalised economy. Globalisation has placed further emphasis on efficient capital allocation informed by proper assessment of all available information pertinent to rapid decisions. The adoption of IFRS 9 Expected loss model clearly puts emphasis on market values and represents a continuous trend of accounting standards which emphasise decision-usefulness for investment decisions.

"A brave new world in financial reporting" (Ball, 2016: p. 545) and its focus on decision relevance can be regarded as primarily concerned with short-term financial performance given its emphasis on continuous price movement in capital markets. This view overlooks enduring solvency and stability of a business which instead place emphasis on a conservative and cautious view of the future, acknowledging inherent uncertainty (Perry and Nölke, 2006). On the other hand, decision-relevant information is primarily forward-looking in order to be pertinent to future cash flow predictions. This feature is also inconsistent with the argument about stewardship-relevant information which should be capable of verification in order to be fully effective for stewardship purposes. While IFRS 9 Expected loss model may be decision useful, its verifiability, is not met. The essence of IFRS 9 Expected loss model is to derive estimates about the future foreseeable credit losses.

6.5 Conclusion

As part of the final Chapter of this thesis, it is ensured that it presents the final conclusions about the findings of the study. Section 6.2 concludes and summarises the key findings of this thesis from both secondary and primary data analyses, and further stipulates conclusions with regards to the objectives of this study outlined in Chapter 1. Section 6.3 comments upon the main limitations of this study and potential remedies to these drawbacks. Finally, future research opportunities are offered to potential future researchers interested in the topic of credit risk reporting.

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Appendices

Appendix 1: Survey Questionnaire.

The Effect of Loan Loss Provisioning Rules on Financial Analysts' Information Environment

Respondent Information Sheet

You are being invited to take part in research focusing on the evaluation of loan loss provisioning rules set by International Accounting Standards Board (IASB). Dusan Andrejcik, doctoral researcher at the University of Buckingham, is leading this research. Before you decide to take part, it is important you understand why the research is being conducted and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?
The purpose of this study is to understand the consequences of changing loan loss provisioning rules, from the incurred loss model to the expected loss model, on the informativeness of credit risk reporting.

What are the benefits of taking part?
By sharing your opinions and views with us, you will be helping Dusan Andrejcik and The University of Buckingham to better understand the implications of the amendment of loan loss provisioning rules on the assessment of credit risk performed by financial intermediaries and provide further insights for accounting standard setters to improve provisioning rules for loan losses.

Do I have to take part?
No – it is entirely up to you. If you decide to take part, you are free to withdraw your information from the project data set until the data are destroyed on 11 December 2020. You should note that your data may be used in the production of formal research outputs (e.g. journal articles, conference papers, theses and reports) prior to this date and so you are advised to contact the university at the earliest opportunity should you wish to withdraw from the study.

What will happen if I decide to take part?
You will be asked a number of questions regarding loan loss accounting, including past and current rules. The questionnaire can be completed online at a time that is convenient to you. The questionnaire should take around 10 minutes to complete.

What will happen with the results of this study?
The results of this study will be summarised in a study. Quotes or key findings will always be made anonymous in any formal outputs unless we have your prior and explicit written permission to attribute them to you by name.

Data Protection and Confidentiality

Your data will be processed in accordance with the General Data Protection Regulation 2016 (GDPR) and the Data Protection Act 2018. All information collected about you will be kept strictly confidential. Unless they are fully anonymised in our records, your data will be referred to by a unique participant number rather than by name. Your data will only be viewed by the research team that consists of lead researcher, primary and secondary supervisor. All electronic data will be stored on a password-protected computer file. The lead researcher will take responsibility for data destruction and all collected data will be destroyed on 11 December 2020.

Data Protection Rights

The University of Buckingham is a Data Controller for the information you provide. You have the right to access information held about you. Your right of access can be exercised in accordance with the General Data Protection Regulation and the Data Protection Act 2018. You also have other rights including rights of correction, erasure, objection, and data portability. For more details, including the right to lodge a complaint with the Information Commissioner's Office, please visit www.ico.org.uk.

Key contacts

Dusan Andrejcik
Doctoral Researcher
University of Buckingham
Hunter Street
Buckingham
MK18 1EG
0802442@buckingham.ac.uk

If you still have concerns and wish to make a formal complaint, please write to primary or secondary supervisor of this research:

Dr Gurcharan Singh Pritam Singh
Reader in Finance
University of Buckingham
Hunter Street
Buckingham
MK18 1EG
Gurcharan.Singh@buckingham.ac.uk

Dr Anwar Halari
Lecturer in Accounting
The Open University
Walton Hall
Milton Keynes
MK7 6AA
Anwar.Halari@open.ac.uk

In your letter please provide information about the research project, specify the name of the researcher and detail the nature of your complaint.

A. Background information

1. Job title: ………………………………………………………………

2. Gender:
   - ☐ Male
   - ☐ Female
   - ☐ Prefer not to say

3. Age group:
   - ☐ 18-30 years
   - ☐ 31-40 years
   - ☐ 41-50 years
   - ☐ Over 50 years

4. Highest level of education completed:
   - ☐ Less than Bachelor’s degree
   - ☐ Bachelor’s degree
   - ☐ Master’s degree
   - ☐ Doctoral degree
   - ☐ Professional qualification
   - ☐ Other: please state ……………………………………………...

5. How many years of experience have you got in working for financial services/wealth management?
   - ☐ Less than 1 year
   - ☐ 1-5 years
   - ☐ 5-10 years
   - ☐ More than 10 years

6. How often do you provide guidance to clients making investment decision?
   - ☐ Regularly
   - ☐ Occasionally
   - ☐ Never

B. Design of loan loss provisioning

How strongly do you agree with the following statements?

1. Recognition of loan losses should always be tied to an objective evidence of impairment trigger in the form of an event subsequent to initial loan recognition.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know/neither
    - ☐ Disagree
    - ☐ Strongly disagree

2. Recognition of interest income through effective interest rate should be based on the contractual future cash flows, **not** the expected future cash flows.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know/neither
    - ☐ Disagree
    - ☐ Strongly disagree

3. If there is no indication of loan impairment at individual level, loans should **not** be assessed for impairment at portfolio level.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know/neither
    - ☐ Disagree
    - ☐ Strongly disagree

4. Impairment model for loan loss provisioning should **not** allow to incorporate the effects of future events expected to occur after the balance sheet date.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know/neither
    - ☐ Disagree
    - ☐ Strongly disagree

C. *IAS 39* Incurred Loss Model

How strongly do you agree with the following statements?

1. The IAS 39 loan loss provisioning rules prohibit timely recognition of loan losses.
   - Strongly agree
   - Agree
   - Do not know/neither
   - Disagree
   - Strongly disagree

2. The IAS 39 loan loss provisioning rules unreasonably emphasise the concept of prudence leading to excessively conservative recognition of loan losses.
   - Strongly agree
   - Agree
   - Do not know/neither
   - Disagree
   - Strongly disagree

3. The IAS 39 loan loss provisioning rules unduly limit management discretion to signal private information.
   - Strongly agree
   - Agree
   - Do not know/neither
   - Disagree
   - Strongly disagree

4. The IAS 39 loan loss provisioning rules prevent banks from provisioning appropriately for existing credit losses.
   - Strongly agree
   - Agree
   - Do not know/neither
   - Disagree
   - Strongly disagree

5. Considering a bank with an indication of risk default in loan portfolio, increase in IAS 39 loan loss provisions suggests that the bank is **not** dealing with loan default risk constructively.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know/neither
    - ☐ Disagree
    - ☐ Strongly disagree

6. What attributes of *IAS 39 Incurred Loss Model* are detrimental to the evaluation of credit risk?

D. *IFRS 9* Expected Loss Model

How strongly do you agree with the following statements?

1. The IFRS 9 loan loss provisioning rules provide negative opportunities to engage in earnings management.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know
    - ☐ Disagree
    - ☐ Strongly disagree

2. The IFRS 9 loan loss provisioning rules introduce stronger incentives to delay the recognition of loan losses.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know
    - ☐ Disagree
    - ☐ Strongly disagree

3. The IFRS 9 loan loss provisioning rules significantly increase the monitoring costs of credit risk.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know
    - ☐ Disagree
    - ☐ Strongly disagree

4. Provisioning for *day-one-loss* undermines the objectivity of credit risk reporting.
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Do not know
    - ☐ Disagree
    - ☐ Strongly disagree

5. Considering a bank with an indication of risk default in loan portfolio, increase in IFRS 9 loan loss provisions suggests that the bank is **<u>not</u>** dealing with loan default risk constructively.
    - Strongly agree
    - Agree
    - Do not know
    - Disagree
    - Strongly disagree

6. What attributes of *IFRS 9 Expected Loss Model* are detrimental to the evaluation of credit risk?

Appendix 2: Standard Ethical Approval Form.

ETHICS 1

STANDARD ETHICAL APPROVAL FORM

THE UNIVERSITY OF BUCKINGHAM

This form should be completed for every research project that involves human participants. It can also be used to identify whether a full application for ethics approval needs to be submitted. The researcher or, where the researcher is a student, the supervisor, is responsible for exercising appropriate professional judgement in this review. This checklist must be completed **before** potential participants are approached to take part in any research.

SECTION 1 - RESEARCH CHECKLIST

1.1	**Does the study involve holding personal information (names, attributable information or personal identifiers of any form) on a database?**	~~YES~~/NO
1.2	**Does the study involve participants who are particularly vulnerable or unable to give free and informed consent (children, people with learning disabilities, students in academically dependent relationships)?**	~~YES~~/NO
1.3	**Will it be necessary for participants to take part in the study without their full knowledge and explicit consent (perhaps through covert observation)?**	~~YES~~/NO
1.4	**Will the study involve discussion of sensitive topics (political or religious views, illegal activities, sexual activity, drug use and so forth) that could be uncomfortable to participants or harmful if divulged to others?**	~~YES~~/NO
1.5	**Will the study involve potentially harmful procedures of any kind or be conducted in a hazardous environment that could expose the researchers or participants to higher risk than is encountered in normal life?**	~~YES~~/NO
1.6	**Will financial inducements (cash, vouchers or a prize draws) be offered to participants?**	~~YES~~/NO
1.7	**Will the study involve patients or patient data in the NHS?**	~~YES~~/NO

If you have answered 'NO' to all questions 1.1 to 1.7 above, please complete this form and submit TWO copies to supervisor. Both forms will be stamped as evidence of submission. One copy will be retained by the School for audit/office purposes and the other by the researcher/s. Undergraduate and postgraduate students should include/bind their copy of the form with their research report or dissertation.

If you have answered 'YES' to any of the questions above, you will need to complete a full ethical review form.

ETHICS 1

SECTION 2 PROJECT DETAILS

Title of Project:	The effect of credit risk reporting rules on financial analysts' information environment
Name of Lead Researcher:	Dusan Andrejcik
Status (please circle) :	Postgraduate Research
Names of other Researchers:	
Department:	Buckingham Business School
Email:	0802442@buckingham.ac.uk
Contact Address:	166 Temple Grove Park, Bakers Lane, West Hanningfield, CM2 8LJ
Telephone number:	+447533754811
Start and Estimated End Date of Project:	January 2017 - December 2019

SECTION 3 STUDENTS ONLY

Module name and number	
Supervisor's or Module Leader's name	
Email address	

SECTION 4

Briefly describe the study design to be applied in the project including methods of data collection and data analysis

This study examines the predictive ability of loan loss provisions with respect to actual loan losses in the European Union context. Specifically, we compare the predictive ability of loan loss provision between two models of LLP estimation - incurred-loss model and forward-looking model. This study involves collecting both primary and secondary data. Primary data are collected via questionnaires distributed online to EU academics and financial analysts. Secondary data include accounting variables extracted from publicly available sources. This study uses regression and thematic analyses to analyse the data collected.

SECTION 5 DECLARATION

I/we hereby agree that I/we have read the Buckingham Business School's Ethics Code of Practice and taken reasonable steps to ensure the independence and transparency of this research project. There are no significant conflicts of interest or partiality that may impact on the findings and outputs of my/our research activities.
I/we confirm that all participants will be recruited on the basis of informed consent.

SIGNED: Dušan Andrejčík **DATE:** 03/10/2018

PRINCIPAL RESEARCH INVESTIGATOR

SIGNED: **DATE:** 28/2/2020

SUPERVISOR (WHERE APPROPRIATE)

ETHICS 1

Appendix 3: Results of descriptive statistics (Table 4.1A).

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
GCO	3400	0.000	24547950.877	207218.288	1219618.405	11.029	0.042	153.231	0.084
LLP	3400	-2128931.466	24473549.726	238298.464	1180987.700	10.770	0.042	158.019	0.084
IFRS	3400	0.000	1.000	0.790	0.407	-1.427	0.042	0.036	0.084
SIZE	3400	18570.263	2692538000.000	71009788.679	269142716.947	5.941	0.042	40.150	0.084
AUDIT	3400	0.000	1.000	0.506	0.500	-0.024	0.042	-2.001	0.084
RANK	3400	3.000	8.000	6.253	0.698	-0.963	0.042	3.350	0.084
LOA	3400	0.000	992169000.000	32376286.928	108384959.934	5.386	0.042	32.956	0.084
NPL	3400	0.000	107422171.522	1975852.377	7821216.723	6.885	0.042	57.627	0.084
Valid N (listwise)	3400								

Appendix 4: Results of descriptive statistics (Table 4.1B).

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
GCO	2687	0.000	24547950.877	260014.304	1367087.595	9.796	0.047	120.767	0.094
LLP	2687	-2128931.466	24473549.726	285560.277	1316210.559	9.727	0.047	127.704	0.094
SIZE	2687	18570.263	2692538000.000	87935881.845	300383247.498	5.242	0.047	31.005	0.094
AUDIT	2687	0.000	1.000	0.525	0.499	-0.102	0.047	-1.991	0.094
RANK	2687	3.000	8.000	6.114	0.672	-1.037	0.047	4.243	0.094
LOA	2687	0.000	992169000.000	39570528.969	120732130.578	4.756	0.047	25.407	0.094
NPL	2687	0.000	107422171.522	2463373.084	8732655.389	6.096	0.047	45.005	0.094
Valid N (listwise)	2687								

Appendix 5: Results of descriptive statistics (Table 4.1C).

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
GCO	713	0.000	161550.006	8252.095	18725.838	4.254	0.092	21.540	0.183
LLP	713	-301105.008	2633241.061	60188.380	287422.324	6.376	0.092	42.648	0.183
SIZE	713	26564.799	132972147.359	7222394.097	16213567.739	5.334	0.092	31.949	0.183
AUDIT	713	0.000	1.000	0.432	0.496	0.275	0.092	-1.930	0.183
RANK	713	3.000	8.000	6.777	0.521	-1.586	0.092	6.478	0.183
LOA	713	1023.854	128264973.291	5264185.435	12658948.618	5.898	0.092	41.487	0.183
NPL	713	0.000	4022664.421	138589.906	248316.143	7.350	0.092	90.492	0.183
Valid N (listwise)	713								

Appendix 6: Results of descriptive statistics using normalised data for all banks (Table 4.2).

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
logGCO	2850	0.00000	2.07135	0.09164	0.14070	3.33653	0.04586	20.88770	0.09169
logLLP	2850	0.00000	1.52666	0.19418	0.18772	2.09233	0.04586	8.12974	0.09169
IFRS	2850	0.00000	1.00000	0.82632	0.37890	-1.72363	0.04586	0.97158	0.09169
SIZE	2850	9.82932	21.71375	15.23095	2.44132	0.54109	0.04586	-0.34895	0.09169
AUDIT	2850	0.00000	1.00000	0.50526	0.50006	-0.02106	0.04586	-2.00096	0.09169
RANK	2850	3.00000	8.00000	6.23754	0.71394	-0.94983	0.04586	3.27768	0.09169
logLOA	2850	0.01436	3.24206	1.74988	0.21670	-3.04270	0.04586	18.07871	0.09169
logNPL	2850	0.00000	1.76462	0.73037	0.36630	-0.14209	0.04586	-0.79068	0.09169
Valid N (listwise)	2850								

Appendix 7: Results of Spearman's correlation matrix for all variables (Table 4.3).

			GCO	LLP	IFRS	SIZE	AUDIT	RANK	LOA	NPL
Spearman's rho	GCO	Correlation Coefficient	1.000	.298**	.069**	.051**	.114**	-.179**	.046*	.323**
		Sig. (2-tailed)		0.000	0.000	0.006	0.000	0.000	0.015	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	LLP	Correlation Coefficient	.298**	1.000	.229**	-.206**	0.027	-.384**	.045*	.686**
		Sig. (2-tailed)	0.000		0.000	0.000	0.155	0.000	0.016	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	IFRS	Correlation Coefficient	.069**	.229**	1.000	-0.023	.130**	-.475**	-.291**	.247**
		Sig. (2-tailed)	0.000	0.000		0.210	0.000	0.000	0.000	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	SIZE	Correlation Coefficient	.051**	-.206**	-0.023	1.000	.291**	.296**	.038*	-.359**
		Sig. (2-tailed)	0.006	0.000	0.210		0.000	0.000	0.040	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	AUDIT	Correlation Coefficient	.114**	0.027	.130**	.291**	1.000	-0.015	-.038*	-.101**
		Sig. (2-tailed)	0.000	0.155	0.000	0.000		0.431	0.044	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850

Appendix 6: Results of Spearman's correlation matrix for all variables (Table 4.3) (continued).

			GCO	LLP	IFRS	SIZE	AUDIT	RANK	LOA	NPL
	RANK	Correlation Coefficient	-.179**	-.384**	-.475**	.296**	-0.015	1.000	.146**	-.488**
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.431		0.000	0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	LOA	Correlation Coefficient	.046*	.045*	-.291**	.038*	-.038*	.146**	1.000	.122**
		Sig. (2-tailed)	0.015	0.016	0.000	0.040	0.044	0.000		0.000
		N	2850	2850	2850	2850	2850	2850	2850	2850
	NPL	Correlation Coefficient	.323**	.686**	.247**	-.359**	-.101**	-.488**	.122**	1.000
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		N	2850	2850	2850	2850	2850	2850	2850	2850

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix 8: Results of regression analyses of secondary data (Table 4.4).

(Model 0)

```
. xtreg lngco lnllp ifrs size audit rank lnloa lnnpl

Random-effects GLS regression                   Number of obs     =      2,850
Group variable: id                              Number of groups  =        570

R-sq:                                           Obs per group:
     within  = 0.0328                                         min =          5
     between = 0.3213                                         avg =        5.0
     overall = 0.2064                                         max =          5

                                                Wald chi2(7)      =     365.11
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
       lngco |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnllp |   .0376843   .0179141     2.10   0.035     .0025733    .0727954
        ifrs |  -.0649131   .0242034    -2.68   0.007    -.1123509   -.0174754
        size |   .0236003   .0038018     6.21   0.000     .0161488    .0310518
       audit |   .0807651   .0178038     4.54   0.000     .0458702      .11566
        rank |    -.01907   .0116753    -1.63   0.102    -.0419531    .0038131
       lnloa |  -.0517964   .0158002    -3.28   0.001    -.0827642   -.0208286
       lnnpl |   .1701439   .0125852    13.52   0.000     .1454773    .1948104
       _cons |  -.1109611   .1130694    -0.98   0.326     -.332573    .1106508
-------------+----------------------------------------------------------------
     sigma_u |  .16623801
     sigma_e |  .21965667
         rho |  .36417465   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

(Model 1)

```
. xtreg lngco lnllp ifrs LLPIFRS lnloa lnnpl,fe

Fixed-effects (within) regression               Number of obs     =      2,850
Group variable: id                              Number of groups  =        570

R-sq:                                           Obs per group:
     within  = 0.0637                                         min =          5
     between = 0.1416                                         avg =        5.0
     overall = 0.1052                                         max =          5

                                                F(5,2275)         =      30.98
corr(u_i, Xb)  = -0.3336                        Prob > F          =     0.0000

------------------------------------------------------------------------------
       lngco |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnllp |   .0420665   .0487944     0.86   0.389    -.0536196    .1377527
        ifrs |   .0466859   .1112247     0.42   0.675    -.1714264    .2647983
     LLPIFRS |  -.1651731   .0535616    -3.08   0.002    -.2702077   -.0601384
       lnloa |  -.1473465   .0260506    -5.66   0.000     -.198432    -.096261
       lnnpl |   .2621196   .0220172    11.91   0.000     .2189438    .3052955
       _cons |   .3698821   .1361845     2.72   0.007     .1028234    .6369408
-------------+----------------------------------------------------------------
     sigma_u |   .2484542
     sigma_e |  .22136746
         rho |  .55746225   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(569, 2275) = 4.82                   Prob > F = 0.0000
```

(Model 2)

```
. xtreg lngco lnllp ifrs LLPIFRS audit LLPAUDIT lnloa lnnpl,fe
note: audit omitted because of collinearity

Fixed-effects (within) regression               Number of obs     =      2,850
Group variable: id                              Number of groups  =        570

R-sq:                                           Obs per group:
     within  = 0.0647                                         min =          5
     between = 0.1666                                         avg =        5.0
     overall = 0.1216                                         max =          5

                                                F(6,2274)         =      26.22
corr(u_i, Xb)  = -0.3075                        Prob > F          =     0.0000

------------------------------------------------------------------------------
       lngco |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnllp |   .0294374   .0494773     0.59   0.552    -.0675879    .1264627
        ifrs |   .0475885   .1111938     0.43   0.669    -.1704633    .2656403
     LLPIFRS |  -.1865378   .0553461    -3.37   0.001    -.2950721   -.0780036
       audit |          0  (omitted)
    LLPAUDIT |   .0647442   .0424289     1.53   0.127    -.0184591    .1479475
       lnloa |  -.1489518   .0260643    -5.71   0.000     -.200064   -.0978395
       lnnpl |   .2606394   .0220321    11.83   0.000     .2174342    .3038445
       _cons |   .3766493   .1362169     2.77   0.006     .1095269    .6437718
-------------+----------------------------------------------------------------
     sigma_u |  .24235044
     sigma_e |  .22130285
         rho |  .54530175   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(569, 2274) = 4.49                   Prob > F = 0.0000
```

(Model 3)

```
Fixed-effects (within) regression               Number of obs     =      2,850
Group variable: id                              Number of groups  =        570

R-sq:                                           Obs per group:
     within  = 0.0797                                         min =          5
     between = 0.0051                                         avg =        5.0
     overall = 0.0053                                         max =          5

                                                F(7,2273)         =      28.13
corr(u_i, Xb)  = -0.9066                        Prob > F          =     0.0000

------------------------------------------------------------------------------
       lngco |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnllp |  -.0295253   .1458952    -0.20   0.840     -.315627    .2565764
        ifrs |    .062641   .1103597     0.57   0.570    -.1537753    .2790574
     LLPIFRS |  -.1446003   .0534278    -2.71   0.007    -.2493726   -.0398279
        size |  -.1949999   .0316028    -6.17   0.000    -.2569734   -.1330265
     LLPSIZE |   .0049305   .0095898     0.51   0.607    -.0138752    .0237362
       lnloa |  -.1209053   .0261813    -4.62   0.000    -.1722469   -.0695636
       lnnpl |   .2682557   .0219179    12.24   0.000     .2252746    .3112369
       _cons |    3.20145   .4796996     6.67   0.000     2.260755    4.142145
-------------+----------------------------------------------------------------
     sigma_u |  .60903012
     sigma_e |  .21956579
         rho |  .88497721   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(569, 2273) = 4.40                   Prob > F = 0.0000
```

(Model 4)

```
. xtreg lngco lnllp ifrs LLPIFRS rank LLPRANK lnloa lnnpl,fe

Fixed-effects (within) regression               Number of obs     =      2,850
Group variable: id                              Number of groups  =        570

R-sq:                                           Obs per group:
     within  = 0.0680                                         min =          5
     between = 0.1476                                         avg =        5.0
     overall = 0.1101                                         max =          5

                                                F(7,2273)         =      23.69
corr(u_i, Xb)  = -0.3472                        Prob > F          =     0.0000

------------------------------------------------------------------------------
       lngco |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnllp |   -.357121   .1446427    -2.47   0.014    -.6407665   -.0734756
        ifrs |   .0228944   .1113743     0.21   0.837    -.1955114    .2413003
     LLPIFRS |  -.1045462   .0573115    -1.82   0.068    -.2169346    .0078421
        rank |    -.04499   .0183406    -2.45   0.014    -.0809561    -.009024
     LLPRANK |   .0591737   .0203712     2.90   0.004     .0192256    .0991217
       lnloa |  -.1474776    .026026    -5.67   0.000    -.1985148   -.0964405
       lnnpl |   .2548615    .022124    11.52   0.000     .2114761    .2982469
       _cons |   .6790808   .1838504     3.69   0.000     .3185486    1.039613
-------------+----------------------------------------------------------------
     sigma_u |  .24900661
     sigma_e |  .22096033
         rho |  .55946534   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(569, 2273) = 4.80                   Prob > F = 0.0000
```

(Model 5)

```
. xi:reg lngco lnllp ifrs size audit rank lnloa lnnpl i.year
i.year            _Iyear_2012-2016    (naturally coded; _Iyear_2012 omitted)
```

Source	SS	df	MS			
				Number of obs	=	2,850
				F(11, 2838)	=	87.05
Model	75.4377234	11	6.85797486	Prob > F	=	0.0000
Residual	223.593967	2,838	.078785753	R-squared	=	0.2523
				Adj R-squared	=	0.2494
Total	299.031691	2,849	.104960228	Root MSE	=	.28069

lngco	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnllp	.1900263	.015886	11.96	0.000	.158877	.2211756
ifrs	-.0463234	.0159504	-2.90	0.004	-.077599	-.0150478
size	.026411	.0024423	10.81	0.000	.0216222	.0311998
audit	.0605695	.011279	5.37	0.000	.0384536	.0826855
rank	-.0356549	.0092716	-3.85	0.000	-.0538347	-.0174752
lnloa	-.0039543	.0118038	-0.34	0.738	-.0270992	.0191905
lnnpl	.1066097	.0096183	11.08	0.000	.0877502	.1254692
_Iyear_2013	-.0164106	.016648	-0.99	0.324	-.0490541	.0162328
_Iyear_2014	.0324566	.016914	1.92	0.055	-.0007082	.0656215
_Iyear_2015	.0532635	.0169972	3.13	0.002	.0199355	.0865916
_Iyear_2016	.1307276	.0168882	7.74	0.000	.0976131	.163842
_cons	-.2495206	.0822277	-3.03	0.002	-.4107526	-.0882886

Appendix 9: Results of descriptive statistics of survey questions (Table 5.3).

		B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5
N	Valid	107	107	107	107	107	107	107	107	107	107	107	107	107	107
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.48	2.77	3.24	3.55	2.67	3.17	3.10	2.92	3.12	3.00	3.33	2.59	3.18	3.20
Median		2.00	2.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00
Mode		2	2	4	4	3	4	3	3	3	3	3	2	4	4
Std. Deviation		1.093	1.138	1.148	.983	.898	1.023	.823	.953	.855	.880	.898	.900	.920	.874
Variance		1.195	1.294	1.318	.967	.807	1.047	.678	.908	.730	.774	.807	.810	.846	.763
Skewness		.370	.278	-.187	-.874	.062	-.238	.116	-.429	-.422	.000	-.062	.519	-.289	-.482
Std. Error of Skewness		.234	.234	.234	.234	.234	.234	.234	.234	.234	.234	.234	.234	.234	.234
Kurtosis		-.928	-1.051	-1.128	.213	-.527	-.528	-.358	-.521	-.140	-.518	-.527	-.250	-.622	-.474
Std. Error of Kurtosis		.463	.463	.463	.463	.463	.463	.463	.463	.463	.463	.463	.463	.463	.463
Minimum		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5	5	5	5	5	5	5

Appendix 10: Correlation matrix of primary data (Table 5.4).

		A1	A2	A3	A4	A5	A6	B(AV)	C(AV)	D(AV)
A1	Pearson Correlation	1	-.187	-.235*	-.419**	.485**	.113	.202*	.212*	.198*
	Sig. (2-tailed)		.054	.015	.000	.000	.248	.037	.028	.041
	N	107	107	107	107	107	107	107	107	107
A2	Pearson Correlation	-.187	1	.001	-.012	-.038	-.063	.070	-.102	.096
	Sig. (2-tailed)	.054		.989	.901	.701	.522	.475	.297	.325
	N	107	107	107	107	107	107	107	107	107
A3	Pearson Correlation	-.235*	.001	1	.135	.300**	-.075	.098	.120	-.041
	Sig. (2-tailed)	.015	.989		.164	.002	.445	.316	.216	.676
	N	107	107	107	107	107	107	107	107	107
A4	Pearson Correlation	-.419**	-.012	.135	1	-.221*	-.158	-.028	-.134	-.083
	Sig. (2-tailed)	.000	.901	.164		.022	.104	.776	.168	.394
	N	107	107	107	107	107	107	107	107	107
A5	Pearson Correlation	.485**	-.038	.300**	-.221*	1	.197*	.158	.123	-.007
	Sig. (2-tailed)	.000	.701	.002	.022		.042	.104	.205	.939
	N	107	107	107	107	107	107	107	107	107
A6	Pearson Correlation	.113	-.063	-.075	-.158	.197*	1	-.056	-.029	-.105
	Sig. (2-tailed)	.248	.522	.445	.104	.042		.568	.763	.280
	N	107	107	107	107	107	107	107	107	107
B(AV)	Pearson Correlation	.202*	.070	.098	-.028	.158	-.056	1	.089	.428**
	Sig. (2-tailed)	.037	.475	.316	.776	.104	.568		.362	.000
	N	107	107	107	107	107	107	107	107	107
C(AV)	Pearson Correlation	.212*	-.102	.120	-.134	.123	-.029	.089	1	.263**
	Sig. (2-tailed)	.028	.297	.216	.168	.205	.763	.362		.006
	N	107	107	107	107	107	107	107	107	107
D(AV)	Pearson Correlation	.198*	.096	-.041	-.083	-.007	-.105	.428**	.263**	1
	Sig. (2-tailed)	.041	.325	.676	.394	.939	.280	.000	.006	
	N	107	107	107	107	107	107	107	107	107

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix 11: Results of descriptive statistics of survey question according to the sub-groups (Table 5.5).

(Panel A: Descriptive statistics of Group 1)

		B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5
N	Valid	56	56	56	56	56	56	56	56	56	56	56	56	56	56
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.500	2.589	3.089	3.268	2.625	2.982	3.018	2.786	2.946	2.964	3.143	2.643	3.036	2.982
Median		2.000	2.000	3.000	4.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.500	3.000	3.000
Mode		2.0	2.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
Std. Deviation		1.0787	1.0230	1.0834	.9437	.7523	.9998	.7505	.8679	.7959	.8082	.7729	.7961	.7854	.7975
Variance		1.164	1.046	1.174	.891	.566	1.000	.563	.753	.633	.653	.597	.634	.617	.636
Skewness		.135	.173	-.450	-.974	-.046	-.076	.238	-.427	-.576	.280	-.010	.744	-.297	-.191
Std. Error of Skewness		.319	.319	.319	.319	.319	.319	.319	.319	.319	.319	.319	.319	.319	.319
Kurtosis		-1.246	-1.185	-.864	-.252	-.253	-.358	-.451	-.320	.220	-.850	-.779	.204	-.675	-.837
Std. Error of Kurtosis		.628	.628	.628	.628	.628	.628	.628	.628	.628	.628	.628	.628	.628	.628
Minimum		1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0
Maximum		4.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	4.0	4.0

(Panel B: Descriptive statistics of Group 2)

		B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5
N	Valid	51	51	51	51	51	51	51	51	51	51	51	51	51	51
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.451	2.961	3.412	3.863	2.725	3.373	3.196	3.059	3.314	3.039	3.529	2.529	3.333	3.431
Median		2.000	3.000	4.000	4.000	3.000	4.000	3.000	3.000	3.000	3.000	4.000	2.000	4.000	4.000
Mode		2.0	2.0	2.0	4.0	2.0	4.0	3.0	4.0	4.0	3.0	4.0	2.0	4.0	4.0
Std. Deviation		1.1192	1.2322	1.2029	.9385	1.0407	1.0190	.8949	1.0278	.8830	.9583	.9870	1.0070	1.0328	.9001
Variance		1.253	1.518	1.447	.881	1.083	1.038	.801	1.056	.780	.918	.974	1.014	1.067	.810
Skewness		.618	.211	-.071	-1.076	.031	-.466	-.056	-.581	-.492	-.222	-.345	.467	-.495	-.985
Std. Error of Skewness		.333	.333	.333	.333	.333	.333	.333	.333	.333	.333	.333	.333	.333	.333
Kurtosis		-.552	-1.250	-1.598	1.129	-.901	-.385	-.298	-.541	-.336	-.327	-.365	-.574	-.617	.610
Std. Error of Kurtosis		.656	.656	.656	.656	.656	.656	.656	.656	.656	.656	.656	.656	.656	.656
Minimum		1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Maximum		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

(Panel C: Descriptive statistics of sub-sample of participants with qualitative input)

		B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5
N	Valid	14	14	14	14	14	14	14	14	14	14	14	14	14	14
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.857	3.429	3.786	4.143	2.286	3.571	3.429	2.286	3.357	3.143	3.786	2.357	3.714	3.786
Median		3.000	4.000	4.500	4.000	2.000	4.000	4.000	2.000	3.500	3.000	4.000	2.000	4.000	4.000
Mode		4.0	4.0	5.0	4.0	1.0	4.0	4.0	1.0[a]	4.0	2.0[a]	3.0	2.0	4.0	4.0
Std. Deviation		1.1673	1.5046	1.5777	.6630	1.2666	1.3425	1.0894	1.0690	.7449	1.0271	.9750	1.1507	.6112	.5789
Variance		1.363	2.264	2.489	.440	1.604	1.802	1.187	1.143	.555	1.055	.951	1.324	.374	.335
Skewness		-.359	-.552	-.961	-.151	.433	-.622	-.204	.216	-.731	.172	-.089	.584	-2.165	-2.803
Std. Error of Skewness		.597	.597	.597	.597	.597	.597	.597	.597	.597	.597	.597	.597	.597	.597
Kurtosis		-1.456	-1.286	-.759	-.310	-1.535	-.866	-1.272	-1.098	-.637	-1.298	-1.027	-1.089	4.251	7.679
Std. Error of Kurtosis		1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154
Minimum		1.0	1.0	1.0	3.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0
Maximum		4.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0

Appendix 12: Results of summarised questionnaire results (Table 5.6).

(Kruskal-Wallis results)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of B1 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.357	Retain the null hypothesis.
2	The distribution of B2 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.094	Retain the null hypothesis.
3	The distribution of B3 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
4	The distribution of B4 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp2).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of B1 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.726	Retain the null hypothesis.
2	The distribution of B2 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.133	Retain the null hypothesis.
3	The distribution of B3 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.144	Retain the null hypothesis.
4	The distribution of B4 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp2 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of B1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.167	Retain the null hypothesis.
2	The distribution of B2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.093	Retain the null hypothesis.
3	The distribution of B3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.082	Retain the null hypothesis.
4	The distribution of B4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.232	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of B1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.214	Retain the null hypothesis.
2	The distribution of B2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.033	Reject the null hypothesis.
3	The distribution of B3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.025	Reject the null hypothesis.
4	The distribution of B4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Appendix 13: Results of summarised questionnaire results (Table 5.7).

(Kruskal-Wallis results)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of C1 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.
2	The distribution of C2 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.040	Reject the null hypothesis.
3	The distribution of C3 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.351	Retain the null hypothesis.
4	The distribution of C4 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.
5	The distribution of C5 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.093	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp2).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of C1 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.628	Retain the null hypothesis.
2	The distribution of C2 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.038	Reject the null hypothesis.
3	The distribution of C3 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.249	Retain the null hypothesis.
4	The distribution of C4 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.090	Retain the null hypothesis.
5	The distribution of C5 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.022	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp2 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of C1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.113	Retain the null hypothesis.
2	The distribution of C2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.273	Retain the null hypothesis.
3	The distribution of C3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.202	Retain the null hypothesis.
4	The distribution of C4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.009	Reject the null hypothesis.
5	The distribution of C5 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.687	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of C1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.177	Retain the null hypothesis.
2	The distribution of C2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.056	Retain the null hypothesis.
3	The distribution of C3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.160	Retain the null hypothesis.
4	The distribution of C4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.051	Retain the null hypothesis.
5	The distribution of C5 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.079	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Appendix 14: Results of summarised questionnaire results (Table 5.8).

(Kruskal-Wallis results)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of D1 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.835	Retain the null hypothesis.
2	The distribution of D2 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.071	Retain the null hypothesis.
3	The distribution of D3 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.
4	The distribution of D4 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.017	Reject the null hypothesis.
5	The distribution of D5 is the same across categories of Group.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp2).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of D1 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.544	Retain the null hypothesis.
2	The distribution of D2 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.023	Reject the null hypothesis.
3	The distribution of D3 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.396	Retain the null hypothesis.
4	The distribution of D4 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.061	Retain the null hypothesis.
5	The distribution of D5 is the same across categories of Group (Ac-Pr).	Independent-Samples Mann-Whitney U Test	.003	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp2 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of D1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.557	Retain the null hypothesis.
2	The distribution of D2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.261	Retain the null hypothesis.
3	The distribution of D3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.418	Retain the null hypothesis.
4	The distribution of D4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.118	Retain the null hypothesis.
5	The distribution of D5 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.055	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

(Mann-Whitney U results Gp1 – Gp3).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of D1 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.703	Retain the null hypothesis.
2	The distribution of D2 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.030	Reject the null hypothesis.
3	The distribution of D3 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.129	Retain the null hypothesis.
4	The distribution of D4 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.
5	The distribution of D5 is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Appendix 15: Secondary panel data.

ID	YEAR	GCO	LLP	IFRS	SIZE	KPMGPWC	RANK	LOA	NPL
1	2016	0.09762296	0.16618455	1	17.733297	1	7	4.06258387	1.26528933
1	2015	0.03480038	0.20832307	1	17.850738	1	7	4.13661084	1.24360718
1	2014	0.03729482	0.26162861	1	17.912638	1	7	4.13658557	1.1051151
1	2013	0.01423618	0.22965908	1	17.8977	1	7	4.08435571	1.10287519
1	2012	0.0136149	0.22992054	1	17.915879	1	7	4.10528063	1.10419169
2	2016	0.5355356	0.48579208	1	15.153243	1	6	3.84298752	2.18742999
2	2015	0.66800372	0.86182948	1	15.243419	1	6	4.1706625	2.54907456
2	2014	0.77947074	1.31227773	1	14.965958	1	6	3.46008534	1.76112361
2	2013	1.76147104	2.49724711	1	15.251559	1	6	3.97670152	3.55132065
2	2012	1.07702393	1.34098235	1	15.377506	1	6	4.11495053	2.9447655
3	2016	0.0597301	0.14135806	1	16.365538	1	7	4.40093379	0.43316004
3	2015	0.06152586	0.10234086	1	16.239024	1	7	4.25594633	0.5660516
3	2014	0.09950772	0.05659487	1	16.211388	1	7	4.18955986	0.85856755
3	2013	0.10359486	0.06328273	1	16.228929	1	7	4.27525376	1.07669928
3	2012	0.00932043	0.01043041	1	16.12839	1	7	4.22601648	0.56626166
4	2016	0.03349087	0.23471791	1	17.499166	1	7	4.19630842	1.09167428
4	2015	0.00838971	0.24705225	1	17.479399	1	7	4.15479712	1.05626343
4	2014	0.07526701	0.21164328	1	17.451295	1	7	4.21332731	1.12129931
4	2013	0.00204491	0.25872534	1	17.383921	1	6	4.28566542	1.20052035
4	2012	0.03005285	0.11204483	1	17.241893	1	6	4.37814374	1.33366017
5	2016	0.665592	0.24945826	1	16.83815	1	6	4.51152272	2.4442244
5	2015	0.43660841	0.86893578	1	16.904294	1	6	4.43109954	2.59808049

5	2014	1.17075464	0.33912728	1	17.050315	1	5	4.39963955	2.96951226
5	2013	0.69778939	0.95599825	1	17.219127	1	5	4.56281914	3.19340129
5	2012	0.23475349	1.13866727	1	17.224348	1	5	4.54802953	3.02517267
6	2016	0.67910505	1.16981512	0	14.250035	0	7	4.27157373	1.60059109
6	2015	0.23449725	0.45812207	0	14.240032	0	7	4.41839219	1.15763312
6	2014	0.01526391	0.17607123	0	14.148013	0	7	4.37670624	0.7623327
6	2013	0.17373732	0.07375034	0	13.942813	0	6	4.30844123	0.8321645
6	2012	0.09911022	0.16578813	0	13.782573	0	6	4.10923437	0.67025617
7	2016	0	0.00048388	1	16.632629	1	6	2.18122978	0.00025497
7	2015	0	0.00032995	1	16.73943	1	6	2.22665662	0.00025997
7	2014	0.00030395	0.00033394	1	16.681395	1	6	2.50568192	0.00066078
7	2013	0.03756357	2.9E-05	1	16.631281	1	6	2.64456663	0.03944088
7	2012	0.0296821	3.2999E-05	1	16.772241	1	6	2.82661468	0.11438795
8	2016	0.01304356	0.28909832	1	16.364094	0	7	4.17235268	1.23777202
8	2015	0.01032254	0.14583736	1	16.396242	0	7	4.05536453	1.29176278
8	2014	0.07320213	0.38001943	1	16.517421	0	7	3.99579828	1.37580075
8	2013	0.00903803	0.34546029	1	16.671122	0	7	4.19435653	1.52976095
8	2012	0.01626894	0.36860055	1	16.586562	0	7	4.13703333	1.44802848
9	2016	0.00014699	0.0544058	1	15.405344	1	6	3.16928453	0.24974264
9	2015	0.02695736	0.11950688	1	15.300998	1	6	3.10454107	0.26511509
9	2014	0.10239412	0.0472919	1	15.399424	1	6	3.02428295	0.25773356
9	2013	0.01917302	0.0266283	1	15.556156	1	6	3.01921176	0.35119616
9	2012	0.00550482	0.02396845	1	15.501273	1	6	2.883947	0.39282286
10	2016	0.61622564	0.24375997	1	18.4286	1	6	4.05930996	2.25945262
10	2015	0.99962365	0.57205975	1	18.536408	1	6	3.98478723	2.47817118
10	2014	1.57543905	0.12956579	1	18.686586	1	5	3.87906586	2.86628732

10	2013	1.49979736	0.96874617	1	18.905369	1	5	4.04415916	3.24514694
10	2012	0.67675099	1.03541793	1	18.900929	1	5	4.01552995	3.13334452
11	2016	1.48695023	0.96618238	1	18.040618	1	3	4.14388833	3.82661835
11	2015	0.79750539	1.54468177	1	18.138904	1	3	4.05671249	3.67497828
11	2014	0.35674254	1.18412646	1	18.299089	1	4	4.09765132	3.53894472
11	2013	0.51614028	1.48574414	1	18.436907	1	3	4.54038628	3.46782625
11	2012	0.20455342	1.34891435	1	18.15749	1	3	4.26208291	3.0789085
12	2016	0.00201696	0.11650667	0	14.359584	1	7	4.42250329	0.63680802
12	2015	0.0030952	0.13219688	0	14.346242	1	7	4.35949141	0.97610072
12	2014	0.00731319	0.42579701	0	14.400411	1	7	4.29080204	0.77631899
12	2013	0.00508405	0.04013856	0	14.555672	1	7	4.47282554	0.9119453
12	2012	0.02256645	0.45589266	0	14.493489	1	7	4.44740725	0.97187831
13	2016	0.04852441	0.12058355	1	15.655907	0	7	3.89075322	1.53205653
13	2015	0.0416188	0.20689465	1	15.63353	0	7	3.80464971	1.62421006
13	2014	0.05240078	0.43243869	1	15.695675	0	6	3.77793411	1.65947225
13	2013	0.10607926	0.51183392	1	15.755055	0	6	3.95316961	1.92950823
13	2012	0.05535145	0.59475676	1	15.688809	0	6	3.96289669	1.80244023
14	2016	0.00130115	0.01576015	1	14.257984	1	6	3.36841806	0.48727241
14	2015	0.03516152	0.07884815	1	15.011536	1	7	4.64070604	1.78073627
14	2014	0.93541156	0.94864601	1	14.62994	1	7	4.60300814	2.1913622
14	2013	0.66999881	1.04756563	1	14.403137	1	6	4.3247105	1.96883046
14	2012	0.63019247	0.89903063	1	14.271678	1	6	4.36782112	1.88725493
15	2016	0.01351822	0.01427956	1	17.456049	0	7	4.3416384	0.44107611
15	2015	0.02137492	0.00411851	1	17.42279	0	7	4.18996162	0.4064353
15	2014	0.0337065	0.00565597	1	17.521778	0	6	4.16621618	0.32578533
15	2013	0.01211334	0.06837054	1	17.607259	0	6	4.22085268	0.39498438

15	2012	0.06428286	0.0254611	1	17.623312	0	6	4.10130727	0.30035419
16	2016	0.00440926	0.008235	0	15.942075	0	7	0.8379183	0.07565556
16	2015	0.01025523	0.00973645	0	15.352982	0	7	0.41114627	0.04765237
16	2014	0.00491291	0.01156487	0	15.401704	0	7	0.38519913	0.04381878
16	2013	0.00694086	0.01615284	0	15.459731	0	6	0.41637669	0.05885176
16	2012	0.00971565	0.02612671	0	15.146741	0	6	0.4055471	0.06149765
17	2016	0.0766295	0.18990027	0	15.085652	0	7	4.47678044	0.3512222
17	2015	0.00321782	0.01488467	0	15.131624	0	7	4.41249038	0.41985902
17	2014	0.00797511	0.04839485	0	15.218076	0	7	4.42018042	0.21539118
17	2013	0.00101349	0.06348359	0	15.330493	0	6	4.64152191	0.20023351
17	2012	0.00881305	0.05627069	0	15.241008	0	6	4.51355833	0.12889968
18	2016	0.10351912	0.11276067	1	16.06975	1	7	4.44726034	1.00286175
18	2015	0.07597166	0.14155164	1	15.987756	1	7	4.34754515	0.91789464
18	2014	0.09713125	0.22595639	1	15.995694	1	7	4.40080279	0.98282651
18	2013	0.24382736	0.36157034	1	15.906728	1	6	4.66300827	1.40027172
18	2012	0.42707264	0.43539019	0	15.59918	1	6	4.56616492	1.46859805
19	2016	0.78064923	1.20369066	1	14.425098	0	6	3.89118371	2.90020608
19	2015	0.02771244	0.58875231	1	14.543395	0	6	3.83424789	2.79119044
19	2014	0.04546846	1.03185549	1	14.674782	0	6	3.90842299	2.77604051
19	2013	0	1.27468743	1	14.786767	0	6	4.2676371	3.02041815
19	2012	0.00096553	0.54668859	1	14.639367	0	6	4.35171623	2.85660767
20	2016	0.00406274	0.02228582	1	12.59347	1	6	2.13200743	0.42791847
20	2015	0.01393446	0.23483731	1	12.42079	1	6	2.30450275	0.60130324
20	2014	0.00698753	0.16989719	1	12.135192	1	6	2.62785785	0.69882205
20	2013	0	0.16182034	1	12.095058	1	6	3.11493546	0.79242222
20	2012	0	0.3668213	1	11.689752	1	6	3.13462532	0.64704041

21	2016	1.09813551	0.69585052	1	15.390078	1	6	4.16367841	3.24179461
21	2015	0.86553834	0.74154012	1	15.435531	1	6	4.10482221	3.17400485
21	2014	0.08368836	0.74573251	1	15.544055	1	6	4.12423451	3.06813823
21	2013	0.11467332	1.10427092	1	15.676621	1	6	4.37100293	3.14950727
21	2012	0.18123764	0.57929404	1	15.605446	1	6	4.43068723	2.94767773
22	2016	0	0	1	12.635026	1	6	0.31621486	0
22	2015	0	0	1	12.687405	1	6	0.6679186	0
22	2014	0	0	1	12.589973	1	6	0.45738561	0
22	2013	0	0	1	12.783567	1	6	1.07251914	0
22	2012	0	0	1	12.288511	1	6	0.22882657	0
23	2016	1.10602442	0.64349044	1	14.985955	0	6	3.75804934	2.1206118
23	2015	0.01596193	0.53881115	1	14.837159	0	7	3.7205736	2.03562823
23	2014	0.00242206	0.67164363	1	14.87097	0	7	3.56484494	1.88936776
23	2013	0.0117665	0.79620545	1	15.009019	0	6	3.89684993	1.91422486
23	2012	0.1659008	0.90161395	1	14.756781	0	6	4.21983556	1.90680602
24	2016	0.16551529	0.34486832	1	13.483634	1	6	3.90030842	1.86003802
24	2015	0.01253017	0.40588302	1	13.473819	1	6	3.84087216	1.81878513
24	2014	0.04943281	0.78121254	1	13.562804	1	6	4.05346371	1.89196582
24	2013	0.01941922	0.46307531	1	13.474367	1	6	4.22680297	1.95651288
24	2012	0.29482103	0.46690508	1	13.356326	1	6	4.38312014	2.00356566
25	2016	0.13375524	0.10812948	1	12.194861	1	6	3.42179352	1.39742939
25	2015	0.05361185	0.21915882	1	12.248264	1	6	3.33807922	1.24292993
25	2014	0	0.34886865	1	12.356114	1	6	3.32125381	0.87428303
25	2013	0.04697423	0.59801089	1	12.438924	1	6	3.56741561	1.66773531
25	2012	0.03131842	0.67256175	1	12.381771	1	6	3.68283666	1.60137429
26	2016	0.89815079	0.92090089	1	17.130554	0	6	4.08273178	3.19592326

26	2015	0.4357725	0.51258168	1	17.311605	0	6	3.93693066	2.83156487
26	2014	0.31074629	0.85359201	1	17.655214	0	6	3.92112724	2.6513652
26	2013	0.21458543	1.17971874	1	17.878325	0	6	4.00708101	2.52911538
26	2012	0.20466752	0.70164001	1	17.991136	0	6	4.24157231	2.10161244
27	2016	0.05209517	0.35109903	1	14.200058	0	6	4.07506247	2.02413441
27	2015	0.04431445	0.48969473	1	14.250344	0	6	4.00385949	1.84041423
27	2014	0.03254366	0.43818719	1	14.371873	0	6	3.9944847	1.68151427
27	2013	0.04234372	0.57053651	1	14.478002	0	6	4.34573316	1.98678567
27	2012	0.02541528	0.44887894	1	14.252679	0	6	4.40999595	1.75503203
28	2016	0.22874066	0.60017187	1	13.577417	0	6	4.09114819	2.24105186
28	2015	0.01625025	0.67518024	1	13.589674	0	6	4.02544083	2.19034228
28	2014	0.19387044	0.77250858	1	13.629783	0	6	3.99592713	2.02803219
28	2013	0.01974968	0.85963911	1	13.708461	0	6	4.17894594	1.91891827
28	2012	0.10753066	0.6637436	1	13.615785	0	6	4.30675957	1.87608193
29	2016	0.20230227	0.83300216	1	13.556523	0	6	3.96287269	2.65026267
29	2015	0.04938808	0.78347268	1	13.521517	0	6	3.78845199	2.53231435
29	2014	0.11917052	0.77441652	1	13.750545	0	6	3.82941686	2.46861957
29	2013	0.00939473	0.63635405	1	13.814408	0	6	4.04635397	2.45684774
29	2012	0.0071613	0.99176734	1	13.756385	0	6	4.27206318	2.55633653
30	2016	0.49828552	0.81558028	1	14.696959	0	6	3.9104539	2.78971799
30	2015	0.08432736	1.04171596	1	14.838635	0	6	3.89725548	2.63708345
30	2014	0.03401778	0.78911623	1	14.967697	0	6	4.14043657	2.47948087
30	2013	0.01849589	0.74471776	1	14.898456	0	6	4.39222659	2.54981174
30	2012	0.30442488	0.71568381	1	14.667654	0	6	4.34612259	2.33148737
31	2016	0.1980653	0.07296603	1	12.805189	0	7	2.97776742	1.22087446
31	2015	0.03156165	0.03518663	1	12.901871	0	7	2.56022931	0.78093551

31	2014	0.01431308	0.059748	1	13.483417	0	7	2.44155777	0.57182382
31	2013	0.00793444	0.08013009	1	13.880183	0	7	2.60983131	0.6246922
31	2012	0.00152184	0.10216391	1	13.978455	0	7	2.82856361	0.779368
32	2016	0.20070897	0.36176815	1	16.568472	1	5	3.93004853	1.99905233
32	2015	0.72709295	0.10185508	1	16.525881	1	5	3.8671767	2.44014583
32	2014	0.42569575	1.92784568	1	16.631813	1	5	3.78621109	2.64711953
32	2013	0.51161391	1.37780417	1	16.835924	1	5	3.99792507	2.90146593
32	2012	0.50416469	1.73705897	1	16.898706	1	5	4.07988036	3.02338124
33	2016	0	0.00410755	1	12.96346	1	6	1.80211912	0
33	2015	0	0.00024697	1	12.789827	1	6	0.03334193	0.01009586
33	2014	0	0.00149588	1	12.994347	1	6	0.07114043	0.01227535
33	2013	0	0.00096054	1	12.689691	1	6	0.03306914	0.00829153
33	2012	0	0.00037393	1	12.973129	1	6	0.0360368	0.01191078
34	2016	0.94776265	0.5477115	1	13.441703	1	6	3.97119339	2.20842374
34	2015	0.04596045	0.62484318	1	13.457003	1	6	3.83878588	2.1526683
34	2014	0.41571044	0.81246726	1	13.628814	1	6	3.8423327	2.05698272
34	2013	0.00137805	0.68761541	1	13.783588	1	6	4.10116767	1.96808769
34	2012	0.10605947	0.51633482	1	13.701715	1	6	4.21894232	1.65213143
35	2016	0	0	1	20.519326	1	6	3.54517192	0
35	2015	0	0	1	20.276945	1	6	3.32375866	0
35	2014	0	0	1	20.283566	1	6	3.48664083	0
35	2013	0	0	1	20.454842	1	6	3.76040645	0
35	2012	0	0	1	20.506103	1	6	3.96482223	0
36	2016	0.02379074	0.48270327	1	11.979172	0	6	3.72623309	2.35481619
36	2015	0.01114961	0.57639312	1	11.997931	0	6	3.76701839	2.36875329
36	2014	0.23943807	0.75198479	1	12.01716	0	6	3.77310543	2.37422394

36	2013	0.00087362	0.78616929	1	12.101526	0	6	3.98722138	2.50934053
36	2012	0.02824337	0.86126797	1	11.977317	0	6	4.24194954	2.56415804
37	2016	0.01045515	0.50739515	1	13.485484	0	6	4.34105502	2.71066252
37	2015	0.02859037	0.24321516	1	13.215503	0	6	3.86381071	2.33595797
37	2014	0.01272766	0.57248971	1	13.360568	0	6	3.85378061	2.48657343
37	2013	0.00237518	0.61756713	1	13.431163	0	6	4.04400513	2.7195605
37	2012	0.26591181	1.1457185	1	13.355165	0	6	4.48033925	2.92268039
38	2016	0.03105283	1.68116342	1	14.394015	1	6	3.99360161	2.88511547
38	2015	0.68788586	0.47135085	1	14.342796	1	6	3.83484319	2.65675129
38	2014	0.0084611	0.58952183	1	14.611488	1	6	3.93441929	2.63204099
38	2013	0.0126615	0.64951186	1	14.621611	1	6	4.02888916	2.60244884
38	2012	0.00826872	0.63126912	1	14.659413	1	6	4.26901529	2.54814253
39	2016	0.01709308	0.3957568	1	14.870906	1	6	4.19457889	1.39800774
39	2015	0.00574447	0.3824155	1	14.838327	1	6	4.1191279	0.98278459
39	2014	0.00808225	0.38390638	1	14.841756	1	6	4.49641143	0.78100557
39	2013	0	0.33002579	1	14.426013	1	6	4.46927676	0.5999798
39	2012	0	0.49423455	1	14.024155	1	6	3.04908117	0.30346782
40	2016	1.31717443	1.09584246	1	13.698802	0	6	4.21579141	3.39426444
40	2015	0.4727966	0.88233139	1	13.802254	0	6	4.27400177	3.31834147
40	2014	0.20242806	0.93272101	1	13.893462	0	6	4.07282723	3.0325247
40	2013	0.1551636	1.79911684	1	14.223026	0	6	4.3849515	3.11511842
40	2012	0.23035826	0.83585435	1	14.117645	0	6	4.49412039	2.90852379
41	2016	0.35322681	0.25288486	1	14.500268	1	6	4.09739318	1.96017971
41	2015	0.22095796	0.4757906	1	14.455339	1	6	4.00437015	2.01850599
41	2014	0.38854002	0.4826107	1	14.559526	1	6	3.9813378	1.94987072
41	2013	0.15590314	0.61673525	1	14.710851	1	6	4.15374673	2.09230976

41	2012	0.20372095	0.58861577	1	14.671921	1	6	4.25451878	1.87986558
42	2016	0.09011398	1.03791173	1	11.782923	1	6	3.97647065	2.5635312
42	2015	0.00793642	0.75818839	1	11.888024	1	6	4.06257364	2.38778433
42	2014	0.06482004	0.43631046	1	11.81255	1	6	3.75289526	1.7539342
42	2013	0.00442519	0.61240448	1	12.00915	1	6	4.0016853	1.70253528
42	2012	0	0.67201598	1	11.732442	1	6	4.12065578	1.92516546
43	2016	0.29186556	1.61458246	1	15.097659	1	6	4.29335494	3.10476976
43	2015	0.20151043	0.99959384	1	14.893494	1	6	4.05688156	2.74433931
43	2014	0.10944526	0.70619124	1	15.028424	1	6	4.18184731	2.65462101
43	2013	0.76345698	0.77807134	1	15.041724	1	6	4.33510665	2.68825639
43	2012	0.0322997	1.10303981	1	15.006911	1	6	4.4298778	2.74317781
44	2016	0.11514133	0.32493234	1	12.790275	0	6	3.77938828	1.87369669
44	2015	0.02671982	0.35561218	1	12.813178	0	6	3.7407827	1.78097418
44	2014	0.00346798	0.40951423	1	12.912115	0	6	3.78216937	1.72790924
44	2013	0	0.53791458	1	13.011246	0	6	4.00201874	1.86796652
44	2012	0.03612361	0.65363683	1	12.955233	0	6	4.65925978	2.25894684
45	2016	0.10747767	0.40287041	1	12.646743	0	6	4.00530996	2.95608303
45	2015	0.17372051	0.67421306	1	12.729316	0	6	3.83167956	2.91538557
45	2014	0.09359143	0.70155127	1	12.919156	0	6	3.94128229	2.85976638
45	2013	0.03236167	1.42433433	1	12.983674	0	6	4.22542905	2.8620603
45	2012	0.0379603	0.83498132	1	12.891788	0	6	4.3498473	2.6607606
46	2016	0.00162368	0.29037968	1	11.209448	1	6	3.63048596	1.33277886
46	2015	0.00824393	0.40290116	1	11.319491	1	6	3.66014209	1.22265539
46	2014	0.01254696	0.23613164	1	11.252385	1	6	3.64331448	1.27558652
46	2013	0.00125821	0.14398432	1	11.203188	1	6	3.98938138	1.51799323
46	2012	0.03257367	0.2643377	1	10.910701	1	6	3.97103511	1.78088371

47	2016	0.66971324	0.5547204	1	13.328467	1	6	4.05297949	2.98353524
47	2015	0.53841783	1.07044667	1	13.404692	1	6	4.02614632	3.04010206
47	2014	0.01196414	0.97725487	1	13.475938	1	6	4.11065774	2.92593333
47	2013	0	1.016922	1	13.516383	1	6	4.26976767	3.08304373
47	2012	0.01461567	1.05995219	1	13.469871	1	6	4.37102745	3.11282182
48	2016	0.04247407	0.5348669	1	14.227085	1	6	4.149679	2.16223255
48	2015	0.4185498	0.46179188	1	14.195477	1	6	4.1033693	2.05504856
48	2014	0.10163559	0.62303958	1	14.277709	1	6	4.13114816	1.99197374
48	2013	0.10777221	0.68340791	1	14.342314	1	6	4.28510517	1.84736982
48	2012	0.12267417	0.60842282	1	14.273234	1	6	4.38008312	1.71696893
49	2016	0.5953855	0.74881412	1	13.181723	1	6	3.93694545	2.68090077
49	2015	0.19415625	0.82087131	1	13.179941	1	6	3.96077721	2.61067307
49	2014	0.23228167	0.99510524	1	13.217715	1	6	3.94113619	2.5146317
49	2013	0.03370263	0.83316648	1	13.30918	1	6	4.17286528	2.46622328
49	2012	0.14818722	0.66054392	1	13.202232	1	6	4.28704378	2.27064469
50	2016	0.10136725	0.08598685	1	11.502137	1	6	3.55980278	2.00977456
50	2015	0.01473491	0.39677815	1	11.663407	1	6	3.66932483	2.14804822
50	2014	0.01093697	0.98082525	1	11.526603	1	6	3.72942031	1.94386277
50	2013	0	0.85439788	1	11.553496	1	6	4.02080869	2.03547816
50	2012	0	0.63372196	1	11.373526	1	6	4.14711597	2.06374715
51	2016	0.17459344	0.43941619	1	13.988496	0	6	4.16230085	3.10735862
51	2015	1.07456274	1.23577085	1	13.912609	0	6	3.90878555	3.0056933
51	2014	1.14194537	0.93131727	1	14.187048	0	6	3.8313432	2.98084983
51	2013	0.5748472	0.95346743	1	14.398017	0	6	4.06111601	3.10986059
51	2012	0.76782089	1.54356773	1	14.37842	0	6	4.20652007	3.04699224
52	2016	0.02276783	0.00703222	1	12.716807	0	6	3.49441055	1.30612092

52	2015	0.00966514	0.38601042	1	12.827025	0	6	3.42068189	1.37589573
52	2014	0.03109742	1.07193458	1	12.816761	0	6	3.48095232	2.09060005
52	2013	0.07103425	0.62265551	1	12.809647	0	6	3.77289281	2.33159122
52	2012	0.019834	0.59802078	1	12.647482	0	6	3.83152565	2.48749064
53	2016	0.0547391	0.07010146	1	12.745999	1	7	2.96741741	1.6818914
53	2015	0.11975265	0.68373856	1	12.818119	1	7	2.91334902	1.66844975
53	2014	0.07240996	0.86985509	1	12.863212	1	7	3.07945108	1.69333576
53	2013	0.09748599	0.74221493	1	12.826262	1	7	3.4207014	1.88129772
53	2012	0.33263058	0.79953802	1	12.682881	1	7	3.5501	1.80251822
54	2016	0.04798603	0.33835974	1	12.899535	0	6	3.84927535	2.52650426
54	2015	0.017499	0.68876057	1	12.922964	0	6	3.89567063	2.54120514
54	2014	0.00807233	0.66160388	1	12.980315	0	6	3.83846677	2.36202379
54	2013	0.04079447	0.68593624	1	13.197431	0	6	4.04995503	2.30022902
54	2012	0.01878054	0.57704586	1	13.173134	0	6	4.23797888	2.15961143
55	2016	0.43274883	0.24604647	1	11.678862	1	6	3.86802361	1.13291613
55	2015	0.13818505	0.36018946	1	11.659135	1	6	3.73170206	0.99872823
55	2014	0.33074444	0.31064001	1	11.759147	1	6	3.7142007	0.99601794
55	2013	0.20345745	0.51265655	1	11.790047	1	6	3.86204861	1.51701315
55	2012	0.19022441	0.27015232	1	11.693732	1	6	3.93885976	1.56788878
56	2016	0.15080681	0.51255353	1	13.48782	0	6	3.91880569	2.54717243
56	2015	0.12126762	0.9210884	1	13.533992	0	6	3.84162938	2.52116553
56	2014	0.0042629	0.82978032	1	13.654063	0	6	3.90819605	2.4574725
56	2013	0.00770028	0.79680199	1	13.724628	0	6	4.10701701	2.4672328
56	2012	0.08689212	0.78087459	1	13.656927	0	6	4.21716564	2.46533402
57	2016	0.20127006	0.37092611	1	11.469478	0	6	4.02048237	2.40928894
57	2015	0.26800525	0.70669943	1	11.499807	0	6	3.91991151	2.30392539

57	2014	0.02699241	0.50362758	1	11.638557	0	6	3.95953836	2.05963059
57	2013	0.15624278	0.72356047	1	11.718207	0	6	4.1962187	2.23781177
57	2012	0.2523015	0.47840945	1	11.59658	0	6	4.24465158	2.2805319
58	2016	0.1947663	0.327128	1	12.371272	1	6	3.85590954	1.9772222
58	2015	0.00036593	0.53384836	1	12.243981	1	6	3.81822575	2.0495099
58	2014	0.00478055	0.88858279	1	12.194668	1	6	3.95818832	2.18498239
58	2013	0	0.75214271	1	12.052653	1	6	4.2284422	2.49172841
58	2012	0.17868746	0.44229772	1	11.826545	1	6	4.21847943	2.43253374
59	2016	0.1477396	0.42621696	1	12.096704	0	6	3.76380968	1.92585889
59	2015	0.07962416	0.53612371	1	12.190328	0	6	3.80673291	2.10753653
59	2014	0.07111715	0.72845351	1	12.0522	0	6	3.88007215	2.089048
59	2013	0.00790765	0.70930937	1	11.967443	0	6	3.92322352	2.32590809
59	2012	0.03854549	0.49472917	1	11.881064	0	6	4.28646868	2.16103639
60	2016	0.03992431	0.83709383	1	11.354939	0	6	3.70387006	2.38150699
60	2015	0.04494086	0.37134077	1	11.464203	0	6	3.55946071	2.31273194
60	2014	0.00034994	0.54659076	1	11.659923	0	6	3.65268735	2.5613258
60	2013	0.02537823	0.7664929	1	11.653117	0	6	3.91087511	2.63382114
60	2012	0.00398405	0.68638336	1	11.535675	0	6	3.95570805	2.37885914
61	2016	0.44597473	0.41174336	1	14.156145	0	6	4.04887121	2.71964888
61	2015	0.0104126	0.57495975	1	14.254302	0	6	4.35206051	3.08587494
61	2014	0.04092215	0.64729432	1	14.016317	0	6	4.02775051	2.07268867
61	2013	0.11767725	0.72312143	1	14.08917	0	6	4.2809226	2.20311166
61	2012	0.04286694	0.56449131	1	13.994899	0	6	4.39238522	2.05911778
62	2016	0.13591106	0.43705809	1	14.567156	0	6	4.22554788	2.53757389
62	2015	0.06962121	0.57980714	1	14.588674	0	6	4.11815282	2.41991131
62	2014	0.03838382	1.07486589	1	14.74117	0	6	4.16948484	2.20241453

62	2013	0.16806373	0.73088988	1	14.832263	0	6	4.38499016	2.24554871
62	2012	0.08387229	0.62759748	1	14.77369	0	6	4.45938775	2.06759477
63	2016	0.26955298	0.49913941	1	13.248342	0	6	4.21777672	2.33304339
63	2015	0.0224941	0.62362024	1	13.27632	0	6	4.0754656	2.24627619
63	2014	0.09949324	0.99916868	1	13.421556	0	6	4.25597751	2.31968643
63	2013	0	0.24443527	1	13.308785	0	6	4.31790267	1.60363269
63	2012	0.05969242	0.48744686	1	13.386251	0	6	4.42633361	1.84591632
64	2016	0.02596692	0.79894715	1	12.186026	0	6	3.91499909	2.5210948
64	2015	0.01292511	0.65575108	1	12.111748	0	6	3.95016373	2.47498989
64	2014	0.12097084	0.80132467	1	12.129272	0	6	3.9981178	2.42583555
64	2013	0.01761592	0.4284307	1	12.171539	0	6	4.24047918	2.49844016
64	2012	0.02551764	0.36927473	1	12.025724	0	6	4.27029274	2.34600094
65	2016	0.02040931	0.28319803	1	11.664198	0	6	3.80861596	2.43191472
65	2015	0.04665646	0.35388125	1	11.612599	0	6	3.68802126	2.32282566
65	2014	0.02231222	0.57729122	1	11.766855	0	6	3.73690545	2.27737374
65	2013	0.05982619	0.2079495	1	11.879741	0	6	4.01452295	2.54643353
65	2012	0.035204	0.4176229	1	11.741277	0	6	4.03538333	2.58081718
66	2016	0.08289433	0.44966698	1	12.772703	0	6	3.85136038	1.90118367
66	2015	0.41085986	0.30571696	1	12.780717	0	6	3.78004038	1.97167424
66	2014	0.02953162	0.52097237	1	12.793305	0	6	3.82026022	1.84704973
66	2013	0	0.4255494	1	12.81987	0	6	4.02549095	1.99779579
66	2012	0.01394235	0.36852308	1	12.698993	0	6	4.04343895	1.63063682
67	2016	0.15200667	0.6330675	1	12.804371	0	6	3.98316504	2.19267759
67	2015	0.07195036	0.57613741	1	12.79482	0	6	3.93326714	2.07052831
67	2014	0.01212025	0.68035268	1	12.856824	0	6	3.94617804	1.88466145
67	2013	0.2187467	0.47327577	1	12.935703	0	6	4.2211542	2.12983994

67	2012	0.00353574	0.41893071	1	12.773018	0	6	4.24251879	2.13979966
68	2016	0	0.04855871	1	12.046851	1	6	3.54193253	1.26096325
68	2015	0.36289297	0.12168563	1	12.085016	1	6	3.4432798	1.40911009
68	2014	0.04070903	0.23277304	1	12.125605	1	6	3.49471359	1.45133955
68	2013	0.73711191	0.43386531	1	12.130822	1	6	3.70927149	1.92109654
68	2012	0.12848996	0.63847027	1	12.11553	1	6	3.99509931	2.00349392
69	2016	0	0.10395633	1	11.693818	1	6	4.12228664	1.47825393
69	2015	0.00047889	0.65812914	1	11.682031	1	6	4.07096636	1.66679187
69	2014	0.70910468	0.25943614	1	11.718138	1	6	4.08471548	1.94646842
69	2013	0	0.2879113	1	11.776557	1	6	4.20882144	1.88734991
69	2012	0.00069076	0.34839728	1	11.691061	1	6	4.3419856	1.90531625
70	2016	0.06052203	0.69140967	1	12.323415	0	6	4.02996571	2.24065745
70	2015	0.00135708	0.62907682	1	12.305934	0	6	3.97396841	2.06845895
70	2014	0.00938086	0.58528298	1	12.375653	0	6	4.12906764	2.04608407
70	2013	0.00192515	0.4566847	1	12.318844	0	6	4.31494083	2.09114356
70	2012	0.00736878	0.54217137	1	12.194125	0	6	4.31874885	2.01288432
71	2016	0.61253835	0.60062775	1	12.691941	0	6	4.06825954	2.06137965
71	2015	0.1963732	0.76114736	1	12.728272	0	6	3.95343601	1.9790043
71	2014	0.48956052	0.65926718	1	12.895735	0	6	3.96989153	1.74540868
71	2013	0	0.48404829	1	13.013573	0	6	4.1407846	1.81618066
71	2012	0.4237941	0.56581141	1	12.961163	0	6	4.31801972	1.80999453
72	2016	0.27388761	0.28884664	1	14.841063	0	6	4.01866041	2.13845251
72	2015	0.44287521	0.51428005	1	14.911189	0	6	3.95111336	2.15551955
72	2014	0.29825325	0.76060347	1	15.00025	0	6	3.91550649	2.03916497
72	2013	0.53755246	0.84891983	1	15.044607	0	6	4.15206846	2.48229917
72	2012	0.46877412	0.66678524	1	14.963969	0	6	4.22628146	2.08391751

73	2016	0.06463633	0.55315324	1	13.159826	1	6	3.89568781	2.61201173
73	2015	0.09491101	0.50298678	1	13.303459	1	6	3.79441344	2.63496059
73	2014	0.22090184	0.64902443	1	13.44275	1	6	3.85215304	2.65956083
73	2013	0	0.81742375	1	13.50481	1	6	4.40147126	3.11375221
73	2012	0.12990131	0.28809049	1	13.110743	1	6	4.19956359	2.56447209
74	2016	0.11106631	0.54144833	1	12.081778	1	6	3.9346776	1.88301538
74	2015	0.10194449	0.17528939	1	12.140697	1	6	4.04841849	2.02830231
74	2014	0.02692427	0.21748356	1	12.025282	1	6	4.04930161	2.2039636
74	2013	0	0.64372582	1	12.053135	1	6	4.22601249	2.42170679
74	2012	0.18205402	0.37584541	1	11.862887	1	6	4.20765029	2.10431365
75	2016	0.02587046	0.92966687	1	13.973786	0	6	4.09082675	2.71282896
75	2015	0.06943744	1.12534088	1	14.000126	0	6	4.01616543	2.55683491
75	2014	0.02097743	0.9798051	1	14.084365	0	6	4.05234912	2.40766782
75	2013	0.4904231	0.84296922	1	14.131151	0	6	4.29397319	2.58820589
75	2012	0.66694231	0.75482207	1	14.004057	0	6	4.34428106	2.52488893
76	2016	0.13910782	0.84670569	1	12.268782	0	6	3.67541291	2.60004048
76	2015	0.18839392	0.73671516	1	12.176071	0	6	3.75074145	2.62674209
76	2014	0.13545267	0.74250385	1	12.157517	0	6	3.78723805	2.67073178
76	2013	0.01463439	1.01795125	1	12.210682	0	6	4.08919826	2.75655417
76	2012	0.01511322	0.35310669	1	12.125769	0	6	4.30955158	2.60019747
77	2016	0.1100922	0.09351129	1	12.8322	0	6	3.57676107	2.4305572
77	2015	0.14115488	0.4333364	1	12.820367	0	6	3.32416676	2.41603993
77	2014	0.07325883	0.86022142	1	13.053685	0	6	3.48513897	2.52056863
77	2013	0.19660079	0.70787617	1	12.985265	0	6	3.62745065	2.63671881
77	2012	0.19025996	0.79878296	1	13.017232	0	6	3.8669721	2.81264544
78	2016	0.35312284	0.50439721	1	14.847597	1	6	4.00876603	2.50000312

78	2015	0.22716346	0.75495886	1	14.864791	1	6	3.89866851	2.35754637
78	2014	0.113034	0.8369635	1	14.967381	1	6	3.92005304	2.20116082
78	2013	0.09231935	0.78356953	1	15.017635	1	6	4.12826533	2.10351225
78	2012	0.0894174	0.53199673	1	14.936676	1	6	4.24244143	1.90493621
79	2016	0.15072252	0.38025738	1	13.004832	1	6	4.02490643	2.56477896
79	2015	0.10818333	0.72101523	1	12.996231	1	6	3.79148564	2.37676087
79	2014	0.04329509	0.6553046	1	13.206809	1	6	3.88057731	2.43309901
79	2013	0.02700311	0.35254523	1	13.190403	1	6	4.03477826	1.73657141
79	2012	0.14082138	0.76039827	1	13.281334	1	6	4.12041582	2.25276093
80	2016	0.04790882	0.93052652	1	13.790268	1	6	4.0557799	2.48220183
80	2015	0.11899297	0.4055871	1	13.715433	1	6	3.92425795	2.30704872
80	2014	0.06276633	0.87964583	1	13.720485	1	6	4.27586431	2.4242632
80	2013	0.06903994	0.21522024	1	13.43683	1	6	4.18670762	1.8061289
80	2012	0.00298953	0.69040693	1	13.496743	1	6	4.28161308	1.83385058
81	2016	0.11475089	0.38337831	1	13.801729	0	6	4.24841741	2.85813939
81	2015	0.04180967	0.95268399	1	13.808537	0	6	4.069901	2.65757489
81	2014	0.05825947	0.81851163	1	14.049224	0	6	4.08617367	2.47615404
81	2013	0.03142211	0.71098366	1	14.168264	0	6	4.28687551	2.56205078
81	2012	0.00803662	0.5354876	1	14.104831	0	6	4.41146133	2.41552486
82	2016	0.15449976	0.85695635	1	13.115812	1	6	4.30800229	2.412017
82	2015	0.25999222	0.39502951	1	12.789854	1	6	3.8535007	1.8002095
82	2014	0.00388245	0.59190761	1	12.882037	1	6	3.86815619	1.76796307
82	2013	0.27914347	0.57042403	1	12.897596	1	6	4.07759219	1.90025985
82	2012	0.07356082	0.41946531	1	12.792896	1	6	4.1422236	1.71310562
83	2016	0.85078919	0	1	11.977493	0	6	3.59743924	2.29278836
83	2015	0.54656065	0.38962633	1	12.091852	0	6	3.42918654	2.28516759

83	2014	0.73007922	0.34117189	1	12.218009	0	6	3.40753068	2.4187323
83	2013	0.17917411	0.38962972	1	12.276972	0	6	4.12617817	3.1882983
83	2012	0	0.48337076	1	11.641493	0	6	3.61541519	1.97157093
84	2016	0.05933815	0.274305	1	11.740471	1	6	3.82578582	1.6130171
84	2015	0.02677824	0.20731169	1	11.742897	1	6	3.81317276	1.58733565
84	2014	0.10006793	0.45824413	1	11.768492	1	6	3.79819833	1.66446875
84	2013	0.00545609	0.5471886	1	11.905395	1	6	4.0864126	1.87049224
84	2012	0.05267499	0.35838119	1	11.747343	1	6	4.16679847	1.70432819
85	2016	0.01642635	0.25395982	1	12.79959	1	6	3.81068415	1.43617988
85	2015	0.05377392	0.37247004	1	12.774027	1	6	3.74540051	1.51732854
85	2014	0.00923324	0.26692003	1	12.776382	1	6	3.80644753	1.6536188
85	2013	0	0.2621604	1	12.772275	1	6	4.021987	1.67078811
85	2012	0.12537459	0.41953105	1	12.632733	1	6	4.26174369	1.59162948
86	2016	0.02393818	0.08271851	1	13.302992	0	6	3.24129792	1.33728215
86	2015	0.04547611	0.17272819	1	13.35065	0	6	3.19559561	1.3878509
86	2014	0.09113968	0.27382222	1	13.393883	0	6	3.36775145	1.39428361
86	2013	0.01387529	0.51828831	1	13.369093	0	6	3.58646296	1.55300745
86	2012	0.02324669	0.25601415	1	13.289874	0	6	3.74114593	1.3781271
87	2016	0.00769928	0.57051899	1	11.952222	0	6	3.76851269	2.27821422
87	2015	0.24705693	0.49043167	1	12.054552	0	6	3.56954619	2.23105472
87	2014	0.0091619	0.89708345	1	12.126659	0	6	3.49033263	2.28664909
87	2013	0.10649108	0.5452172	1	12.216376	0	6	3.68969432	2.18059857
87	2012	0.0973481	0.44330859	1	12.111648	0	6	3.82560551	2.34728089
88	2016	0.43894179	0.29617243	1	11.58332	1	6	3.52768148	2.10268603
88	2015	0.30894687	0.47180575	1	11.624959	1	6	3.54392301	2.35386045
88	2014	0.02722696	0.86969208	1	11.533991	1	6	3.66247118	2.47695201

88	2013	0.00831335	0.8412818	1	11.500804	1	6	4.01124842	2.24251232
88	2012	0	0.56855004	1	11.33195	1	6	4.11077948	2.33341697
89	2016	0	0.14174953	1	11.387973	0	6	3.91715281	2.05733089
89	2015	0.04360149	0.03662504	1	11.406381	0	6	3.86203742	2.17759518
89	2014	0.06617999	0.07957614	1	11.450458	0	6	3.81916373	2.27652793
89	2013	1.3E-05	1.17031508	1	11.562659	0	6	4.06112226	2.54345083
89	2012	0.01027107	0.23293783	1	11.465875	0	6	4.13672505	2.14816843
90	2016	0.21684133	0.41923914	1	11.518322	1	6	3.76692248	2.30966279
90	2015	0.29289422	0.69168762	1	11.518056	1	6	3.70096888	2.50518171
90	2014	0.14269243	0.85220693	1	11.675148	1	6	3.69838776	2.2442269
90	2013	0.00453371	0.15127369	1	11.836962	1	6	3.99099761	2.49775081
90	2012	0.04940902	1.02062372	1	11.740339	1	6	4.09616652	2.52615008
91	2016	0.00261657	0.02547962	1	11.424611	0	6	3.48143389	0.6979138
91	2015	0	0.05842456	1	11.448488	0	6	3.43578327	0.79930108
91	2014	0	0.26216424	1	11.495432	0	6	3.53304452	0.66368078
91	2013	0	0.37275457	1	11.559755	0	6	3.75297888	0.83662569
91	2012	0	0.36016156	1	11.50115	0	6	3.83823368	0.74171303
92	2016	0.05796886	0.39543834	1	11.630989	0	6	3.6761457	1.69696845
92	2015	0.14003495	0.2150517	1	11.614677	0	6	3.54594894	1.70489735
92	2014	0.07325139	0.35334832	1	11.579829	0	6	3.53416216	1.56558487
92	2013	0.14710362	0.45080233	1	11.663546	0	6	3.71420416	1.89509464
92	2012	0.05980075	0.98136586	1	11.478715	0	6	3.89218289	1.97401116
93	2016	0.129282	0.21076323	1	12.362039	0	6	3.96502226	2.15842392
93	2015	0.20004768	0.36139897	1	12.398132	0	6	3.81316627	2.15768301
93	2014	0.18570167	0.26100334	1	12.581112	0	6	3.81426216	2.07003961
93	2013	0.1852722	0.67037434	1	12.697823	0	6	4.04710986	2.18424988

93	2012	0.15052641	0.41117279	1	12.631224	0	6	4.09513718	2.17737861
94	2016	0.0025697	0.2680978	1	11.848085	0	6	3.77492643	1.67900259
94	2015	0.01187916	0.27773552	1	11.79292	0	6	3.79597527	1.53046527
94	2014	0.02072181	0.22141085	1	11.827423	0	6	3.84688142	1.55147739
94	2013	0.040347	0.14600934	1	11.900023	0	6	4.03799807	1.66136866
94	2012	0.00053286	0.39923306	1	11.789656	0	6	4.01607629	1.41630525
95	2016	0.83179024	0.5574901	1	12.851345	0	6	3.99721524	2.60579715
95	2015	0.05509879	0.7603417	1	12.885495	0	6	3.93388136	2.58602681
95	2014	0.03736322	0.91310286	1	12.96308	0	6	4.08261546	2.56752519
95	2013	0.0040727	0.94085143	1	12.933583	0	6	4.12899377	2.69248848
95	2012	0.01741645	0.92570429	1	12.893804	0	6	4.26081635	2.66732091
96	2016	0.32413357	0.7251002	1	12.414024	0	6	4.11755054	2.4437669
96	2015	0.39034876	0.6622781	1	12.358597	0	6	4.02092575	2.26839057
96	2014	0.48105113	0.74652063	1	12.501638	0	6	4.00724955	2.21347745
96	2013	0.24747708	0.98406825	1	12.604113	0	6	4.24116277	2.48914648
96	2012	0.69706599	0.92099883	1	12.51952	0	6	4.2474265	2.31646965
97	2016	0.68896846	0.5025047	1	11.917343	1	6	3.661509	2.16677453
97	2015	1.33052343	0.84189601	1	12.038306	1	6	3.53308574	2.35319788
97	2014	0.1148659	1.00254622	1	12.214602	1	6	3.59328168	2.26000802
97	2013	0.13274696	0.52632902	1	12.300654	1	6	3.84672671	2.16399671
97	2012	0.03467965	0.76351384	1	12.228209	1	6	4.02355586	2.1540323
98	2016	0.89193943	0.57407644	1	13.37678	1	6	3.69862041	2.44644766
98	2015	0.16726545	0.65637116	1	13.339383	1	6	3.5885682	2.38910943
98	2014	1.31803158	0.80390873	1	13.435913	1	6	4.01425676	2.94211417
98	2013	0.23164333	0.53161365	1	13.199798	1	6	4.24111856	3.09055511
98	2012	0.04775344	0.63465912	1	12.856774	1	6	4.32578953	2.55562215

99	2016	0.23449567	0.36949314	1	13.219363	0	6	3.93512725	2.52763658
99	2015	0.22176821	0.72604264	1	13.22031	0	6	3.7808367	2.53902979
99	2014	0.06836868	0.83073982	1	13.450092	0	6	3.81983804	2.56332666
99	2013	0.03782358	0.84563691	1	13.52427	0	6	4.04484093	2.69256384
99	2012	0.0095552	0.99852083	1	13.414687	0	6	4.24691877	2.70104902
100	2016	0.00824789	0.39366037	1	13.1915	1	6	4.11992771	2.19015744
100	2015	0.02318416	0.63852678	1	13.278064	1	6	3.8970121	2.04771465
100	2014	0.04599006	0.7072404	1	13.50081	1	6	3.93283246	2.12067525
100	2013	0.15979302	0.72864897	1	13.496697	1	6	4.19166595	2.2747331
100	2012	0.22999284	0.60834445	1	13.364255	1	6	4.36120254	2.16108109
101	2016	0.0127632	0.44341001	1	13.053762	0	6	4.13802734	2.5194827
101	2015	0.02285483	0.6065539	1	13.09055	0	6	4.07735504	2.56319759
101	2014	0.00490296	0.7674185	1	13.190116	0	6	4.06650902	2.49459424
101	2013	0	0.76843321	1	13.296751	0	6	4.27830009	2.45710568
101	2012	0.00591646	0.56880034	1	13.190305	0	6	4.41423651	2.31708052
102	2016	0.11326172	0.36655725	1	13.506303	1	6	3.63894637	1.83392648
102	2015	0.0281899	0.5749665	1	13.505832	1	6	3.51227568	1.83120852
102	2014	0.83775216	0.79643184	1	13.662194	1	6	3.63450695	1.91365581
102	2013	0.04400253	0.62747041	1	13.709665	1	6	3.95952932	2.08615595
102	2012	0.01735945	0.60831778	1	13.512381	1	6	4.10983002	2.10108108
103	2016	0.15167075	0.20718489	1	10.913648	1	6	4.06711866	0.99936269
103	2015	0.01488566	0.12938393	1	10.756307	1	6	3.8943445	0.29500346
103	2014	0	0.30987962	1	10.782415	1	6	3.81303613	0.29597385
103	2013	0	0.38877324	1	10.499588	1	6	4.1004613	0.140632
103	2012	0	0.32591961	1	9.829317	1	6	4.13208636	0
104	2016	0.38646508	0.53284462	1	13.387499	0	6	3.89568254	2.96832922

104	2015	0.0051726	0.54640491	1	13.474932	0	6	3.84782111	2.91640326
104	2014	0.03569914	0.70150615	1	13.606656	0	6	3.93098002	2.8994153
104	2013	0.07331273	0.90592075	1	13.669512	0	6	4.24386798	3.17444725
104	2012	0.05619033	0.66846712	1	13.529483	0	6	4.27782022	2.90954499
105	2016	0.13499145	0.72823919	1	12.180784	0	6	4.01320513	2.76420014
105	2015	0.25826819	0.76764083	1	12.19242	0	6	3.97372133	2.45095708
105	2014	0.07700919	0.47013487	1	12.285439	0	6	3.98651914	2.36637139
105	2013	0.15862039	0.56997283	1	12.385777	0	6	4.20598425	2.58210285
105	2012	0.04884731	0.40526375	1	12.257589	0	6	4.23112163	2.43405826
106	2016	0.11522243	0.4873019	1	16.275101	0	6	4.01408602	2.17643814
106	2015	0.2859373	0.4768669	1	16.365984	0	6	4.01580462	2.05371262
106	2014	0.03318136	0.39336149	1	16.363546	0	6	3.88559207	1.74548426
106	2013	0.02549522	0.38395747	1	16.445487	0	6	4.10871242	1.88873463
106	2012	0.07930921	0.59760772	1	16.32992	0	6	4.25943972	1.93996293
107	2016	0.06753808	0.58727542	1	12.092406	1	6	3.50257807	1.52330775
107	2015	0.03370457	0.24281205	1	12.03986	1	6	3.496817	1.30722897
107	2014	0.00026596	0.24408514	1	12.104039	1	6	3.60713525	1.55411948
107	2013	0.044916	0.34661703	1	12.115803	1	6	3.74055108	1.51827546
107	2012	0.12095932	0.18356994	1	12.033103	1	6	3.8782143	1.4432492
108	2016	0.13142204	0.85242185	1	10.305164	0	6	3.71735306	2.50500776
108	2015	0.10428073	0.29155706	1	10.339422	0	6	3.63869959	2.34851899
108	2014	0.15980921	1.04327398	1	10.535785	0	6	3.70009984	2.38716776
108	2013	0.97458379	0.37724257	1	10.60096	0	6	3.98649115	2.63585764
108	2012	0.07036153	0.34476277	1	10.54145	0	6	4.08018678	2.6812641
109	2016	0.34760221	0.11987862	1	12.922482	0	6	3.88427854	2.29000996
109	2015	0.04086167	0.82615025	1	13.047521	0	6	3.7263298	2.13196758

109	2014	0.01213013	0.82010048	1	13.180873	0	6	3.66587625	1.85266186
109	2013	0.02507595	0.48276683	1	13.299729	0	6	3.92027838	1.81327142
109	2012	0.02199043	0.65991351	1	13.212612	0	6	4.07327125	2.01479942
110	2016	0.05987516	0.52010424	1	14.168092	0	6	4.26659489	2.39908611
110	2015	0.09854404	0.65344539	1	14.107785	0	6	4.07666793	2.17658062
110	2014	0.15145849	0.62975094	1	14.22226	0	6	4.0762282	2.13340272
110	2013	0.13215219	0.72144305	1	14.32485	0	6	4.29167054	2.28802765
110	2012	0.17187215	0.52624513	1	14.251589	0	6	4.36762342	2.18792559
111	2016	0.30951572	0.44917317	1	13.510217	0	6	4.03077029	2.5802544
111	2015	0.15065974	0.6924019	1	13.449484	0	6	3.8865951	2.45934804
111	2014	0.39207655	0.77186039	1	13.603462	0	6	3.88562225	2.41573591
111	2013	0.12193352	0.80523447	1	13.722397	0	6	4.0946551	2.51839736
111	2012	0.08810428	0.82958534	1	13.691877	0	6	4.30587968	2.45057069
112	2016	0.20815336	0.5746761	1	13.959817	0	6	3.99976156	2.85591315
112	2015	0.14507909	0.6500502	1	13.97656	0	6	4.16712349	3.02537811
112	2014	0.08394401	0.54032928	1	13.828131	0	6	3.95776497	2.53055729
112	2013	0.0469437	0.64139799	1	13.892947	0	6	4.18098975	2.60515287
112	2012	0.0674848	0.65304056	1	13.796953	0	6	4.32486664	2.48156156
113	2016	0.38682309	0.31112952	1	14.538773	1	6	3.85910475	2.20810934
113	2015	0.34369466	0.61599666	1	14.695322	1	6	4.01795792	2.3697021
113	2014	0.40531243	0.50656938	1	14.643462	1	6	3.91071473	2.31910341
113	2013	0.39201438	0.86876465	1	14.806075	1	6	4.08589527	2.4516119
113	2012	0.50642475	1.0752686	1	14.804982	1	6	4.41775341	2.43771336
114	2016	0.35958521	0.36230636	1	13.166222	0	6	4.01866152	2.35219778
114	2015	0.04133962	0.40728412	1	13.06516	0	6	3.93496048	2.25170477
114	2014	0.03686313	0.52846415	1	13.188878	0	6	3.93508191	2.17192591

114	2013	0.06895874	0.72111783	1	13.315938	0	6	4.16902639	2.3536022
114	2012	0.07800032	0.58609412	1	13.247449	0	6	4.30779316	2.39296706
115	2016	0.07871968	0.54514531	1	14.968862	1	6	4.10320038	2.27168816
115	2015	0.083256	0.55149433	1	14.973467	1	6	4.01323304	2.18078417
115	2014	0.10725402	0.61983212	1	15.057852	1	6	4.00708561	2.01842016
115	2013	0.1114063	0.62960816	1	15.162764	1	6	4.22371907	2.39006222
115	2012	0.40642465	0.81717998	1	15.135433	1	6	4.3376504	2.31085292
116	2016	0.13471881	0.72276812	1	12.814667	0	6	4.05971996	2.87801737
116	2015	0.24786738	0.86277898	1	12.82595	0	6	3.9536182	2.89077151
116	2014	0.06961095	0.97694095	1	12.936751	0	6	3.97467775	2.87375366
116	2013	0.06000702	0.95521948	1	12.997438	0	6	4.0852446	2.93419474
116	2012	0.01703213	1.11554479	1	12.943048	0	6	4.37117854	2.87181554
117	2016	0.04412693	0.11422828	1	13.246749	0	6	2.63675532	0.43428513
117	2015	0.13797861	0.45042381	1	14.532887	0	6	4.20311804	2.69826044
117	2014	0.09235582	0.72466813	1	14.571648	0	6	4.1883232	2.65077202
117	2013	0.26117125	0.71479565	1	14.680812	0	6	4.28904684	2.68219228
117	2012	0.29688609	0.62000643	1	14.707395	0	6	4.34971917	2.52153322
118	2016	0.02570088	0.40618085	1	11.479782	1	6	3.80107987	1.86968101
118	2015	0.1855638	0.26793028	1	11.757387	1	6	3.70848199	1.79816624
118	2014	0.01691611	0.13383922	1	11.896681	1	6	3.68302774	1.64059854
118	2013	0	0.07691752	1	12.005314	1	6	3.94028683	1.87391886
118	2012	0.04251432	0.26246657	1	11.847371	1	6	3.91771573	1.54014914
119	2016	0.22898327	0.51741427	1	13.150127	0	6	4.15386476	1.83034488
119	2015	0.24771362	0.63069395	1	13.140458	0	6	3.99446728	1.59974529
119	2014	0.47634287	0.52833857	1	13.325357	0	6	3.94131416	1.39111771
119	2013	0.14361105	0.59117425	1	13.507221	0	6	4.14156682	1.52254275

119	2012	0.3151304	0.68820951	1	13.452883	0	6	4.23954352	1.66314947
120	2016	0.14094559	0.21613263	1	13.354586	1	6	3.73551344	1.45279416
120	2015	0.15831571	0.45750016	1	13.520023	1	6	3.74730873	1.65908238
120	2014	0.03023624	0.70252903	1	13.564016	1	6	3.78648842	1.64978491
120	2013	0.09656485	0.70414993	1	13.602476	1	6	4.05456959	1.74907167
120	2012	0.62087591	0.86303298	1	13.503608	1	6	4.09836932	1.89870757
121	2016	0.00052986	0.01442151	1	13.938326	0	6	3.89783393	0.09881132
121	2015	0	0.07744426	1	13.83134	0	6	4.08824136	0.08512026
121	2014	0.00148989	0.03568756	1	13.683266	0	6	3.99919888	0.35526034
121	2013	0.00826277	0.05609768	1	13.780665	0	6	3.9551828	0.58540439
121	2012	0	0.00731022	1	13.894969	0	6	3.69775096	0.04355649
122	2016	0.01687678	0.01289944	1	14.462399	1	6	3.20127996	0.75580972
122	2015	0.0292539	0.11757946	1	14.222306	1	6	3.04958375	0.75079325
122	2014	0.01858326	0.10250785	1	14.275821	1	6	3.15481685	0.67094554
122	2013	0	0.07586971	1	14.263791	1	6	3.55389692	0.96036962
122	2012	0	0.25333749	1	13.99073	1	6	3.84395301	1.19089638
123	2016	0	0.01146898	1	12.792902	0	6	3.76766829	0.75252161
123	2015	0	0.12110108	1	12.731126	0	6	3.93336883	0.70273556
123	2014	0	0.36173124	1	12.667049	0	6	3.82763263	0.74803964
123	2013	0	0.45576017	1	12.716453	0	6	4.21793702	1.0953075
123	2012	0	0.02540943	1	12.453151	0	6	4.35161408	0
124	2016	0.00349289	0.02995775	1	15.991265	0	6	3.42727242	0.53189921
124	2015	0.03299561	0.01623844	1	15.711406	0	6	3.36967087	0.52470545
124	2014	0.17198498	0.09567375	1	15.824377	0	6	3.21618733	0.59226717
124	2013	0.00054685	0.06785396	1	16.024413	0	6	3.11012058	0.61979016
124	2012	0.00182633	0.07702771	1	16.082924	0	6	3.41227164	0.64165597

125	2016	0	0.00023397	1	13.17536	1	6	3.55859778	0.16070203
125	2015	0	0.02095588	1	13.016674	1	6	3.65195076	0.1869641
125	2014	0	0.00918568	1	13.033627	1	6	3.56025995	0.18278145
125	2013	0	0.02517542	1	12.885898	1	6	3.67796344	0.19073936
125	2012	0	0	1	12.785511	1	6	3.81737702	0.66134067
126	2016	0.95161811	0.56742748	1	16.032545	1	6	4.42479263	3.31978033
126	2015	0.50435614	0.24117049	1	15.840347	1	6	3.64001744	2.18086651
126	2014	0.11145103	0.21755195	1	16.126889	1	6	3.12906962	1.51735793
126	2013	0.02202467	0.45291851	1	16.565084	1	6	3.41943876	1.96684911
126	2012	0.06470007	0.84373767	1	16.187526	1	6	4.10625116	2.78127129
127	2016	0.03171279	0.00537354	1	18.881541	1	6	2.91628536	0.5453824
127	2015	0.02216356	0.00025597	1	18.937712	1	6	2.72182437	0.57534008
127	2014	0.04222485	0.07598464	1	19.00262	1	6	2.72848074	0.66832361
127	2013	0.00962255	0.1526919	1	19.064638	1	6	2.70959388	0.61196099
127	2012	0	0.07424253	1	19.115203	1	6	2.62047445	0.16235777
128	2016	0.27117076	0.43011089	1	14.447602	1	6	3.94917606	2.53807705
128	2015	0.40320723	1.07525666	1	14.413817	1	6	3.782258	2.45684671
128	2014	0.01725035	1.00386562	1	14.57332	1	6	3.88831744	2.47789639
128	2013	0.28595608	1.1047948	1	14.615821	1	6	4.12081973	2.56156541
128	2012	0.5428108	0.74597158	1	14.582951	1	6	4.39306212	2.57577143
129	2016	0.34902879	1.47510528	1	14.299335	0	6	4.02535883	3.46376449
129	2015	0.2438877	1.21053195	1	14.467856	0	6	4.02785721	3.35598768
129	2014	0.40334954	1.07808028	1	14.683147	0	6	4.10759153	3.20036605
129	2013	0	1.6749951	1	14.847372	0	6	4.18246305	3.15022929
129	2012	0.13768849	0.8621344	1	14.968901	0	6	4.23829756	2.85511291
130	2016	0.00987805	0.02358371	1	17.605185	0	6	2.97935835	0.23900666

130	2015	0.02018099	0.02736611	1	17.700696	0	6	2.81901974	0.21914999
130	2014	0.02400359	0.0703345	1	17.760144	0	6	3.38875165	0.33186019
130	2013	0.01750686	0.07584746	1	17.174097	0	6	3.53778961	0.35108002
130	2012	0.01953298	0.0588329	1	16.968011	0	6	3.5862866	0.35286781
131	2016	0.53949704	1.26948607	1	18.899801	0	6	4.12908466	3.30432206
131	2015	0.754056	0.68931987	1	19.030464	0	6	4.03433378	3.19278935
131	2014	0.82426184	1.49476506	1	19.202013	0	6	3.98741671	3.00265342
131	2013	0.34734576	0.83859899	1	19.430779	0	6	4.15358641	2.8508499
131	2012	0.0855766	0.75595953	1	19.481221	0	6	4.11354552	2.55066201
132	2016	0.16693377	0.40361206	1	13.216272	1	6	4.02299941	1.9507507
132	2015	0.04272898	0.34285965	1	13.200745	1	6	3.93060404	1.84686031
132	2014	0.20499913	0.35925781	1	13.173977	1	6	3.98949725	1.74075543
132	2013	0.28232299	0.4293587	1	13.143364	1	6	4.18287332	1.7961012
132	2012	0.16363386	0.62108818	1	12.963299	1	6	4.25526448	1.80161046
133	2016	1.3809775	0.56755221	1	18.238271	1	5	4.35089675	2.85296107
133	2015	0.31032111	0.624591	1	18.250701	1	6	4.22772577	2.7363394
133	2014	0.26781247	0.72226414	1	18.395659	1	6	4.17755623	2.56263067
133	2013	0.15178417	0.6954615	1	18.579688	1	6	4.3049559	2.56126929
133	2012	0.05975271	0.59685762	1	18.605525	1	6	4.28498495	2.54123437
134	2016	0.07714065	0.09412766	1	14.854544	1	6	4.19398368	1.24657443
134	2015	0.04987148	0.18895782	1	14.781042	1	6	4.08380412	1.14380297
134	2014	0.02309524	0.22275548	1	14.848629	1	6	4.16935005	1.02984546
134	2013	0.05431961	0.17086957	1	14.837035	1	6	4.30284502	1.1494898
134	2012	0.02191119	0.2286786	1	14.74274	1	6	4.29702096	1.05340325
135	2016	1.94196136	1.21285008	1	13.879011	0	6	4.16694275	2.88878851
135	2015	0.55426837	0.8879143	1	13.940974	0	6	4.1830939	2.78080574

135	2014	0	0.98369851	1	14.032712	0	6	4.23667426	2.67645399
135	2013	0.56991684	0.84331437	1	14.067987	0	6	4.37174317	2.64119825
135	2012	0.07839982	0.6977665	1	13.976832	0	6	4.40674947	2.53787956
136	2016	0.00454366	0.00566294	1	14.256172	0	6	3.5011311	0.22036369
136	2015	0.01375299	0.04104981	1	13.993717	0	6	3.56613168	0
136	2014	0	0.01058577	1	13.919311	0	6	3.66491737	0.34768627
136	2013	0	0.04136265	1	13.796449	0	6	3.99492496	0.21644275
136	2012	0.00719307	0.04854537	1	13.546535	0	6	3.96551115	0.2902585
137	2016	0.5240348	0.98621522	1	17.105678	1	6	4.15464653	3.01501305
137	2015	0.42632339	0.86262072	1	17.192684	1	6	4.09908585	2.91730614
137	2014	0.22625072	1.13116144	1	17.37036	1	6	4.13539394	2.80028073
137	2013	0.28518947	0.65834453	1	17.440111	1	6	4.27129524	2.68126198
137	2012	0.12885221	0.82079077	1	17.490414	1	6	4.38187212	2.47362289
138	2016	0.0153555	0.16921268	1	14.590311	0	6	3.32691663	1.48596728
138	2015	0.01124553	0.30910177	1	14.564983	0	6	3.42065459	1.55987785
138	2014	0	0.57550826	1	14.400884	0	6	3.4939214	1.44932714
138	2013	0.00835202	0.33738896	1	14.416477	0	6	3.83340107	1.61846782
138	2012	0.04574936	0.39169473	1	14.184667	0	6	4.23112333	1.90609836
139	2016	0.4813583	0.80624727	1	13.673775	1	6	4.02015317	2.58918288
139	2015	0.76205785	0.51781236	1	13.611635	1	6	3.9906518	2.5154243
139	2014	0.04912535	0.65240695	1	13.655213	1	6	3.83598908	2.28628385
139	2013	0.04626603	0.85171381	1	13.903741	1	6	4.25553949	2.36450055
139	2012	0	0.74568555	1	13.570523	1	6	4.39814062	2.38530821
140	2016	0.11170862	0.5736714	1	14.689235	1	6	4.16077978	2.64667581
140	2015	0.1686164	0.89292016	1	14.672941	1	6	4.03696277	2.54233605
140	2014	0.22760319	0.87282608	1	14.782126	1	6	4.09561609	2.4154769

140	2013	0.16158639	0.6466204	1	14.811556	1	6	4.31074602	2.47547044
140	2012	0.17656586	0.65924028	1	14.718081	1	6	4.32735904	2.40674455
141	2016	0.85616274	0.68864556	1	16.09994	1	6	4.32724412	2.63368887
141	2015	0.09772726	0.46995675	1	16.065578	1	6	4.49531164	2.73472413
141	2014	0.66249981	0.32942388	1	15.885327	1	6	4.3163671	2.03726824
141	2013	0.20946726	0.29240913	1	15.945724	1	6	4.47176525	2.17941074
141	2012	0.36820274	0.39322585	1	15.875644	1	6	4.52198364	2.18084449
142	2016	0.3829052	0.64453188	1	11.959497	1	6	4.33819572	2.04561068
142	2015	0.18824481	0.78447809	1	11.881245	1	6	4.27695243	2.18043554
142	2014	0.30190371	0.88838003	1	11.870781	1	6	4.18552404	2.02711679
142	2013	0.31201926	0.65272719	1	11.805216	1	6	4.4839449	2.14265352
142	2012	0.00995825	0.56919038	1	11.476843	1	6	4.40841448	2.14424659
143	2016	0.46675962	0.42875055	1	16.476237	1	6	4.20772313	2.97102648
143	2015	0.01383584	0.93947469	1	16.595762	1	6	4.17629761	3.00950179
143	2014	0.09728822	0.61792836	1	16.660433	1	6	4.48443354	3.16098274
143	2013	1.23502864	0.59471814	1	16.470886	1	6	4.33668071	2.6574885
143	2012	0.04739204	0.8568358	1	16.348048	1	6	4.46223363	2.6239996
144	2016	0.4817537	0.655613	1	12.971964	1	6	4.12071086	2.39684745
144	2015	0.10117025	0.82596025	1	12.9639	1	6	4.05518693	2.36978251
144	2014	0.38993785	0.7740901	1	13.017114	1	6	4.14515115	2.31028021
144	2013	0.28336301	0.65918028	1	13.02587	1	6	4.34199141	2.36937935
144	2012	0.07045287	0.69207961	1	12.886312	1	6	4.42328099	2.41137394
145	2016	0.01104973	0.46830719	1	13.693425	1	6	4.33511833	2.86382493
145	2015	0.08886765	0.83419873	1	13.583348	1	6	4.20822786	2.76712708
145	2014	0.00902713	0.46575085	1	13.669865	1	6	4.24123583	2.4022219
145	2013	0.11640965	0.2009143	1	13.751707	1	6	4.38288084	2.46426677

145	2012	0.20004768	0.16531781	1	13.723719	1	6	4.37948907	2.48235222
146	2016	0.13975846	0.50702059	1	13.70603	0	6	4.14141536	2.15961709
146	2015	0.07460828	0.46759197	1	13.808865	0	6	4.08641321	2.06931406
146	2014	0.01901702	0.53096643	1	13.868857	0	6	4.17313549	2.00957338
146	2013	0.00011199	0.39916396	1	13.896484	0	6	4.3910333	2.13024943
146	2012	0.00943535	0.28948694	1	13.789817	0	6	4.47188191	1.82766347
147	2016	4.76946331	0.46568557	1	13.331951	0	6	4.5484646	2.68187801
147	2015	0.03106059	0.61115917	1	13.307054	0	6	4.43643696	2.56256482
147	2014	0.02916649	0.50084438	1	13.397669	0	6	4.42828746	2.26603303
147	2013	0.03708478	0.87048467	1	13.455017	0	6	4.65867542	2.34451473
147	2012	0.02287828	0.69453072	1	13.327438	0	6	4.56067229	1.95489707
148	2016	0.26459485	0.37335574	1	15.285536	1	6	4.13349356	2.98083486
148	2015	0.25339027	0.95643563	1	15.312305	1	6	4.0701075	2.80835618
148	2014	0.20190112	0.62041626	1	15.47098	1	6	4.07653694	2.70826065
148	2013	0.39504838	0.68590452	1	15.634485	1	6	4.25956325	2.79446059
148	2012	0.10510568	1.45494341	1	15.633721	1	6	4.37243474	2.58335229
149	2016	0.42560232	0.51965711	1	17.484407	1	6	4.24801235	2.56948919
149	2015	0.35028004	0.68400149	1	17.471087	1	6	4.1176033	2.46045402
149	2014	0.21110822	0.80948562	1	17.582389	1	6	4.18216511	2.35101843
149	2013	0.24198807	0.91581822	1	17.626453	1	6	4.35977012	2.3616681
149	2012	0.07600596	0.98811415	1	17.569275	1	6	4.49011703	2.04620671
150	2016	0.58370334	0.38498005	1	15.229794	1	6	4.11423018	2.57904607
150	2015	0.37085089	0.75230107	1	15.221566	1	6	4.18851992	2.59486627
150	2014	0.31508953	0.63931065	1	15.231187	1	6	4.03690775	2.22937194
150	2013	0.28551422	0.57106259	1	15.411135	1	6	4.21003047	2.36441802
150	2012	0.28966286	0.34699807	1	15.365327	1	6	4.25892431	2.20938358

151	2016	0.63610476	1.02274045	1	13.90899	1	6	4.11218749	3.03374663
151	2015	0.39241432	0.62961935	1	13.978704	1	6	4.01092165	2.92003314
151	2014	0.08442111	0.50949774	1	14.115351	1	6	4.03122844	2.83192051
151	2013	0.35811141	0.8174476	1	14.182601	1	6	4.17440161	3.01875369
151	2012	0.309435	0.48644461	1	14.141193	1	6	4.29481812	2.88810057
152	2016	0.06316915	1.49093429	1	14.072457	0	6	4.1462026	3.23954051
152	2015	0.1214554	1.10060197	1	14.172667	0	6	4.13464274	2.96929107
152	2014	0.13489883	1.05562232	1	14.328186	0	6	4.23163718	2.93566035
152	2013	0.16081783	1.29091223	1	14.384694	0	6	4.55382942	3.16662118
152	2012	1.00940833	0.71946092	1	14.218567	0	6	4.59702334	2.99004347
153	2016	0.21944472	0.28549017	1	13.126234	1	6	4.2266827	2.33349967
153	2015	0.05952001	0.37255892	1	13.132973	1	6	4.35926986	2.41543411
153	2014	0.00746904	0.54075387	1	13.049177	1	6	4.33085961	2.69253499
153	2013	0.06985064	0.34260908	1	13.18118	1	6	4.44285824	2.61818034
153	2012	0.07757011	0.35762759	1	13.252283	1	6	4.43368767	2.29494246
154	2016	0	0.00199102	1	14.443919	1	6	2.8861652	0.31246712
154	2015	0.03282144	0.02989855	1	14.613421	1	6	2.88898363	0.32217045
154	2014	0	0.05108277	1	14.662091	1	6	3.03981131	0.32566909
154	2013	0.00041591	0.0099028	1	14.780455	1	6	3.00489918	0.59468614
154	2012	0.10300504	0.20286982	1	14.689847	1	6	2.44804572	0.55957522
155	2016	0.02100582	0.55115495	1	11.124235	1	6	3.73724146	2.21745859
155	2015	0.00844821	0.57302604	1	11.219223	1	6	3.82316899	1.88476138
155	2014	0.21733391	0.22654337	1	11.309849	1	6	3.90115393	1.6948006
155	2013	0.06837988	0.44363334	1	11.436443	1	6	4.1412531	1.85520004
155	2012	0.01338798	0.77343463	1	11.179236	1	6	4.03477894	1.62870412
156	2016	0.05284764	0.18685709	1	13.64875	0	6	3.67476149	0.57037654

156	2015	0.26733956	0.23518911	1	13.534384	0	6	3.63196717	0.68392832
156	2014	0.02161862	0.29470337	1	13.497119	0	6	3.46198372	0.62181389
156	2013	0.10939238	0.38204703	1	13.560734	0	6	3.3480007	0.6705375
156	2012	0.01589303	0.1303447	1	13.582299	0	6	3.33897738	0.32628192
157	2016	2.15338333	0.45643258	1	12.836968	1	6	4.05031653	3.44542461
157	2015	0.41466995	0.36057931	1	12.879021	1	6	3.8650829	3.23574277
157	2014	0.01399067	1.77047199	1	13.126897	1	6	3.93357023	3.17399837
157	2013	0.00218561	1.35017069	1	13.226556	1	6	4.1069405	3.15588806
157	2012	0	1.19518743	1	13.365028	1	6	4.20556446	2.84878946
158	2016	0.20940562	0.51857472	1	14.426141	1	6	3.88009197	2.42274033
158	2015	0.29158171	0.51664565	1	14.588608	1	6	3.76839147	2.38248284
158	2014	0.0629917	0.97482376	1	14.727084	1	6	3.78752085	2.32403793
158	2013	0.1426222	0.96197092	1	14.818212	1	6	4.14961415	2.60582454
158	2012	0.59369363	1.06065078	1	14.559441	1	6	4.57979091	2.88982861
159	2016	0.09256004	0.11313224	1	12.699898	1	6	3.36605869	1.07924597
159	2015	0.11541579	0.15068468	1	12.596538	1	6	3.24073606	0.89092492
159	2014	0.16944146	0.15559763	1	12.659879	1	6	3.41712657	1.02203429
159	2013	0.07503326	0.36653923	1	12.613934	1	6	3.73515131	1.26861748
159	2012	0.05305724	0.52102761	1	12.400683	1	6	4.01083778	1.16116446
160	2016	0.92009588	0.45018605	1	16.455839	0	6	4.02174407	2.22837607
160	2015	0.46789391	0.59393992	1	16.537269	0	6	3.94207163	2.17798354
160	2014	0.88340673	0.78413896	1	16.666818	0	6	3.99118213	2.28644687
160	2013	0.26879279	0.74174923	1	16.729244	0	6	4.20720201	2.2957515
160	2012	0.67774568	0.69531683	1	16.668035	0	6	4.23278692	2.22975996
161	2016	0.88366423	0.40802184	1	16.289383	0	6	4.15613542	2.3263397
161	2015	0.52729683	0.60865626	1	16.276874	0	6	4.06302204	2.31543962

161	2014	0.37948931	0.64355927	1	16.367227	0	6	4.12307399	2.27268274
161	2013	0.19454735	0.74859702	1	16.448313	0	6	4.34214205	2.25847321
161	2012	0.7396304	0.7066654	1	16.387221	0	6	4.37125773	2.19633118
162	2016	0.490627	0.53373694	1	13.196271	0	6	4.077088	1.9630073
162	2015	0.64904272	0.65971655	1	13.232915	0	6	4.00025355	1.9939452
162	2014	0.31714087	0.69186886	1	13.365157	0	6	4.0036105	1.85797377
162	2013	0.40157622	0.73140782	1	13.489174	0	6	4.21074399	2.06679478
162	2012	0.35245314	0.62296879	1	13.410874	0	6	4.26358082	2.2416501
163	2016	0.23917043	0.63753034	1	13.744259	1	6	4.07969051	2.11906722
163	2015	0.26301482	0.57314105	1	13.733753	1	6	4.05196874	2.11985961
163	2014	0.17598989	0.67624565	1	13.841647	1	6	3.99835577	1.82112618
163	2013	0.16629972	0.45905769	1	13.920513	1	6	4.22259005	1.92308184
163	2012	0.13235983	0.47679241	1	13.824961	1	6	4.28911986	1.58866851
164	2016	0.63929377	0.38138346	1	20.463781	1	6	3.97794785	1.37571939
164	2015	0.5433871	0.47174149	1	20.520672	1	6	4.07557713	1.5249039
164	2014	0.53528153	0.50101647	1	20.458312	1	5	3.93417194	1.48857113
164	2013	0.53839916	0.64919477	1	20.5044	1	5	3.9734458	1.64289377
164	2012	0.48665669	0.85609519	1	20.550689	1	5	4.10259485	1.49540411
165	2016	0.22165925	0.04486437	1	17.513247	1	5	4.00954826	0.9724805
165	2015	0.36672913	0.22312275	1	17.606066	1	5	3.9527284	1.07856229
165	2014	0.30447872	0.33526365	1	17.762045	1	5	3.97213941	1.11711505
165	2013	0.1879656	0.49438339	1	17.891135	1	5	4.12552633	1.20566178
165	2012	0.18140113	0.54625377	1	17.889627	1	5	4.18835054	1.15617812
166	2016	0.9789714	0.89368023	1	18.1346	1	5	4.14446735	1.7084813
166	2015	0.71423966	0.68220149	1	18.216447	1	5	4.12760244	1.74026387
166	2014	0.72542268	0.82699165	1	18.344985	1	5	4.07128591	1.70415701

166	2013	0.71306843	0.72998043	1	18.543747	1	5	4.20703997	1.78934606
166	2012	0.16232546	1.07110199	1	18.589649	1	5	4.23850744	1.71445807
167	2016	0.02459212	0.53653898	1	13.793104	0	6	4.14721	2.11568487
167	2015	0.06173365	0.48469579	1	13.659798	0	6	3.98327063	1.98535378
167	2014	0.00878629	0.50401186	1	13.764172	0	6	4.12630538	1.76283551
167	2013	0.00600593	0.46702169	1	13.739754	0	6	4.37469773	1.81125421
167	2012	0.22879316	0.39833441	1	13.574574	0	6	4.49100424	1.78066364
168	2016	0.55597259	0.53797998	1	16.38314	1	6	4.35462675	2.55957208
168	2015	0.71628151	0.704929	1	16.405868	1	6	4.21941047	2.44090103
168	2014	0.09018525	0.88755087	1	16.540323	1	6	4.53046966	2.53964449
168	2013	0.2016543	0.96120062	1	16.363756	1	6	4.41917944	2.20385179
168	2012	0.57202646	0.73914822	1	16.274572	1	6	4.45159955	2.0279398
169	2016	0.38778235	0.35050052	1	12.848622	1	6	4.12680661	2.01638459
169	2015	0.20826948	0.49462612	1	13.017532	1	6	4.33459699	2.16478196
169	2014	0.72651329	0.53575743	1	12.814022	1	6	4.20102123	2.23293465
169	2013	0.99343805	1.21043508	1	12.91366	1	6	4.63262228	2.86090587
169	2012	0.49773127	0.84335481	1	12.560317	1	6	4.67877136	2.9223752
170	2016	0.46337043	0.34595499	1	16.393717	1	6	4.03290059	2.85459978
170	2015	0.38273404	0.50396535	1	16.481162	1	6	4.06707021	2.89597901
170	2014	0.2148307	0.59294556	1	16.528514	1	6	4.03308944	2.80162536
170	2013	0.18363819	0.66132777	1	16.692343	1	6	4.34820606	3.12904162
170	2012	0.47723492	0.97584033	1	16.623939	1	6	4.31445092	2.93033584
171	2016	0.18550565	0.16118389	1	13.456576	0	6	3.808522	2.13110935
171	2015	0.05925898	0.42211899	1	13.472509	0	6	3.66140044	2.07346409
171	2014	0.02198652	0.20736939	1	13.608461	0	6	3.6414592	1.92182133
171	2013	0.03366299	0.42011264	1	13.73342	0	6	3.84293223	2.08769861

171	2012	0.00657633	0.52091001	1	13.674134	0	6	3.98701591	1.98015794
172	2016	0.96118341	0.52496992	1	21.067969	1	6	4.05035516	1.20988827
172	2015	0.65318523	0.54341497	1	21.101114	1	6	4.03552093	1.26940009
172	2014	0.7727284	0.60443563	1	21.153365	1	5	4.07322349	1.43169331
172	2013	0.83368665	0.64419063	1	21.154123	1	5	4.01902515	1.46312299
172	2012	0.64419063	0.92080851	1	21.239167	1	5	4.07679712	1.35568128
173	2016	0.00068077	0.0981108	0	16.03078	0	7	4.050864	0.62950159
173	2015	0.00775882	0.00576933	0	16.136996	0	7	3.97289215	0.42344058
173	2014	0.0024899	0.04670895	0	16.241123	0	7	3.98150246	0.41783495
173	2013	0.00532679	0.05005508	0	16.296769	0	7	4.26320105	0.54667701
173	2012	0.02099799	0.43855102	0	16.082573	0	7	4.30173791	0.64657483
174	2016	0.10018645	0.08837253	1	16.196683	1	6	3.50640284	0.7856238
174	2015	0.08550683	0.02566775	1	16.356362	1	6	3.4170351	0.81620959
174	2014	0.27900731	0.03328583	1	16.469584	1	6	3.38353081	1.0208165
174	2013	0.34608163	0.08580148	1	16.528383	1	6	3.55788786	1.36292696
174	2012	0.4536678	0.13095896	1	16.4572	1	6	3.68340002	1.54161336
175	2016	0.16838912	0.29337459	1	16.616466	1	6	4.20853172	1.40399773
175	2015	0.08634099	0.34946179	1	16.647465	1	6	4.2431131	1.44984693
175	2014	0.10317463	0.35100681	1	16.667303	1	6	4.21174769	1.36017161
175	2013	0.24286618	0.36917657	1	16.756251	1	6	4.41238444	1.55035075
175	2012	0.23568221	0.44986406	1	16.649659	1	6	4.47987033	1.71868542
176	2016	0.32803964	0.6582384	1	15.421737	0	6	4.14798956	2.09804431
176	2015	0.12448939	0.41977819	1	15.495042	0	6	4.19797889	1.82519312
176	2014	0.18848916	0.26181103	1	15.539884	0	6	4.0815529	1.66226772
176	2013	0.1583985	0.31183698	1	15.626217	0	6	4.31085702	1.79916035
176	2012	0.15568151	0.33305283	1	15.510174	0	6	4.37577594	1.98125592

177	2016	0.00092058	0.03530344	1	14.460876	1	7	4.3247701	0.00019298
177	2015	0.00698257	0.0112663	1	14.46457	1	7	4.1643553	0.00257568
177	2014	0.00824789	0.06313066	1	14.455549	1	7	4.19259061	0.0004509
177	2013	0.00027096	0.00753851	1	14.363206	1	7	4.30776173	0.00277016
177	2012	0.93709208	0.52202072	1	14.082355	1	7	4.12640851	0.95958927
178	2016	0.20286084	0.05119964	1	19.876856	1	6	4.1956743	0.87573412
178	2015	0.24737713	0.05264748	1	20.041694	1	7	4.22638601	0.91944096
178	2014	0.62921381	0.07529484	1	20.20385	1	7	3.83512643	0.970552
178	2013	0.80082735	0.37196072	1	20.657191	1	6	3.98391437	1.73251217
178	2012	0.87448575	0.57522476	1	20.602161	1	6	4.1154859	2.04875306
179	2016	0.22115117	0.2004815	1	17.545657	1	6	4.23173769	1.65756023
179	2015	0.27990415	0.23772236	1	17.582881	1	6	4.19666618	1.65716446
179	2014	0.21445471	0.26986987	1	17.682422	1	6	4.14778337	1.6758266
179	2013	0.10635982	0.36763724	1	17.778798	1	6	4.27603019	1.83793718
179	2012	0.21654825	0.39428754	1	17.699891	1	6	4.28149986	1.86861572
180	2016	0.27817099	0.90848636	1	12.028722	1	4	4.19122607	3.25782354
180	2015	0.08827549	0.44709574	1	12.042948	1	4	4.0758623	3.18674247
180	2014	0.13475989	0.82404693	1	12.11733	1	4	4.01789724	3.15011533
180	2013	0.46702482	1.54134835	1	12.2924	1	4	4.28141228	3.44954472
180	2012	0.84455281	1.84440252	1	12.1254	1	4	4.21351218	3.44183757
181	2016	0.42451974	0.09283712	1	14.07094	1	6	4.41980742	1.98243919
181	2015	0.46375477	0.0071742	1	14.02326	1	6	4.31495836	2.20447534
181	2014	0.83054633	0.77294124	1	14.078115	1	6	4.30172266	2.58339986
181	2013	0.65916218	1.12378641	1	14.240884	1	6	4.45165879	2.82491222
181	2012	0.28018831	1.02148247	1	14.194679	1	6	4.53743535	2.69268943
182	2016	0.19385397	0.0958464	1	19.116103	0	6	3.90699599	1.7940116

182	2015	0.11379733	0.21543068	1	19.233067	0	6	3.76154036	1.74083523
182	2014	0.23366639	0.2931859	1	19.463332	0	5	3.69978705	1.87102049
182	2013	0.33960945	0.37683035	1	19.664273	0	5	3.80886668	2.08353353
182	2012	0.4270074	1.96318016	1	19.735695	0	5	3.83203026	1.99215026
183	2016	0.47341904	0.22460009	1	18.07561	1	6	4.44832717	1.54990742
183	2015	0.69378648	0.24680617	1	17.97225	1	6	4.24997409	1.41446336
183	2014	0.47030358	0.31731053	1	18.05839	1	5	4.23076365	1.50498609
183	2013	0.84808127	0.4085756	1	18.146738	1	5	4.31789476	1.61268145
183	2012	1.0423731	0.53260688	1	18.155987	1	5	4.29172438	1.47105936
184	2016	0.04814996	0.05356257	0	13.509898	0	7	4.10983488	1.08601832
184	2015	0.0518322	0.13518977	0	13.529115	0	7	4.00727629	1.01873323
184	2014	0.05057714	0.07651465	0	13.617726	0	7	3.90553349	0.96457791
184	2013	0.02856219	0.17104404	0	13.765488	0	6	4.01958723	1.06154539
184	2012	0.10535052	0.18779074	0	13.71148	0	6	3.91711968	1.04111276
185	2016	0.20976648	0.1204302	0	17.128958	1	7	4.3821707	1.48246894
185	2015	0.1935071	0.15362711	0	17.173935	1	7	4.33349458	1.50108002
185	2014	0.19426413	0.17711888	0	17.245399	1	7	4.37037745	1.53981341
185	2013	0.20427383	0.25894381	0	17.305607	1	6	4.5327537	1.64959204
185	2012	0.20562947	0.19936384	0	17.27782	1	6	4.4789532	1.59914048
186	2016	0.3223936	0.24506472	0	15.220826	0	7	4.37352341	1.95439349
186	2015	0.13263224	0.28876199	0	15.245072	0	7	4.31177877	1.89009552
186	2014	0.03247203	0.2420077	0	15.328906	0	7	4.30183436	1.89975955
186	2013	0.05493316	0.33850374	0	15.404704	0	6	4.3509793	1.95865149
186	2012	0.0131245	0.35155084	0	15.457852	0	6	4.28536392	1.84601783
187	2016	0.07380978	0.21818005	0	14.273743	1	7	4.41114034	1.17539368
187	2015	0.04012511	0.12813197	0	14.177844	1	7	4.18645022	1.10595857

187	2014	0.04959365	0.11183561	0	14.337382	1	7	4.21585683	1.11176573
187	2013	0.08084515	0.10403564	0	14.405396	1	6	4.34146233	1.19389247
187	2012	0.12116398	0.10742109	0	14.340564	1	6	4.2611785	1.09024471
188	2016	0.04342149	0.13785839	0	14.364596	1	7	4.24642353	1.69557157
188	2015	0.00538149	0.16282863	0	14.409105	1	7	4.18113988	1.70424451
188	2014	0.16623113	0.26628886	0	14.531111	1	7	4.16928463	1.93415533
188	2013	0.00147491	0.31975543	0	14.656081	1	7	4.31498325	1.96053173
188	2012	0.02404167	0.31159389	0	14.613772	1	7	4.2798847	1.86999901
189	2016	0.09901784	0.2530619	0	14.258784	1	7	4.59315843	1.72850688
189	2015	0.16561613	0.253755	0	14.134157	1	7	4.54785259	1.63581301
189	2014	0.52721715	0.43301672	0	14.094211	1	7	4.40449616	1.71802663
189	2013	0.16381554	0.58534257	0	14.192323	1	6	4.64674609	1.88222566
189	2012	0.15925591	0.39192316	0	14.01291	1	6	4.67893879	1.88272492
190	2016	0.09659027	0.11369826	0	16.820579	1	7	4.33902952	0.98650313
190	2015	0.05307146	0.09519836	0	16.68071	1	7	4.32265752	0.83131176
190	2014	0.09768645	0.13354877	0	16.653725	1	7	4.35968184	0.94269661
190	2013	0.14460065	0.14541636	0	16.653518	1	6	4.51360724	1.06270977
190	2012	0.25426153	0.08009871	0	16.56694	1	6	4.23463554	0.88026804
191	2016	0.22005559	0.14496923	1	20.065342	1	7	3.82938343	1.21436096
191	2015	0.19222733	0.13293697	1	20.028782	1	7	3.71293184	1.17404778
191	2014	0.17370958	0.14108802	1	20.069207	1	7	3.69997304	1.21948004
191	2013	0.18761253	0.2134067	1	20.127718	1	7	3.82038881	1.34682198
191	2012	0.24232089	0.21211253	1	20.07714	1	6	3.81132759	1.31342739
192	2016	0.11619689	0.02936849	0	14.482619	0	7	4.43399337	2.02317339
192	2015	0.09700874	0.29333805	0	14.489941	0	7	4.38074541	1.98559394
192	2014	0.23654613	0.02691259	0	14.511617	0	7	4.37670751	2.13014832

192	2013	0.09669104	0.08168966	0	14.584992	0	6	4.54463689	2.29221582
192	2012	0.1470009	0.39376897	0	14.541007	0	6	4.50126281	2.30739152
193	2016	0.25531796	0.19517855	0	14.462739	0	7	4.37965475	1.99538634
193	2015	0.47854393	0.23342729	0	14.478538	0	7	4.32635581	2.03357992
193	2014	0.30314146	0.64927627	0	14.566576	0	7	4.29622083	1.96266121
193	2013	0.23822131	0.64534515	0	14.6986	0	7	4.55930606	1.99212912
193	2012	0.51523031	0.43219077	0	14.560213	0	7	4.60512453	2.07212081
194	2016	0.15542901	0.18716979	0	14.777701	0	7	4.44681332	1.49439759
194	2015	0.23052107	0.3135267	0	14.734115	0	7	4.43555444	1.52468036
194	2014	0.17395583	0.2674161	0	14.712578	0	7	4.38152172	1.59721734
194	2013	0.17377934	0.31492241	0	14.727676	0	6	4.62055598	1.77828425
194	2012	0.36746898	0.25312246	0	14.528937	0	6	4.57334507	1.78906467
195	2016	0.30722731	0.30426777	0	13.76285	0	7	4.25161225	2.05359808
195	2015	0.25801868	0.04368764	0	13.745602	0	7	4.17734592	2.05084555
195	2014	0.09954212	0.02253028	0	13.822376	0	7	4.11395729	2.00978448
195	2013	0.0634667	0.02445063	0	13.923105	0	6	4.45249676	2.14833833
195	2012	0.05576767	0.03700191	0	13.725321	0	6	4.40176751	2.0432576
196	2016	0.17562921	0.00757424	0	14.941094	1	7	4.48904818	1.50624105
196	2015	0.16093447	0.10261706	0	14.961979	1	7	4.44878952	1.500499
196	2014	0.2027547	0.28962768	0	15.017745	1	7	4.43537947	1.62410049
196	2013	0.02974131	0.212972	0	15.126035	1	7	4.4853522	1.53930618
196	2012	0.03235199	0.09301026	0	15.180933	1	7	4.55965337	1.57310707
197	2016	0.02624458	0.06358963	0	13.501661	0	7	3.9914091	2.49692662
197	2015	0.08486215	0.03144731	0	13.575606	0	7	4.06955224	2.18798446
197	2014	0.83166444	0.36473269	0	13.62278	0	7	3.90221236	2.15121054
197	2013	0.02344989	0.91607671	0	13.838647	0	7	3.67427807	2.11796141

197	2012	0.02488674	0.64779986	0	13.854581	0	7	3.50460181	2.09445268
198	2016	0.49080331	0.37486087	0	15.0677	0	7	4.36088669	2.05920809
198	2015	0.30057411	0.03902839	0	15.097531	0	7	4.31137269	2.02989514
198	2014	0.04289472	0.01139879	0	15.167503	0	7	4.25892773	2.0433132
198	2013	0.01670765	0.00618185	0	15.286292	0	7	4.4926135	2.14535346
198	2012	0.01141955	0.00269237	0	15.180196	0	7	4.47482736	1.96995238
199	2016	0.0141583	0.08531861	0	14.741024	1	7	4.21643418	0.59009456
199	2015	0.01505904	0.0682566	0	14.837572	1	7	4.17126497	0.66413281
199	2014	0.02450821	0.06297668	0	14.937716	1	7	4.22149422	0.8784227
199	2013	0.01792439	0.14316138	0	15.026392	1	7	4.34025703	0.99081844
199	2012	0.02014963	0.19247649	0	15.035696	1	7	4.34064598	0.83688209
200	2016	0.01420956	0.0122062	1	18.055603	0	7	4.15846074	0.59250773
200	2015	0.01852632	0.07249832	1	18.014925	0	7	4.04767603	0.64177809
200	2014	0.01736633	0.03235876	1	18.063869	0	7	4.00416058	0.60649119
200	2013	0.017946	0.00925306	1	18.121506	0	7	4.16518818	0.68945036
200	2012	0.02184075	0.02937626	1	17.999167	0	7	4.12412539	0.71080879
201	2016	0.01172895	0.03787462	1	19.225491	1	7	4.10931852	0.66878635
201	2015	0.01027008	0.09746422	1	19.274444	1	7	3.96051598	0.77189736
201	2014	0.00577827	0.43108867	1	19.456786	1	7	3.83547445	0.78388191
201	2013	0.05855377	0.21344386	1	19.680098	1	7	3.92194644	0.8279228
201	2012	0.02305224	0.1409673	1	19.751696	1	7	3.91058826	0.88616425
202	2016	0.12612591	0.46406855	1	13.695395	0	6	3.4130609	2.50497395
202	2015	0.06907353	0.72305883	1	13.685944	0	6	3.17443592	2.32449608
202	2014	0.04139719	0.98721842	1	13.912645	0	6	3.36355865	2.30892535
202	2013	0.57180858	0.82227891	1	13.882941	0	6	3.50283179	2.32281626
202	2012	0.01684728	0.98654899	1	13.89865	0	6	3.89599059	2.31055495

203	2016	0.02566677	0.5119388	1	13.887633	0	6	3.88807267	2.59399152
203	2015	0.09657302	0.83282347	1	13.944236	0	6	3.82315511	2.53418622
203	2014	0.03742391	0.81193993	1	14.050403	0	6	4.48001265	3.07531668
203	2013	0.00587968	0.60805977	1	13.553866	0	6	4.07178595	1.91192544
203	2012	0.07048456	0.82033034	1	13.499508	0	6	4.15749556	1.90987697
204	2016	1.10564417	0.81264652	1	13.142633	0	6	4.0427273	2.55077639
204	2015	0.48243849	0.69848242	1	13.286617	0	6	3.98690366	2.52383678
204	2014	0.79518423	1.15585268	1	13.408412	0	6	4.16290814	2.61527739
204	2013	0.24516567	0.46856822	1	13.392722	0	6	4.38278376	2.20326938
204	2012	0.1699301	0.76272828	1	13.423506	0	6	4.40996309	2.58961037
205	2016	0.01927406	0.47723926	1	14.073375	0	6	4.07064768	2.82122661
205	2015	0.01012952	0.55368509	1	14.032602	0	6	3.8984393	2.63068596
205	2014	0.31208294	0.80953992	1	14.202992	0	6	3.90131965	2.54576858
205	2013	0.17497967	0.58580749	1	14.300945	0	6	4.15909637	2.67929545
205	2012	0.05274709	0.73806127	1	14.186232	0	6	4.39190688	2.7589336
206	2016	0.02394013	0.06144311	1	19.042769	0	7	3.89227825	0.81949257
206	2015	0.02604097	0.04304512	1	19.076431	0	7	3.69859493	0.66047883
206	2014	0.04064566	0.02377707	1	19.279469	0	6	3.74006596	0.69044854
206	2013	0.01986929	0.05219958	1	19.345211	0	6	3.76864055	0.7100397
206	2012	0.02108905	0.13036752	1	19.453731	0	6	3.66221708	0.7470367
207	2016	0.78344619	0.88428435	1	15.406297	0	6	4.10213198	1.99528926
207	2015	0.75453339	0.9027304	1	15.256262	0	7	4.01140485	1.81242349
207	2014	0.54716372	0.49725394	1	15.218401	0	7	4.13921842	1.71462011
207	2013	0.70722364	0.53070472	1	15.138777	0	6	4.08875696	1.56316882
207	2012	0.61124437	0.6134804	1	15.043328	0	6	4.21697645	1.8043163
208	2016	0.03098594	0.35419146	1	15.89385	1	7	4.28581577	1.68132797

208	2015	0.01352019	0.49113625	1	15.855426	1	7	4.19318668	1.96931357
208	2014	0.01179121	0.49862388	1	15.935878	1	7	4.17707814	1.91827567
208	2013	0.00966514	0.51334505	1	16.045559	1	7	4.37144866	1.98770187
208	2012	0.0224589	0.47605342	1	15.987968	1	7	4.36320307	1.72210066
209	2016	0.09796665	0.03113717	0	14.977463	1	7	4.53346457	0.8319961
209	2015	0.08566656	0.02096763	0	14.86971	1	7	4.52603458	0.9213909
209	2014	0.12272193	0.05066555	0	14.817325	1	7	4.51007502	0.94413856
209	2013	0.12362461	0.22823696	0	14.861215	1	6	4.62883536	1.28904999
209	2012	0.2036614	0.16820657	0	14.760506	1	6	4.61563046	1.30602394
210	2016	0.44641893	0.31634023	0	14.475846	0	7	5.07682554	2.79795135
210	2015	0.90672351	0.16138729	0	13.408628	0	7	4.17077681	2.03071482
210	2014	0.53277536	0.29716472	0	13.513191	0	7	4.1979843	2.12273951
210	2013	0.14127645	0.26714359	0	13.666672	0	7	4.30874351	2.06507635
210	2012	0.24622316	0.40706849	0	13.707424	0	7	4.37101627	2.02603272
211	2016	0.64713047	0.45474468	1	16.66626	1	6	4.3775332	2.00189762
211	2015	0.46579102	0.53654249	1	16.634351	1	6	4.76250704	2.33493204
211	2014	0.2722529	0.55205355	1	16.26191	1	6	4.27846052	1.92980574
211	2013	0.30416375	0.50480111	1	16.290215	1	6	4.30076063	1.95824152
211	2012	0.23739985	0.63494852	1	16.300457	1	6	4.47591996	1.99996994
212	2016	0.23966551	0.71418532	1	18.385443	0	7	4.37173157	1.9894981
212	2015	0.23288475	0.73456356	1	18.40538	0	7	4.22052052	1.86696697
212	2014	0.18734227	0.75605109	1	18.552873	0	7	4.33162032	1.94058097
212	2013	0.26623982	0.79548759	1	18.553696	0	7	4.27566744	1.96917303
212	2012	0.18416486	0.89088102	1	18.63128	0	6	4.35663145	1.33439667
213	2016	0.24423554	0.03080172	0	14.074958	0	7	4.38208291	1.19681313
213	2015	0.19526986	0.0004509	0	14.05219	0	7	4.26465515	1.20717936

213	2014	0.13712979	0.05310086	0	14.186292	0	7	4.24258465	1.15493496
213	2013	0.15232788	0.1256445	0	14.340073	0	7	4.41509045	1.29149565
213	2012	0.12744994	0.17688179	0	14.294974	0	7	4.42496941	1.35783316
214	2016	0.03191428	0.14252421	1	21.506858	1	7	3.56952067	1.11243399
214	2015	0.02412855	0.14624782	1	21.49849	1	7	3.40854764	1.02805391
214	2014	0.02754026	0.16238412	1	21.648559	1	7	3.49315793	1.13370365
214	2013	0.03281176	0.17165655	1	21.638312	1	6	3.54141502	1.23245268
214	2012	0.02211466	0.17835286	1	21.646079	1	6	3.51474566	1.17999133
215	2016	0.04195735	0.0395274	0	15.880741	1	7	4.70973822	1.18351272
215	2015	0.08962039	0.07263224	0	15.75638	1	7	4.76273399	1.32159503
215	2014	0.08405158	0.10469509	0	15.517146	1	7	4.39487938	1.39573788
215	2013	0.13568233	0.13956105	0	15.52525	1	6	4.56494088	1.55003265
215	2012	0.25246077	0.10844984	0	15.386854	1	6	4.28777781	1.60145796
216	2016	0.02195521	0.10844087	1	20.987218	1	7	3.9775172	1.08222407
216	2015	0.01605542	0.11757146	1	20.962288	1	7	3.80402669	0.99299544
216	2014	0.01794404	0.1232525	1	21.11882	1	7	3.85592389	1.03208566
216	2013	0.02139645	0.14869066	1	21.161164	1	7	3.97164556	1.14775858
216	2012	0.02046613	0.1360481	1	21.138047	1	6	3.93736803	1.09721198
217	2016	0.01446882	0.06031963	1	20.508163	1	7	3.37434835	0.80750837
217	2015	0.01182975	0.05110368	1	20.485438	1	7	3.14443642	0.70468486
217	2014	0.011976	0.04269735	1	20.698877	1	7	3.28645514	0.78157372
217	2013	0.01487975	0.06696869	1	20.711252	1	6	3.32987755	0.88993361
217	2012	0.0152452	0.05047636	1	20.746435	1	6	3.33262449	0.83321342
218	2016	0.47235586	0.68284429	1	18.04197	1	6	4.28912193	2.92635749
218	2015	0.26693228	0.71465277	1	18.015642	1	6	4.18374844	2.88180679
218	2014	0.16001204	0.76943531	1	18.114682	1	6	4.15272721	2.75017189

218	2013	0.15201698	0.84389422	1	18.260166	1	6	4.38051671	2.86500318
218	2012	0.3074222	0.9615176	1	18.213962	1	6	4.40672833	2.6450749
219	2016	0.13003479	0.05003701	1	17.235851	1	6	4.16093956	0.33287793
219	2015	0.09487372	0.05010168	1	17.603546	1	7	4.35401315	0.71919984
219	2014	0.12641412	0.18429128	1	17.661728	1	7	4.24988194	0.66294361
219	2013	0.15048597	0.19563586	1	17.884671	1	6	4.42901985	0.85463998
219	2012	0.31395198	0.14673669	1	17.921329	1	6	4.42643941	0.94570972
220	2016	0.08910094	0.46771664	1	16.30509	0	5	4.02071654	2.19130587
220	2015	0.06120986	0.70460133	1	16.308667	0	5	3.9819386	2.40667048
220	2014	0.04556019	1.11355837	1	16.341711	0	4	3.93806803	2.54170049
220	2013	0.14155338	1.66916519	1	16.50631	0	4	4.11736905	2.92834731
220	2012	0.12883639	1.55293465	1	16.493899	0	4	4.18276447	2.78325693
221	2016	0.0175383	0.12418472	1	18.047211	1	7	3.48177524	1.02897421
221	2015	0.00833616	0.13451603	1	17.902156	1	7	3.35442197	0.98710887
221	2014	0.01344915	0.15105446	1	17.957238	1	7	3.37070752	1.02013782
221	2013	0.00962949	0.18033041	1	17.975411	1	6	3.4914786	1.14326789
221	2012	0.0145181	0.15522353	1	17.927099	1	6	3.47151154	1.07560736
222	2016	0.18397935	0.37555833	0	13.220551	0	7	4.2902726	2.80143908
222	2015	0.2469382	0.46938531	0	13.455568	0	7	4.23916297	2.63627066
222	2014	0.09208316	0.16353961	0	13.764605	0	7	4.27590134	2.55685972
222	2013	0.01286292	0.24223769	0	13.990353	0	7	4.44126553	2.57793301
222	2012	0.02866131	0.22325395	0	14.077581	0	7	4.46313697	2.44110331
223	2016	0.43952702	0.29397399	1	13.835901	1	5	3.8112069	2.74482549
223	2015	0.01980263	0.07441892	1	13.701168	1	5	3.44848677	2.51684434
223	2014	0.39837134	1.09013748	1	13.979223	1	5	3.4563087	2.16586187
223	2013	0.12545398	1.14441609	1	14.054051	1	5	3.38231795	2.62240226

223	2012	0.35519235	1.13697013	1	13.947903	1	5	3.26228479	2.02472635
224	2016	0.9492337	0.71652234	1	17.665133	1	7	4.22511235	1.76553629
224	2015	0.9691082	0.71502021	1	17.722498	1	7	4.05681201	1.73138064
224	2014	1.09043125	1.00115454	1	17.916149	1	7	4.08536248	1.86351005
224	2013	1.27805136	1.23930945	1	18.039954	1	7	4.1766514	2.01201258
224	2012	1.63278953	1.42418222	1	18.143621	1	7	4.29865573	2.16678897
225	2016	1.00723503	0.56153053	0	10.252754	1	7	4.17198548	2.53264801
225	2015	0.5161367	1.39627786	0	10.30237	1	7	4.22187701	2.63304299
225	2014	0.05963872	0.74231489	0	10.312844	1	7	4.32226286	2.91314942
225	2013	0.59646887	0.36912265	0	10.330764	1	6	4.62634398	3.31841693
225	2012	0.73974303	1.30764664	0	10.187342	1	6	4.65327433	3.02583835
226	2016	0.00680976	0.03539996	1	18.983253	1	7	1.45692825	0.44254379
226	2015	0.01480092	0.0959636	1	18.94935	1	7	1.95017618	0.42171634
226	2014	0.00835797	0.00429775	1	19.017299	1	7	2.16479241	0.37942157
226	2013	0.01101412	0.01483935	1	19.100408	1	6	1.56373507	0.24290069
226	2012	0.00617987	0.02949861	1	19.750943	1	6	1.83185352	0.25105984
227	2016	0.10971681	0.03966196	1	16.829315	1	7	4.35825448	1.05379134
227	2015	0.12451058	0.05662038	1	16.829645	1	7	4.30871128	1.04492983
227	2014	0.09762296	0.06918832	1	16.873419	1	7	4.2665128	1.05251041
227	2013	0.09475548	0.18326028	1	16.99447	1	6	4.4275905	1.10729548
227	2012	0.09969329	0.0861832	1	16.945473	1	6	4.43469084	1.04955614
228	2016	0.08381619	0.13156408	1	17.065071	1	7	4.44201542	0.95555375
228	2015	0.09262841	0.08056103	1	16.967917	1	7	4.29623419	0.93405285
228	2014	0.13719517	0.0668284	1	17.023108	1	7	4.23004317	0.96866684
228	2013	0.11243811	0.16311325	1	17.105825	1	6	4.37373113	1.06097515
228	2012	0.21090577	0.06851342	1	17.088123	1	6	4.37923825	1.03703046

229	2016	0.17806919	0.21547019	1	16.588642	0	7	4.41926734	1.15243706
229	2015	0.21710938	0.13751071	1	16.54868	0	7	4.31774843	1.1303212
229	2014	0.18778991	0.17964214	1	16.634034	0	7	4.29571229	1.14306959
229	2013	0.24609025	0.2300429	1	16.73525	0	6	4.46920502	1.21232245
229	2012	0.24591823	0.07564722	1	16.694099	0	6	4.50433114	1.23953066
230	2016	0.25034462	0.11335904	1	16.737986	1	7	4.29562979	1.12791507
230	2015	0.21951297	0.13438141	1	16.734109	1	7	4.22231108	1.09589894
230	2014	0.30272117	0.19433082	1	16.789583	1	7	4.16869368	1.18451044
230	2013	0.22288752	0.14097338	1	16.906994	1	6	4.1928252	1.1666148
230	2012	0.21964223	0.14042955	1	16.987104	1	6	4.27905393	1.2278691
231	2016	0.144238	0.0932517	1	16.952009	0	7	4.41557181	1.19013865
231	2015	0.15504028	0.10042074	1	16.885955	0	7	4.32385025	1.16269946
231	2014	0.12709598	0.1601586	1	16.942643	0	7	4.26238293	1.16649583
231	2013	0.13203039	0.2061455	1	17.051197	0	6	4.45295528	1.28582409
231	2012	0.11734205	0.1093117	1	16.97948	0	6	4.43694996	1.24696016
232	2016	0.10406448	0.07335269	1	16.301907	0	7	4.39868221	1.08560168
232	2015	0.09097991	0.07510283	1	16.268938	0	7	4.2967153	1.04931209
232	2014	0.10951876	0.13129665	1	16.33619	0	7	4.3103544	1.09720864
232	2013	0.08775077	0.09622067	1	16.440005	0	6	4.50900001	1.1566903
232	2012	0.11801501	0.12033178	1	16.348565	0	6	4.46511992	1.09745028
233	2016	0.16134644	0.16695154	1	16.355852	0	7	4.36914131	1.20491066
233	2015	0.20797225	0.15102695	1	16.315026	0	7	4.2134612	1.15453158
233	2014	0.15065286	0.2108013	1	16.474623	0	7	4.19608948	1.1511592
233	2013	0.03615255	0.24298853	1	16.599464	0	7	4.4457263	1.24944318
233	2012	0.16131325	0.16595587	1	16.479985	0	7	4.444523	1.23084421
234	2016	0.14233775	0.04346841	1	16.49235	1	7	4.37793462	0.97384995

234	2015	0.11348939	0.08537462	1	16.456837	1	7	4.24877933	0.93513565
234	2014	0.10586519	0.16712924	1	16.556988	1	7	4.26028198	0.94786381
234	2013	0.07676936	0.11821405	1	16.656864	1	6	4.43316744	0.96457906
234	2012	0.08242571	0.02600297	1	16.590808	1	6	4.456727	0.91086564
235	2016	0.0910776	0.1286456	1	17.578536	1	7	4.36177446	0.69112263
235	2015	0.05847266	0.0750379	1	17.526236	1	7	4.28626592	0.55559113
235	2014	0.1275274	0.03474726	1	17.600356	1	7	4.24473702	0.59143279
235	2013	0.16285157	0.04332765	1	17.689721	1	6	4.44119071	0.760359
235	2012	0.2537938	0.15899237	1	17.634163	1	6	4.44924427	0.90297365
236	2016	0.25802177	0.07497481	1	17.033469	0	7	4.28034363	1.28154199
236	2015	0.21825964	0.10333787	1	17.045631	0	7	4.24305579	1.32943825
236	2014	0.23114743	0.16784646	1	17.089324	0	7	4.26018341	1.40499172
236	2013	0.29324482	0.27774991	1	17.157945	0	6	4.36150806	1.49822452
236	2012	0.23682631	0.32431579	1	17.178832	0	6	4.39160821	1.45449515
237	2016	0.11534986	0.25555111	1	16.106174	1	7	4.33534007	1.19712703
237	2015	0.18164383	0.21709248	1	16.11298	1	7	4.23924372	1.15492992
237	2014	0.13445746	0.11455829	1	16.218758	1	7	4.16330411	1.10921356
237	2013	0.19324584	0.20231943	1	16.405493	1	6	4.41284264	1.22444286
237	2012	0.10381122	0.18698898	1	16.288001	1	6	4.47141889	1.19711192
238	2016	0.22617256	0.1648566	1	16.242747	0	7	4.35033721	1.2063824
238	2015	0.24806248	0.18565267	1	16.216193	0	7	4.25900031	1.16018861
238	2014	0.18802112	0.32258193	1	16.279112	0	7	4.20505027	1.12138892
238	2013	0.19769938	0.39142906	1	16.428376	0	6	4.32956194	1.15411858
238	2012	0.22806343	0.28799003	1	16.416164	0	6	4.32768614	1.07689313
239	2016	0.11630372	0.08271483	1	17.169819	1	7	4.34738568	1.09363057
239	2015	0.11767814	0.07430288	1	17.14405	1	7	4.24919223	1.0570414

239	2014	0.23001906	0.10133201	1	17.222501	1	7	4.13187919	1.09054349
239	2013	0.17421966	0.24370746	1	17.403486	1	6	4.11626778	1.03769458
239	2012	0.13353214	0.28571865	1	17.572599	1	6	4.35622187	1.18248182
240	2016	0.08105911	0.0600494	1	16.770087	0	7	4.36352147	0.75224452
240	2015	0.06789974	0.09305127	1	16.74292	0	7	4.34186377	0.7524481
240	2014	0.08391826	0.08072801	1	16.742953	0	7	4.29514463	0.73505994
240	2013	0.10336402	0.07768578	1	16.836487	0	6	4.42850195	0.74341768
240	2012	0.16921521	0.07883151	1	16.814286	0	6	4.44021364	0.78495806
241	2016	0.17482771	0.00181236	1	16.183908	1	7	4.36908685	1.13005734
241	2015	0.1874857	0.10287964	1	16.14637	1	7	4.28003343	1.16154076
241	2014	0.2219148	0.14168271	1	16.204386	1	7	4.22263107	1.19150105
241	2013	0.20220343	0.21712145	1	16.33444	1	6	4.39903609	1.30057143
241	2012	0.23705671	0.12332675	1	16.268723	1	6	4.41788686	1.29751561
242	2016	0.10539642	0.31312903	1	14.378885	1	6	3.99377149	2.51151872
242	2015	0.06612757	0.44909085	1	14.443278	1	6	3.89947669	2.33553261
242	2014	0.08321275	0.60405254	1	14.570646	1	6	3.93815881	2.19553103
242	2013	0.06569691	0.52734817	1	14.662044	1	6	4.18550899	2.22651916
242	2012	0.10647489	0.62582131	1	14.590345	1	6	4.31356789	2.11968469
243	2016	0.1169587	0.06810808	1	15.261563	1	6	2.2126827	1.21893077
243	2015	0.04363882	0.23787373	1	15.609647	1	6	1.93218568	0.97169743
243	2014	0.00141799	0.28667256	1	16.145792	1	6	2.68418822	0.89007693
243	2013	0.00153083	0.25542486	1	16.342706	1	6	2.29464284	0.90275554
243	2012	0.00053985	0.34336415	1	16.276711	1	6	2.79400628	0.98645055
244	2016	0.00020998	0.04323285	1	19.885391	1	6	4.17042188	0.13143081
244	2015	0	0.02636439	1	19.886691	1	6	4.08219838	0.08653176
244	2014	0	0.03175057	1	20.005171	1	6	4.25062636	0.09019348

244	2013	0	0.01695347	1	19.967261	1	6	4.37192606	0.10639848
244	2012	0	0.00781637	1	19.887381	1	6	4.46010202	0.05341469
245	2016	0.51142984	0.36992497	1	15.170617	1	6	3.80871884	2.42251125
245	2015	0.29493421	0.4122997	1	15.204084	1	6	3.64409694	2.19367451
245	2014	0.15826108	0.55383166	1	15.463429	1	6	3.66248581	2.09564468
245	2013	0.08790373	0.39990836	1	15.580084	1	6	4.06374995	2.32740667
245	2012	0.15717467	0.39474586	1	15.348234	1	6	3.99868303	2.04069266
246	2016	0.42848413	0.40856895	1	15.999845	1	6	4.19867887	2.59976749
246	2015	1.47280549	0.41275779	1	16.006366	1	6	4.10902072	2.82586026
246	2014	0.2756601	1.46269066	1	16.144799	1	6	4.07383812	2.71728186
246	2013	0.05224419	0.86416172	1	16.333626	1	6	4.35050263	2.41162253
246	2012	0.32111709	0.63842591	1	16.277142	1	6	4.37444682	2.2485379
247	2016	0.48554228	0.75514921	1	14.106766	1	6	4.37406537	3.2787502
247	2015	0.12888913	0.83716397	1	14.126456	1	6	4.17442759	2.98013253
247	2014	0.1067868	1.30083369	1	14.376497	1	6	4.16924855	2.76803512
247	2013	0.03173217	1.2964435	1	14.514072	1	6	4.4765026	2.74420076
247	2012	0.52492851	0.63809103	1	14.432253	1	6	4.57282811	2.49277354
248	2016	0.11694802	0.34496465	1	14.558211	0	6	3.94381903	1.93531926
248	2015	0.14167229	0.45705959	1	14.586973	0	6	3.88499752	1.84845245
248	2014	0.03723027	0.63790663	1	14.685943	0	6	3.96196656	1.84013796
248	2013	0.01785858	0.68549548	1	14.73706	0	6	4.24470332	1.90259159
248	2012	0.29937025	0.48878306	1	14.584281	0	6	4.40496035	1.84579869
249	2016	0.08092447	0.31378832	1	14.072757	1	6	4.30863332	2.67579936
249	2015	0.01517232	0.60897341	1	14.180862	1	6	4.25983458	2.55537078
249	2014	0.01833194	0.59699084	1	14.252217	1	6	4.25918379	2.42396964
249	2013	0.00755936	0.61438316	1	14.343796	1	6	4.42044397	2.4312234

249	2012	0.00555753	0.45394602	1	14.305997	1	6	4.57044812	2.34680933
250	2016	0.32970942	0.45984091	1	15.798359	1	6	4.06725101	2.3437423
250	2015	0.40060666	0.57543852	1	15.887644	1	6	4.10159895	2.44816201
250	2014	0.38338513	0.56603003	1	15.874709	1	6	4.03402915	2.31512099
250	2013	0.52195308	0.74817168	1	16.018099	1	6	4.22756784	2.39725079
250	2012	0.26638234	0.84410835	1	15.940963	1	6	4.31504246	2.10002205
251	2016	0.34281494	0.49338624	1	13.909884	0	7	4.04015781	2.60469257
251	2015	0.22482374	0.9411765	1	13.950398	0	7	3.97063284	2.53926959
251	2014	0.11565366	0.63057952	1	14.104809	0	7	4.00112814	2.25470533
251	2013	0.3273695	0.91619113	1	14.248757	0	7	4.26951724	2.30204575
251	2012	0.51523688	0.54211671	1	14.1631	0	7	4.35694849	2.10652495
252	2016	1.07995057	0.69127543	1	14.841954	1	6	4.15200498	2.96201627
252	2015	0.53716391	1.1322192	1	14.749536	1	6	4.1030582	2.87319593
252	2014	0.7389209	1.00063004	1	14.851829	1	6	4.02885592	2.61632468
252	2013	0.50450408	0.95495745	1	15.070975	1	6	4.20219752	2.56329861
252	2012	0.51262001	0.96740999	1	15.041909	1	6	4.37135647	2.67689859
253	2016	0	0.00099151	1	15.450722	0	6	3.15706987	0.01993497
253	2015	0.00017798	0.00501839	1	15.36888	0	6	3.08933654	0.02474237
253	2014	0	0.00828756	1	15.391821	0	6	3.01252666	0.03070184
253	2013	0.00029496	0.00370214	1	15.413986	0	6	3.09117181	0.01361687
253	2012	0	0.00501739	1	15.300707	0	6	3.043756	0.02058272
254	2016	0.16596603	0.10883467	1	11.816871	0	6	4.23504298	1.97402075
254	2015	0.07927041	0.1798485	1	11.754902	0	6	4.18468736	2.0434989
254	2014	0.00196407	0.13077209	1	11.800836	0	6	4.21963933	1.52877261
254	2013	0.13719081	0.02304345	1	11.854404	0	6	4.46203116	1.58857213
254	2012	0.26344906	0.20069997	1	11.765981	0	6	4.4120128	1.9528537

255	2016	0	0.14517336	1	12.00002	0	6	4.12019491	2.19186223
255	2015	0.26813298	0.34798005	1	11.979306	0	6	4.03833316	2.36544824
255	2014	0.70112874	0.69934841	1	12.069002	0	6	4.08702207	2.3298465
255	2013	0.42222061	1.0610101	1	12.123669	0	6	4.35805971	2.67030022
255	2012	0	0.4737902	1	12.072103	0	6	4.40789117	2.47092782
256	2016	0.28914026	0.17320092	1	12.942749	0	6	4.10044293	2.01229709
256	2015	0.16975796	0.31083203	1	12.87716	0	6	3.96253977	2.16078936
256	2014	0.2616109	0.19538749	1	13.001515	0	6	3.95569486	2.02251848
256	2013	0.45086222	0.35823932	1	13.100432	0	6	4.1627966	2.27717056
256	2012	0.23083867	0.42701979	1	13.017216	0	6	4.27733821	2.56857095
257	2016	0.037994	0.02810726	1	12.149044	0	6	4.08983893	0.34773924
257	2015	0	0.09032687	1	12.061106	0	6	4.01010813	1.04907254
257	2014	0	0.0503556	1	12.124011	0	6	4.01783469	1.31000412
257	2013	0.01274543	0.03001986	1	12.217198	0	6	4.25006082	1.48658258
257	2012	0.03590754	0.09503014	1	12.14343	0	6	4.28597509	1.75397781
258	2016	0.00054285	0.04055732	1	12.305464	0	6	4.20419657	0.78688977
258	2015	0.04855014	0.04027689	1	12.212809	0	6	4.11473791	0.7774796
258	2014	0.00704314	0.01230498	1	12.318439	0	6	4.0850172	0.8807908
258	2013	0	0.2245929	1	12.416659	0	6	4.25675278	1.34093265
258	2012	0.02141799	0.08809604	1	12.367341	0	6	4.31178839	1.39986536
259	2016	0	0.02267399	1	11.084434	0	6	4.05550357	1.4265967
259	2015	0.01634174	0.07231415	1	11.039048	0	6	3.98847608	1.60512241
259	2014	0	0.17515511	1	11.068692	0	6	3.97248406	1.68549262
259	2013	0	0.01001469	1	11.079294	0	6	4.14919479	1.88338758
259	2012	0.00575143	0.03873502	1	11.016164	0	6	4.13669547	2.11667723
260	2016	0.20546012	0.25381474	1	13.27884	0	6	4.25328451	2.10137217

260	2015	0.16813727	0.07587249	1	13.218889	0	6	4.14400183	2.2484885
260	2014	0.06641769	0.15963703	1	13.370658	0	6	4.09135655	2.16634971
260	2013	0.00392728	0.18805426	1	13.48354	0	6	4.34241103	2.40016261
260	2012	0.00017099	0.19741294	1	13.371249	0	6	4.35882706	2.40323969
261	2016	0.55479217	0.10040084	1	13.426337	0	6	4.21947085	1.74628082
261	2015	0.28468709	0.27716269	1	13.363011	0	6	4.15676226	1.9221779
261	2014	0.11044596	0.34659441	1	13.400756	0	6	4.16221873	1.62263781
261	2013	0.1654424	0.22631133	1	13.472111	0	6	4.40012099	1.83443782
261	2012	0.00292572	0.1910335	1	13.375188	0	6	4.47344652	2.03980127
262	2016	0.06260572	0.16848629	1	14.060132	0	6	4.00692974	2.16439716
262	2015	0.01802654	0.4873492	1	13.972117	0	6	3.88484739	2.12333773
262	2014	0.15818937	0.49338319	1	14.118082	0	6	3.96894625	1.97245248
262	2013	0.05044213	0.66777245	1	14.190351	0	6	4.2501338	2.17241411
262	2012	0.22054337	0.29233	1	14.076179	0	6	4.34785304	2.05670808
263	2016	0	0.17242188	1	11.679168	0	6	3.97675159	1.37355455
263	2015	0.00224847	0.0344594	1	11.604566	0	6	3.99408818	1.69748157
263	2014	0	0.24951982	1	11.658796	0	6	3.96178557	1.81004101
263	2013	0	0.0691314	1	11.739732	0	6	4.17229655	1.16950402
263	2012	0	0.02179476	1	11.708054	0	6	4.19158577	1.4278544
264	2016	0	0.04997232	1	11.298007	0	6	3.45161606	0.46805736
264	2015	0	0.06724922	1	11.249228	0	6	3.40661326	0.46700288
264	2014	0	0.00159373	1	11.320018	0	6	3.36471329	0.68160735
264	2013	0	0.0013381	1	11.402403	0	6	3.65845775	0.86187636
264	2012	0	0.01093697	1	11.32563	0	6	3.60006895	0.88298376
265	2016	0	0.04469799	1	12.377648	0	6	4.17409989	1.54866148
265	2015	0	0.15775731	1	12.393663	0	6	4.12941004	1.85966778

265	2014	0	0.23881294	1	12.48578	0	6	4.13125904	1.305334
265	2013	0.00279609	0.35717292	1	12.520323	0	6	4.26623266	1.84490995
265	2012	0.00014199	0.0050552	1	12.45959	0	6	4.32192743	1.54757783
266	2016	0.0188669	0.00759211	1	12.996325	0	6	4.08989858	2.06321459
266	2015	0.0053984	0.43705098	1	13.012123	0	6	4.02753976	2.15410504
266	2014	0.00042691	0.16548562	1	13.071588	0	6	4.0448658	2.03398644
266	2013	0.00502336	0.19467576	1	13.186877	0	6	4.25776251	2.15781097
266	2012	0.00052886	0.39313946	1	13.137505	0	6	4.35151998	2.24360263
267	2016	0.01193648	0.4113935	1	13.526604	0	6	4.22064573	1.9122068
267	2015	0.00357859	0.37384647	1	13.473894	0	6	4.20170113	1.89236017
267	2014	0.0106679	0.02083739	1	13.474045	0	6	4.22582573	1.62045797
267	2013	0.03112069	0.10786647	1	13.566607	0	6	4.42994479	1.7557386
267	2012	0.22127461	0.20778054	1	13.465147	0	6	4.42662102	1.68818088
268	2016	0	0.12459798	1	11.788738	0	6	3.88009412	0.56325658
268	2015	0.07762841	0.22263622	1	11.782346	0	6	3.83468497	0.9423054
268	2014	0	0.18373722	1	11.854336	0	6	3.76364438	0.96037384
268	2013	0	0.02036227	1	11.954219	0	6	3.93768839	0.89068324
268	2012	0.00224747	0.00365232	1	11.831176	0	6	3.91588514	0.93668299
269	2016	0.23944988	0.06302081	1	11.677703	0	6	4.11565984	1.26978751
269	2015	0.06752967	0.09902328	1	11.591273	0	6	4.03216993	1.45194422
269	2014	0	0.06122303	1	11.64168	0	6	4.01623076	1.61463439
269	2013	0	0.15785808	1	11.716945	0	6	4.26304749	1.83767025
269	2012	0	0.18528632	1	11.627988	0	6	4.31709174	2.00011637
270	2016	0.4756688	0.30301664	1	13.138242	0	6	4.24605757	2.16784863
270	2015	0.54697161	0.29861608	1	13.136932	0	6	4.13275073	2.35948977
270	2014	0.00606457	0.6715767	1	13.248335	0	6	4.13856623	2.42773956

270	2013	0.66822212	0.47647825	1	13.350965	0	6	4.36238403	2.51561318
270	2012	0.00163067	0.33553966	1	13.287743	0	6	4.46262401	2.52755362
271	2016	0.01206394	0.06250145	1	11.906416	0	6	4.22279702	1.03618319
271	2015	0.10537212	0.19452924	1	11.877393	0	6	4.15070922	1.1089533
271	2014	0	0.03545787	1	11.966923	0	6	4.17017053	0.59392998
271	2013	0	0.01570798	1	12.019646	0	6	4.32091711	0.62612611
271	2012	0.13433857	0.08079443	1	11.956885	0	6	4.38703772	0.76018087
272	2016	0.47523803	0.23625166	1	12.340872	0	6	4.32782735	2.29381565
272	2015	0.03726977	0.15829351	1	12.304567	0	6	4.24290214	2.19351069
272	2014	0.00065079	0.17994206	1	12.400126	0	6	4.26756742	1.86140741
272	2013	0	0.17707281	1	12.472326	0	6	4.45957267	2.12397946
272	2012	0.0735376	0.31477424	1	12.389813	0	6	4.50033688	2.41456063
273	2016	0	0.13409199	1	11.873899	0	6	4.16473382	1.8827657
273	2015	0.00157975	0.5177784	1	11.840666	0	6	4.17075627	1.9347267
273	2014	0.20458521	0.19086744	1	11.822319	0	6	4.17133695	0.70842685
273	2013	0.64973538	0.01168546	1	11.87489	0	6	4.23700218	1.67474276
273	2012	0	0.10767344	1	11.826714	0	6	3.68565514	1.32025498
274	2016	0	0.02772897	1	11.350969	0	6	3.75548498	1.08874375
274	2015	0	0.09629515	1	11.349927	0	6	3.75639129	1.18783031
274	2014	0	0.07570748	1	11.360461	0	6	3.84177061	1.32151288
274	2013	0	0.20499587	1	11.382118	0	6	4.06275652	1.36280846
274	2012	0	0.12259986	1	11.330493	0	6	4.11630039	0.8886934
275	2016	0	0.32162107	1	11.966043	0	6	4.0287978	1.50979966
275	2015	0	0.17558055	1	11.967067	0	6	3.99778698	1.58107198
275	2014	0	0.06351456	1	12.069561	0	6	4.05590932	1.67949592
275	2013	0.46813689	0.13638669	1	12.211021	0	6	4.29820067	1.74845627

275	2012	0	0.07570562	1	12.155042	0	6	4.39159572	1.60503242
276	2016	0	0.01751865	1	11.659459	0	6	3.94314761	1.21282154
276	2015	0	0.33869833	1	11.60051	0	6	3.76585369	1.25028934
276	2014	0	0.14300017	1	11.727653	0	6	3.80961085	1.31870292
276	2013	0	0.06441695	1	11.764157	0	6	3.95218543	1.50777345
276	2012	0	0.02209705	1	11.658454	0	6	3.13612762	0.87210601
277	2016	0	0.09869898	1	12.28095	0	6	4.18885465	1.63102581
277	2015	0	0.16656135	1	12.200699	0	6	4.06318793	1.84225485
277	2014	0	0.16745493	1	12.307451	0	6	4.03972805	1.89069972
277	2013	0	0.11881894	1	12.389941	0	6	4.2321631	2.39099516
277	2012	0.22516072	0.37128973	1	12.353642	0	6	4.2943966	2.33011611
278	2016	0.22311475	0.49630044	1	11.620085	0	6	4.24272192	2.49181002
278	2015	0.00962057	0.55637225	1	11.632303	0	6	4.14095195	2.36821084
278	2014	0.17243198	1.08386677	1	11.755552	0	6	4.20365262	2.07599599
278	2013	0	0.49420405	1	11.864822	0	6	4.37779134	2.34306376
278	2012	0.18822907	0.00418224	1	11.803956	0	6	4.4312777	2.21493122
279	2016	0.44529781	0.19149105	1	13.261948	0	6	4.20354652	1.88270377
279	2015	0.57415078	0.13487	1	13.192866	0	6	4.18933866	1.96689639
279	2014	0.29407385	0.14118701	1	13.216632	0	6	4.19586799	2.08186498
279	2013	0.99969468	0.41642549	1	13.236605	0	6	4.43515786	2.58860271
279	2012	1.23666233	0.51483776	1	13.101732	0	6	4.39329558	2.78037725
280	2016	0.35364255	0.11779281	1	12.712521	0	7	4.12307733	1.48994737
280	2015	0.01922599	0.09176299	1	12.696952	0	7	4.0597003	1.49704786
280	2014	0.02464481	0.10959583	1	12.777775	0	7	4.06285491	1.79161496
280	2013	0.01382401	0.33032984	1	12.830737	0	7	4.21903456	1.9663991
280	2012	0.22438198	0.02976266	1	12.758338	0	7	4.47272199	2.02564433

281	2016	0	0.41209045	1	12.661178	0	6	4.33635787	2.13453809
281	2015	0.00331051	0.38073858	1	12.611454	0	6	4.25494368	2.03500011
281	2014	0.04392119	0.38133087	1	12.691309	0	6	4.26325042	1.92992463
281	2013	0.00020898	0.04164086	1	12.75359	0	6	4.41510879	2.1670115
281	2012	0.15180565	0.23131487	1	12.720307	0	6	4.41464218	2.066912
282	2016	0.20911034	0.07801789	1	12.007475	0	6	4.1446297	1.4553749
282	2015	0	0.0550032	1	11.99201	0	6	4.06340125	1.06392905
282	2014	0.21928733	0.0101315	1	12.080358	0	6	4.08198959	1.13090295
282	2013	0	0.44315452	1	12.150357	0	6	4.25704929	1.27358748
282	2012	0	0.257061	1	12.099503	0	6	4.22664774	1.16003753
283	2016	0.05480348	0.0635033	1	11.837771	0	6	4.29127698	1.9070021
283	2015	0.03618631	0.30384131	1	11.838309	0	6	4.28418365	2.09502449
283	2014	0	0.12653573	1	11.872642	0	6	4.33496977	2.15682437
283	2013	0	0.14599033	1	11.929176	0	6	4.49051866	2.43307207
283	2012	0	0.02366086	1	11.90345	0	6	4.46419698	2.39262642
284	2016	0.91306072	0.01895815	1	12.878502	0	6	4.00624417	1.74680255
284	2015	0.5328006	0.27355145	1	12.81662	0	6	3.97732199	1.9221166
284	2014	0.59760222	0.90252725	1	12.885267	0	6	4.01998607	2.00862428
284	2013	0	1.00180435	1	12.99725	0	6	4.25804183	2.15527289
284	2012	0.1378096	0.56088413	1	12.942819	0	6	4.38107128	1.87741578
285	2016	0.16134814	0.04917009	1	12.167695	0	6	3.87780913	1.42693282
285	2015	0	0.12458739	1	12.149169	0	6	3.81063634	1.38746592
285	2014	0.98247577	0.03142987	1	12.237506	0	6	3.83113121	1.94112228
285	2013	0	0.00824591	1	12.29002	0	6	4.08505229	2.18527997
285	2012	0.09184874	0.20796737	1	12.213331	0	6	4.16061089	2.31812453
286	2016	0.08471332	0.19601816	1	13.070669	0	6	4.28431402	1.57157736

286	2015	0.03640811	0.15033283	1	13.028285	0	6	4.19673253	1.53455487
286	2014	0.01700067	0.15819535	1	13.120106	0	6	4.23832924	2.02636798
286	2013	0	0.17828592	1	13.161444	0	6	4.44147259	2.20822903
286	2012	0	0.18945274	1	13.10218	0	6	4.48454999	2.10830799
287	2016	0	0.1443436	1	12.894693	0	6	4.24318854	1.26311746
287	2015	0	0.12703521	1	12.873285	0	6	4.1958624	1.32828038
287	2014	0	0.00039892	1	12.939438	0	6	4.29973598	1.50934461
287	2013	0	0.01951435	1	12.924922	0	6	4.44941914	1.87670338
287	2012	0	0.02508571	1	12.858024	0	6	4.39094127	1.80162745
288	2016	0	0.0152058	1	12.308374	0	6	4.17317401	2.06762487
288	2015	0.0733276	0.30443373	1	12.322086	0	6	4.20282519	2.04006564
288	2014	0	1.13255532	1	12.369078	0	6	4.2935337	2.0390917
288	2013	0.02069047	0.15892924	1	12.433725	0	6	4.498985	2.06158111
288	2012	0.04334585	0.17234277	1	12.385903	0	6	4.47897492	2.0612418
289	2016	0.00163466	0.09627244	1	12.993915	0	6	4.30885222	1.72164597
289	2015	0.24954164	0.05025385	1	12.923417	0	6	4.16299193	1.78899666
289	2014	0.17360703	0.10265857	1	13.035116	0	6	4.23168697	1.67711712
289	2013	0.0429819	0.09535291	1	13.070966	0	6	4.42489774	1.84644113
289	2012	0.06648974	0.10295001	1	12.957064	0	6	4.45385105	2.29601314
290	2016	0.83596402	1.22304075	1	13.144654	0	6	4.08569303	2.99676989
290	2015	0.21178327	0.94888454	1	13.168043	0	6	4.03738812	2.86012788
290	2014	0.17477734	0.80797162	1	13.342843	0	6	4.08484115	2.73688402
290	2013	0.0116993	1.12949837	1	13.470835	0	6	4.35330253	2.94715208
290	2012	0.53922356	0.48047363	1	13.381888	0	6	4.41224932	2.73211439
291	2016	1.07702972	0.3732153	1	14.330237	0	6	4.60164979	3.65733409
291	2015	0.78743547	1.19817463	1	13.732157	0	6	3.62865118	2.67474468

291	2014	0.06568193	1.28174602	1	13.964851	0	6	3.85420616	2.79649377
291	2013	0.03750867	0.79072479	1	13.959239	0	6	4.15091966	2.85623679
291	2012	0.03075033	0.55801336	1	13.886069	0	6	4.29363053	2.64299194
292	2016	0.81148295	0.35971153	1	14.49916	0	6	4.0388686	2.68890367
292	2015	0.10967738	0.58544504	1	14.381626	0	6	3.7006172	2.08350303
292	2014	0.02477651	0.7976162	1	14.504665	0	6	3.88519727	1.95920989
292	2013	0.00273226	0.49680925	1	14.45235	0	6	4.13958711	2.13608082
292	2012	0.39282894	0.5653871	1	14.385442	0	6	4.35044293	2.24414951
293	2016	0.30510761	0.66494573	1	13.300252	0	6	4.06068901	2.69237546
293	2015	0.13465152	0.69716609	1	13.252855	0	6	3.93697869	2.63226575
293	2014	0.0184311	1.17322273	1	13.397436	0	6	3.98546616	2.74533642
293	2013	0.05130984	0.67804471	1	13.484849	0	6	4.23271101	2.90494489
293	2012	0.06590103	0.64448096	1	13.429375	0	6	5.27051602	3.71090801
294	2016	0.19050052	0.05893001	1	13.676682	0	6	4.28244372	1.30934609
294	2015	0.03241879	0.34863793	1	13.639639	0	6	4.23659938	1.460142
294	2014	0.14611044	0.20461291	1	13.715857	0	6	4.25613832	1.5939506
294	2013	0.12006665	0.21526621	1	13.828471	0	6	4.46672662	1.77465434
294	2012	0.07192058	0.23328792	1	13.766575	0	6	4.48542055	1.77673263
295	2016	0.74733276	0.48818853	1	12.187365	0	6	4.32116402	2.60592607
295	2015	0.05492938	0.60363322	1	12.215346	0	6	4.05259299	2.50842093
295	2014	0.00135109	0.84500309	1	12.467357	0	6	3.98994231	2.22780195
295	2013	0.28382615	0.73937645	1	12.621085	0	6	4.29184779	2.58885622
295	2012	0	0.51302241	1	12.428523	0	6	4.33265826	2.63459833
296	2016	0.44993484	0.54718513	1	12.283644	0	6	3.83239149	2.62182949
296	2015	0.01380034	1.13240548	1	12.629886	0	6	3.74402472	2.4999725
296	2014	0.564613	0.73867202	1	12.785386	0	6	3.90027891	2.5649509

296	2013	0.09435427	0.74704144	1	12.773736	0	6	4.11708354	2.61183309
296	2012	0.53099701	0.78122445	1	12.683563	0	6	4.33565082	2.6333291
297	2016	1.40723188	1.50224706	1	12.342165	0	6	4.24181167	3.27902519
297	2015	0.02919369	0.8221229	1	12.40125	0	6	4.11429901	3.0192312
297	2014	0.01000082	0.84424721	1	12.659907	0	6	4.19906016	2.90510749
297	2013	0.01342843	0.56412845	1	12.742222	0	6	4.39875	2.83971294
297	2012	0.12939359	0.48261317	1	12.696678	0	6	4.46948191	2.51835948
298	2016	1.25100771	0.76291808	1	13.780156	0	6	3.74067037	2.76235226
298	2015	0.02922088	1.15727703	1	14.010879	0	6	3.54154509	2.53725524
298	2014	0.1110493	1.27189871	1	14.331877	0	6	3.89112432	2.71915544
298	2013	0.04549904	0.75496074	1	14.21704	0	6	4.1313524	2.74507042
298	2012	0.19342963	0.76130991	1	14.14407	0	6	4.3055584	2.69714644
299	2016	0.0122714	0.43294084	1	12.87016	0	6	4.02588441	2.24184766
299	2015	0.07732579	0.67657512	1	12.857617	0	6	3.97689842	2.14698628
299	2014	0.84103429	0.79230676	1	12.940798	0	6	4.06389176	2.24470637
299	2013	0.04726328	0.80357389	1	13.02657	0	6	4.26645657	2.4288367
299	2012	0.00463126	0.77796386	1	12.964379	0	6	4.37484744	2.41499166
300	2016	0.40718563	0.14459027	1	14.5831	0	6	4.1955326	3.01235647
300	2015	0.24067222	0.85355794	1	14.452124	0	6	3.77575159	2.44921859
300	2014	0.01141263	0.7378074	1	14.599937	0	6	3.8372817	2.36158562
300	2013	0.00271132	0.66600258	1	14.714632	0	6	4.13494541	2.47483022
300	2012	0.01478319	0.58223238	1	14.595414	0	6	4.24956423	2.29788155
301	2016	0.20872571	0.69258152	1	13.371138	0	6	3.96795072	2.52558455
301	2015	0.02580419	0.48036972	1	13.423674	0	6	3.89372357	2.53195752
301	2014	0	0.58144717	1	13.528124	0	6	3.94640474	2.19879268
301	2013	0	0.6153667	1	13.593798	0	6	4.21984006	2.47531286

301	2012	0.00027496	0.41026689	1	13.468291	0	6	4.39315817	2.62320528
302	2016	0.13343326	0.473538	1	13.500948	0	6	3.90083706	1.85252745
302	2015	0.05591141	0.56483074	1	13.449206	0	6	3.94977743	1.90335123
302	2014	0.35052024	0.5009989	1	13.371291	0	6	3.91108721	1.69687537
302	2013	0.00592939	0.36424373	1	13.409462	0	6	4.08391422	1.80464542
302	2012	0.0084621	0.58983623	1	13.279577	0	6	4.08861089	1.77924752
303	2016	0.18598816	0.1273258	1	13.163515	0	6	3.9601536	1.8795052
303	2015	0.13426775	0.66362671	1	13.175623	0	6	3.97120755	1.78816368
303	2014	0.03521655	1.03763861	1	13.249846	0	6	3.88649434	2.0360894
303	2013	0.17546057	0.97420033	1	13.503042	0	6	4.15262702	2.22358442
303	2012	0.00200798	0.7341154	1	13.421024	0	6	4.2760872	2.03374898
304	2016	0.01460976	0.44183882	1	13.210335	0	6	3.92655402	2.01971025
304	2015	0.04632713	0.46938656	1	13.265654	0	6	3.79285663	1.89402224
304	2014	0.01608396	0.67887532	1	13.370136	0	6	3.83920747	1.9550167
304	2013	0.36341597	0.75916944	1	13.38413	0	6	4.11276552	2.02500304
304	2012	0.01368986	0.67027714	1	13.245635	0	6	4.29254708	1.99228147
305	2016	0.21466693	0.50816368	1	14.493735	0	6	3.82272956	2.21661612
305	2015	0.07751737	0.70883449	1	14.549475	0	6	3.76458339	2.19717969
305	2014	0.52585866	0.86216438	1	14.641321	0	6	4.03070718	2.43435597
305	2013	0.11238806	0.81777077	1	14.49928	0	6	4.13670202	2.46560668
305	2012	0.30324632	0.68840093	1	14.373783	0	6	4.27242561	2.40312584
306	2016	0.03243815	0.54713885	1	14.831053	1	6	4.10739184	2.3696949
306	2015	0.08438435	0.63015573	1	14.85628	1	6	4.1028407	2.31879726
306	2014	0.04685401	0.73970008	1	14.915017	1	6	4.15162912	2.26881174
306	2013	0.27666309	0.64553605	1	14.967378	1	6	4.33127822	2.40158808
306	2012	0.35240394	0.4691564	1	14.891291	1	6	4.38063458	2.19518093

307	2016	0.71639729	0.45547738	1	13.403268	1	6	3.99898274	2.38699416
307	2015	0.75084045	0.72350518	1	13.379518	1	6	3.86656386	2.44938758
307	2014	0.08875236	0.67220594	1	13.520709	1	6	3.98250611	2.33208477
307	2013	0.23963403	0.40923134	1	13.517692	1	6	4.12494331	2.37482659
307	2012	0.17921841	0.45813409	1	13.619313	1	6	4.19946208	2.41011458
308	2016	0.042175	0.43728285	1	13.173423	1	6	4.10480936	2.14271019
308	2015	0.14395228	0.19585046	1	13.161641	1	6	4.08888532	1.95286108
308	2014	0.07470201	0.23723027	1	13.243115	1	6	4.11984647	1.98346973
308	2013	0.02635952	0.50149018	1	13.314001	1	6	4.36471243	2.16451324
308	2012	0.07341123	0.26737171	1	13.203908	1	6	4.44192891	1.65447934
309	2016	0.58332952	0.56166055	1	12.667894	0	7	4.13190358	2.00526876
309	2015	0.35481722	0.40490762	1	12.697758	0	7	4.0269011	1.91385645
309	2014	0.01586744	0.38730725	1	12.863058	0	7	4.06077775	1.91101668
309	2013	0.01136023	0.53043529	1	12.930912	0	7	4.28717711	2.02122791
309	2012	0.00829351	0.40043917	1	12.814962	0	7	4.38286571	1.74803326
310	2016	0.25630595	0.55901218	1	13.881439	0	6	3.96817483	2.55369418
310	2015	0.04075607	1.00246513	1	13.968796	0	6	3.86869431	2.5081386
310	2014	0.04938427	1.12158179	1	14.153525	0	6	3.98080769	2.47608325
310	2013	0.0030633	0.96151149	1	14.199084	0	6	4.27777158	2.70660956
310	2012	0.02363645	0.66833437	1	14.04878	0	6	4.44648352	2.69720655
311	2016	0.75864134	0.39238932	1	13.591366	0	6	4.08506967	2.6521157
311	2015	0.48150968	1.03923306	1	13.710012	0	6	3.83935745	2.61318215
311	2014	0.06818748	1.11650329	1	13.995532	0	6	3.93875253	2.48507797
311	2013	0.48820755	0.71707169	1	14.068366	0	6	4.18228189	2.56981871
311	2012	0.06569972	0.69420712	1	14.002153	0	6	4.36347299	2.58121535
312	2016	0.09636689	0.57024312	1	12.566869	0	6	4.11062705	2.32409058

312	2015	0	0.50822384	1	12.613159	0	6	3.97408924	2.11659775
312	2014	0	0.59495315	1	12.772138	0	6	3.98625302	2.10956269
312	2013	0.00436147	0.50604381	1	12.872754	0	6	4.18247001	2.16273987
312	2012	0	0.35832039	1	12.803129	0	6	4.3035641	2.13419993
313	2016	0.01845564	0.96145184	1	12.928958	0	6	4.01368477	2.61828631
313	2015	0.16050956	0.56967644	1	13.001097	0	6	3.97847362	2.55290589
313	2014	0.03036818	0.68654695	1	13.130772	0	6	4.09415494	2.64880198
313	2013	0.02635465	0.41847939	1	13.169455	0	6	4.3294722	2.84467401
313	2012	0.0317186	0.41700362	1	13.094982	0	6	4.45651966	2.76931035
314	2016	0.2419496	1.38248185	1	11.812619	0	6	3.8165254	2.50162897
314	2015	0.07009773	0.44824806	1	11.82844	0	6	4.23977232	2.56335894
314	2014	0.00640743	0.27526606	1	11.500242	0	6	3.81458011	2.05903014
314	2013	0.16312854	0.47469884	1	11.606243	0	6	4.05417543	2.1089018
314	2012	0	0.36238083	1	11.526155	0	6	4.22044963	2.07385434
315	2016	0.12734605	0.51586331	1	13.244875	0	6	4.21919549	2.6334102
315	2015	0.07891746	0.89179761	1	13.324036	0	6	4.04494043	2.49200937
315	2014	0.16434087	0.8636344	1	13.547254	0	6	4.03232486	2.37438618
315	2013	0.1566182	0.71085693	1	13.689153	0	6	4.2462351	2.49591319
315	2012	0.32734716	0.7102668	1	13.582349	0	6	4.40562898	2.43927711
316	2016	0	0.17813029	1	13.389961	0	6	3.88922211	2.69051746
316	2015	0.01227337	0.6622518	1	13.421289	0	6	3.85213526	2.70148751
316	2014	0.0406255	1.25812741	1	13.531037	0	6	3.90606183	2.68281246
316	2013	0.00203992	0.92460884	1	13.648237	0	6	4.17454753	2.77364398
316	2012	4.6999E-05	0.4715568	1	13.604137	0	6	4.29839215	2.65790264
317	2016	0.09631604	0.54566522	1	14.08699	0	6	4.41852446	2.78275784
317	2015	0.06750069	0.36983793	1	13.648999	0	6	3.93543648	2.26943485

317	2014	0.12613914	0.88714077	1	13.724066	0	6	3.99072863	2.29346554
317	2013	0.00230335	0.81996748	1	13.767867	0	6	4.2559237	2.2404039
317	2012	0.64048927	0.78111593	1	13.670532	0	6	4.37463782	2.1190653
318	2016	1.04708388	0.51237922	1	14.219716	0	6	3.67028818	2.37065861
318	2015	0.22881941	0.66815086	1	14.30964	0	6	3.54249305	2.30310576
318	2014	0.02454333	0.92531231	1	14.451289	0	6	3.77522895	2.49793162
318	2013	0.03471828	0.92953859	1	14.29463	0	6	3.96349511	2.68927314
318	2012	0.03856762	0.74286691	1	14.203758	0	6	4.09240962	2.4745156
319	2016	0.09496376	0.06563136	1	17.561217	1	6	4.03228581	0.98435229
319	2015	0.1469042	0.09790771	1	17.466797	1	6	3.97835794	1.09656987
319	2014	0.12048516	0.08503668	1	17.450728	1	6	3.74560725	1.01861372
319	2013	0.0819578	0.1179608	1	17.695098	1	6	3.77515164	1.13050493
319	2012	0.14855189	0.16740249	1	17.71105	1	6	3.94821548	1.26135764
320	2016	1.20779609	0.24942553	1	15.52929	1	4	3.81221385	2.48076308
320	2015	1.57177426	0.95545183	1	15.581309	1	4	3.88084616	2.85131932
320	2014	0.84206965	1.79619661	1	15.71616	1	4	3.88714159	3.04801694
320	2013	0.00181934	1.78902841	1	15.964291	1	4	4.11973581	3.39650258
320	2012	0.00106343	1.86205265	1	16.0765	1	4	4.1973318	3.37251025
321	2016	0.23047183	0.11659833	0	16.944611	1	7	4.43517088	1.50570252
321	2015	0.25162838	0.15091087	0	16.939943	1	7	4.37722633	1.52396041
321	2014	0.23717268	0.15811937	0	17.011992	1	7	4.37283096	1.56304376
321	2013	0.25788965	0.23053457	0	17.087945	1	6	4.60831016	1.76575219
321	2012	0.28699384	0.18232572	1	16.996081	1	6	4.47745642	1.66257993
322	2016	0.43229203	0.33891425	1	16.260246	1	6	4.24075874	0.98847669
322	2015	0.31122988	0.40639534	1	16.331534	1	7	4.24364529	1.07914435
322	2014	0.34221074	0.53752559	1	16.380505	1	7	4.45869575	1.27557395

322	2013	0.65817626	0.57503459	1	16.163113	1	6	4.28157378	1.40787604
322	2012	0.64511803	0.64653711	1	16.115062	1	6	4.19126071	1.54461626
323	2016	0.17714066	0.08244045	1	17.762824	0	6	4.20465447	0.38630675
323	2015	0.13961758	0.18030786	1	17.890021	0	7	4.29585613	0.47180887
323	2014	0.22579204	0.18491652	1	17.90986	0	7	4.33649236	0.62892914
323	2013	0.31320873	0.28131661	1	17.892152	0	6	4.09356349	0.59825941
323	2012	0.32463893	0.96291894	1	18.086581	0	6	4.10471091	0.56169192
324	2016	0.30670425	0.57286816	0	13.107923	0	7	4.42644627	1.49441262
324	2015	0.50302548	0.53100347	0	13.164722	0	7	4.30341323	1.38551806
324	2014	0.32034285	0.64537819	0	13.351155	0	7	4.3360642	1.2935174
324	2013	0.33876817	0.75014216	0	13.435867	0	6	4.49637877	1.38272475
324	2012	0.4615171	0.62951971	0	13.398666	0	6	4.43651649	1.28746635
325	2016	0.17994039	0.01757564	1	17.333584	1	6	4.04297051	1.10256015
325	2015	0.33366974	0.11580508	1	17.577107	1	7	3.92678239	1.27926106
325	2014	0.49047086	0.32090817	1	17.887258	1	7	4.03303347	1.83619365
325	2013	0.4621277	0.7355762	1	18.084431	1	6	4.17064322	2.09369079
325	2012	0.33314456	0.68733532	1	18.175123	1	6	4.26023798	2.16172163
326	2016	0.00609141	0.00618185	1	16.826926	1	7	1.15243453	0.01167557
326	2015	0.00478653	0.01696822	1	16.720011	1	7	1.10540252	0.01089345
326	2014	0.00398804	0.0017325	1	16.728814	1	7	0.90139108	0.01183963
326	2013	0.00407568	0.01192462	1	16.787563	1	7	0.95315637	0.01352414
326	2012	0.00698554	0.03893317	1	16.614501	1	7	1.05291489	0.01238005
327	2016	0.1311993	0.15150232	1	20.042891	1	7	3.68492841	0.81388762
327	2015	0.04269735	0.10509938	1	20.178455	1	7	3.5189088	0.76275999
327	2014	0.06903247	0.16824799	1	20.334441	1	7	3.54661925	1.06362118
327	2013	0.06164622	0.25939293	1	20.446231	1	7	3.60377941	1.26909797

327	2012	0.07623115	0.24912938	1	20.547922	1	7	3.6556769	1.36514733
328	2016	0.0358236	0.02949666	0	18.303156	1	7	3.86482934	0.94292838
328	2015	0.0104314	0.11429072	0	18.373028	1	7	3.80374432	0.85183327
328	2014	0.09877417	0.02309915	0	18.486271	1	7	3.80931355	0.77410439
328	2013	0.00753454	0.01559378	0	18.633637	1	7	3.79444327	0.72382962
328	2012	0.00393425	0.01026117	0	18.70565	1	7	3.71003589	0.58998924
329	2016	0.00343609	0.00364335	1	17.66803	0	6	4.39463569	0.2134891
329	2015	0.00461334	0.00575043	1	17.738555	0	7	4.50287963	0.33652724
329	2014	0.00635477	0.01795288	1	17.703634	0	7	4.51566067	0.50571278
329	2013	0.02025645	0.02411781	1	17.655555	0	6	4.54802959	0.67755526
329	2012	0.03090256	0.03923417	1	17.565051	0	6	4.53020485	0.78428229
330	2016	0.38674973	0.35057588	1	15.288029	0	6	4.18364575	1.98246027
330	2015	0.40563509	0.38199243	1	15.24201	0	6	4.10804102	2.00702621
330	2014	0.14481264	0.38746541	1	15.310427	0	6	4.35051588	2.13343564
330	2013	0.12313668	0.63894334	1	15.14136	0	6	4.15359839	1.96181373
330	2012	0.08498341	0.39485637	1	15.153362	0	6	4.27837921	1.69594179
331	2016	0.11701385	0.06912113	1	20.130187	1	7	3.21033514	0.67661375
331	2015	0.06086271	0.03084438	1	20.209094	1	7	2.94246609	0.46181709
331	2014	0.05524737	0.02478529	1	20.477359	1	7	2.94294718	0.48245886
331	2013	0.07119538	0.0372823	1	20.515984	1	6	2.61793671	0.41774342
331	2012	0.08198543	0.03707996	1	20.900943	1	6	2.66230953	0.45404128
332	2016	0.31872424	0.34827869	1	16.058721	0	6	4.34435515	2.35728964
332	2015	0.61343059	0.43276051	1	16.061504	0	6	4.27288628	2.38243483
332	2014	0.36721896	0.53212537	1	16.134369	0	6	4.26861359	2.33119354
332	2013	0.08988275	0.49115645	1	16.213435	0	6	4.35341496	2.24539116
332	2012	0.05000086	0.48417031	1	16.24622	0	6	4.38115204	2.1225324

333	2016	0.51253616	0.3483754	1	17.838338	0	6	4.29062604	2.34841488
333	2015	0.34743478	0.42885476	1	17.839611	0	6	4.15312554	2.28787523
333	2014	0.23946877	0.52249171	1	17.964664	0	6	4.19598623	2.12897048
333	2013	0.10645781	0.70195379	1	18.052214	0	6	4.35828164	2.11831328
333	2012	0.05233151	0.57227645	1	17.991058	0	6	4.29962137	1.93940892
334	2016	0.15639929	0.09343843	1	21.197443	1	7	3.12248804	0.7257557
334	2015	0.11302417	0.08778833	1	21.233056	1	7	2.96645906	0.64388078
334	2014	0.12372976	0.10958149	1	21.380402	1	7	2.94944841	0.66581812
334	2013	0.15229267	0.16126985	1	21.462625	1	6	3.01994775	0.73273898
334	2012	0.21579985	0.1599575	1	21.481281	1	6	2.97209771	0.7062549
335	2016	0.18734309	0.11411498	1	21.319932	1	7	3.80472254	0.94745679
335	2015	0.14534978	0.11005727	1	21.338207	1	7	3.6488433	0.86182103
335	2014	0.15805619	0.13263749	1	21.484124	1	7	3.63503016	0.88853138
335	2013	0.18529796	0.19595158	1	21.568398	1	6	3.75079997	0.97218059
335	2012	0.27552953	0.18892636	1	21.578864	1	6	3.68828388	0.93159935
336	2016	0.47299415	0.83360149	1	13.812383	1	5	3.90852925	2.19719124
336	2015	1.62961851	0.57381	1	13.899581	1	5	3.89880294	2.43321319
336	2014	0.79831003	1.80845138	1	14.01116	1	4	3.61797173	2.04799331
336	2013	1.72043871	1.41244469	1	14.289629	1	4	4.13865697	2.64060784
336	2012	0.30817123	1.51428754	1	14.220684	1	4	4.14909616	2.31199617
337	2016	0.71525059	0.86232144	1	15.961358	1	7	4.11215444	1.68302085
337	2015	1.0682304	0.98144644	1	16.02407	1	7	4.05364435	1.53301594
337	2014	0.93146581	1.12262923	1	16.174415	1	7	3.94624154	1.40098566
337	2013	0.96798714	1.07203728	1	16.455182	1	7	4.33445738	1.74622657
337	2012	0.70993743	0.81816002	1	16.315916	1	7	4.0742302	1.37119392
338	2016	0.03441399	0.08220836	1	18.710264	1	7	4.14623498	1.23822668

338	2015	0.01995948	0.13977412	1	18.801851	1	7	4.07520746	1.12982215
338	2014	0.08991017	0.06283864	1	18.95877	1	7	4.06649934	1.04684695
338	2013	0.01593732	0.14953748	1	19.133884	1	6	4.21768357	1.09226083
338	2012	0.01650504	0.08749793	1	19.188295	1	6	4.35195662	1.09723401
339	2016	0.10990856	0.0663681	1	19.464083	1	7	4.11934609	1.10402959
339	2015	0.09762477	0.06773248	1	19.437735	1	7	4.02052022	1.07353616
339	2014	0.11013878	0.05335592	1	19.51354	1	7	3.98564368	1.13334345
339	2013	0.10842741	0.13346039	1	19.587637	1	6	4.11807015	1.22850394
339	2012	0.13694668	0.11546123	1	19.555383	1	6	4.07313356	1.18275918
340	2016	0.89081291	0.37691542	0	13.436041	0	7	4.54978258	2.09584588
340	2015	0.98491153	0.75426062	0	13.404768	0	7	4.39066569	2.19365009
340	2014	0.68813162	0.6635716	0	13.517953	0	7	4.29443423	2.20116857
340	2013	0.73133226	1.19072646	0	13.660244	0	6	4.46904583	2.38277748
340	2012	1.89574464	1.19380489	0	13.555638	0	6	4.42634585	2.68182285
341	2016	0.46810934	1.73485202	0	13.303143	0	7	4.55792372	1.9435233
341	2015	0.34669481	1.59108981	0	13.309039	0	7	4.3714634	1.75677078
341	2014	0.45503211	1.56945119	0	13.486798	0	7	4.35703682	1.80104539
341	2013	0.76648314	1.63336867	0	13.576299	0	7	4.57773279	2.02952651
341	2012	0.9400182	1.58403579	0	13.46471	0	7	4.49637743	2.0993536
342	2016	0.19823099	0.12977397	1	20.281256	1	7	4.04241737	1.18941018
342	2015	0.1724951	0.12203177	1	20.247627	1	7	3.93490823	1.144475
342	2014	0.15519528	0.13136592	1	20.307976	1	7	3.92508828	1.18236043
342	2013	0.16651987	0.19545494	1	20.369796	1	6	4.06838539	1.30925888
342	2012	0.21658288	0.19710754	1	20.305749	1	6	4.0883151	1.30563432
343	2016	0.08326244	0.08744387	1	18.658958	0	7	3.73825173	0.87927316
343	2015	0.07594756	0.08753641	1	18.601991	0	7	3.67757882	0.86693661

343	2014	0.09367065	0.10595424	1	18.646218	0	7	3.66807726	0.90308674
343	2013	0.06850689	0.1549692	1	18.679903	0	6	3.8313817	0.98339558
343	2012	0.11560912	0.11663927	1	18.602442	0	6	3.86773946	0.99803587
344	2016	0.36919662	0.2490865	1	12.733516	0	6	3.97738732	2.05569097
344	2015	0.17464718	0.38795605	1	12.804982	0	6	3.77931267	1.8763754
344	2014	0.38391183	0.63778457	1	13.079254	0	6	3.78970438	1.91400041
344	2013	0.31359248	0.53731292	1	13.181288	0	6	3.99767234	2.13483817
344	2012	0.13951756	0.64049401	1	13.151687	0	6	4.09658372	2.12790106
345	2016	0.17996712	0.75029234	1	12.215691	0	6	3.9027951	2.61557498
345	2015	0.55332979	0.76535853	1	12.066296	0	6	3.68849491	2.55544495
345	2014	0.33998534	0.79392647	1	12.211859	0	6	3.67528811	2.48324093
345	2013	0.059683	0.81659901	1	12.301748	0	6	3.83089442	2.66060067
345	2012	0.07704437	0.76806957	1	12.196965	0	6	3.95593803	2.6245554
346	2016	0.09313053	0.2079958	1	13.953208	0	6	4.08612025	1.96948911
346	2015	0.07465654	0.77381108	1	14.014205	0	6	3.97996332	1.98039977
346	2014	0.07671471	0.51851221	1	14.102676	0	6	3.89224953	1.59427778
346	2013	0.0978787	0.55745918	1	14.246292	0	6	4.07725342	1.63674291
346	2012	0.03161009	0.78917347	1	14.159703	0	6	4.2012851	1.59820526
347	2016	0.199413	0.76970397	1	13.583431	1	6	3.63398896	2.18840132
347	2015	0.08958199	0.54366757	1	13.729745	1	6	3.69395092	2.36502163
347	2014	0.05934946	0.67763295	1	13.736556	1	6	3.83106637	2.41887172
347	2013	0.02647541	0.69916802	1	13.760666	1	6	4.13103051	2.98306888
347	2012	0.19379301	0.71462536	1	13.602763	1	6	4.16770842	2.76057971
348	2016	0.28762932	0.64790658	1	15.059303	0	6	4.0653178	2.2879626
348	2015	0.15546068	0.64945022	1	15.003029	0	6	3.92844085	2.13289771
348	2014	0.20361327	0.64622799	1	15.166349	0	6	3.9729261	2.02558444

348	2013	0.03561518	0.67412694	1	15.248889	0	6	4.25546521	2.0679375
348	2012	0.20047168	0.56160809	1	15.127104	0	6	4.37740407	2.00817256
349	2016	0.20603564	0.1867957	1	17.546244	0	6	4.13086566	1.53192492
349	2015	0.28558788	0.25834698	1	17.523643	0	6	4.10288925	1.5448196
349	2014	0.05009027	0.28234787	1	17.558969	0	6	4.12025127	1.5456445
349	2013	0.16543223	0.34277874	1	17.587906	0	6	4.23084652	1.66470212
349	2012	0.05697751	0.25486545	1	17.518535	0	6	4.22962092	1.5110497
350	2016	0.09803374	0.95915403	1	12.338054	1	6	3.64139838	2.45893658
350	2015	0.09752863	1.12038813	1	12.381954	1	6	3.64900508	2.53227612
350	2014	0.0606905	1.0166373	1	12.403266	1	6	3.66940865	2.36409111
350	2013	1.16743568	0.77730633	1	12.47892	1	6	4.02919698	2.87622477
350	2012	0.03344155	0.98165179	1	12.280755	1	6	4.11235501	2.8039198
351	2016	0.28812647	1.08424896	1	14.292685	0	7	4.49584912	3.16900438
351	2015	0.78172749	0.50712117	1	13.852342	0	7	3.93229401	2.29010747
351	2014	0.10352453	0.802124	1	14.071382	0	7	3.94845788	2.20301898
351	2013	0.02959084	0.85134637	1	14.22033	0	7	4.21499814	2.21365912
351	2012	0.04985055	0.58201001	1	14.141668	0	7	4.34583982	2.13943738
352	2016	0.0312719	0.0829201	1	15.156017	0	4	3.80528525	1.9129673
352	2015	0.01615973	0.23400752	1	15.111518	0	4	3.50373875	1.88431708
352	2014	0.03591719	0.37276766	1	15.224458	0	4	3.36623848	1.96877545
352	2013	0.8787957	0.42487877	1	15.366437	0	4	3.50974935	2.17816509
352	2012	0.61443509	0.52750573	1	15.319458	0	4	3.46476268	2.40315388
353	2016	0.05584144	0.11164691	0	13.042255	1	7	4.62641936	1.5697819
353	2015	0.0342101	0.03589114	0	12.898725	1	7	4.4801566	1.59514587
353	2014	0.03747978	0.07784121	0	12.889772	1	7	4.41541803	1.64066891
353	2013	0.06339631	0.06990845	0	12.954998	1	7	4.50935811	1.85614376

353	2012	0.10067033	0.32468374	0	12.855323	1	7	4.53640346	1.86902648
354	2016	0.32717486	0.46541562	1	14.231415	0	7	3.99957751	2.62744979
354	2015	0.26024047	0.68489422	1	14.250157	0	7	3.83162119	2.80359441
354	2014	0.19153729	0.7871242	1	14.382632	0	6	3.81827368	2.89413417
354	2013	0.44743908	1.60045307	1	14.553544	0	6	3.94454406	2.91292132
354	2012	0.38113963	1.2367834	1	14.711236	0	6	4.0046029	2.69887268
355	2016	0.0108341	0.00492883	1	20.017928	1	7	3.93635245	0.85504109
355	2015	0.02589482	0.00160771	1	19.993703	1	7	3.77026267	0.89943466
355	2014	0.02144148	0.09703778	1	20.150723	1	6	3.79903494	1.08954127
355	2013	0.05848209	0.15066404	1	20.206088	1	6	3.87854121	0.7583828
355	2012	0.04004826	0.31588024	1	20.238454	1	6	3.92480491	0.96956834
356	2016	0.08326152	0.09986615	1	17.988665	1	7	4.33193507	0.66218682
356	2015	0.16610833	0.04375944	1	18.038697	1	7	4.18587255	0.91989064
356	2014	0.18994575	0.21777477	1	18.231357	1	7	4.14949993	1.0737648
356	2013	0.13667632	0.24294147	1	18.448237	1	7	4.2431449	1.74012085
356	2012	0.27370738	0.77962712	1	18.491338	1	7	4.36309107	1.46410273
357	2016	0.00013199	0.16083401	1	18.322018	1	7	2.78992888	0.54457292
357	2015	0	0.0502938	1	18.582448	1	7	2.61619614	0.44047247
357	2014	0	0.00317994	1	18.738446	1	7	2.55715956	0.4594797
357	2013	0.00295363	0.02127801	1	18.89116	1	7	2.66213882	0.42920377
357	2012	0.00466112	0.13861433	1	18.958454	1	7	2.77026872	0.44972885
358	2016	0.10453207	0.17565774	1	14.434939	1	7	3.94200211	0.65523761
358	2015	0.10258637	0.22926001	1	14.540935	1	7	4.01933241	0.61016929
358	2014	0.55072611	0.27413852	1	14.635749	1	7	3.89355797	0.84186886
358	2013	0.02063953	0.1666223	1	14.687978	1	7	3.91269408	0.8482427
358	2012	0.02660006	0.02056606	1	14.686455	1	7	3.83143837	0.73407845

359	2016	0.21120295	0.93046894	0	14.584313	0	7	4.06293998	3.16609089
359	2015	0.37690993	0.84034661	0	14.612982	0	7	3.96569082	3.08669054
359	2014	0.4984204	1.14149616	0	14.781505	0	6	3.94928688	3.06469801
359	2013	0.34507371	1.40507416	0	14.979579	0	6	4.09022551	3.05653674
359	2012	0.41680391	1.41951466	0	15.086133	0	6	4.65332299	3.2541086
360	2016	0.078789	0.07701104	1	21.24003	1	7	3.2483634	0.36643803
360	2015	0.10970696	0.04524771	1	21.296296	1	7	3.18226703	0.35610538
360	2014	0.06378292	0.0598535	1	21.453004	1	7	3.17794574	0.41257974
360	2013	0.08631071	0.10117929	1	21.5218	1	7	3.05727506	0.42150839
360	2012	0.06090599	0.07827684	1	21.704666	1	7	3.02450995	0.3967452
361	2016	0	0.04979537	1	14.01316	0	6	4.32176161	3.58281794
361	2015	0	0.17564515	1	14.289276	0	6	4.315945	3.61240213
361	2014	0	0.0974615	1	14.570735	0	6	4.34598828	3.44663007
361	2013	0.30595191	0.85072342	1	14.772742	0	6	4.5034036	3.57513988
361	2012	0	0.40917024	1	14.820704	0	6	4.52115993	3.14149578
362	2016	0.4685338	0.40018184	1	17.032376	1	6	4.24523347	1.90033147
362	2015	0.6964248	0.4798568	1	17.086268	1	6	4.32660318	2.07441254
362	2014	0.55695167	0.51485031	1	17.140516	1	6	4.28110435	2.0611061
362	2013	0.56878222	0.56213319	1	17.312974	1	6	4.21419858	2.06533679
362	2012	0.39304361	0.67358865	1	17.502581	1	6	4.41723947	2.09152709
363	2016	0.00217264	0.00050187	0	15.522691	1	7	4.25292652	0.97082854
363	2015	0.00018598	0.19501564	0	15.550443	1	7	4.13583374	1.07586792
363	2014	0.00169656	0.28441625	0	15.673519	1	7	4.08808005	1.17718592
363	2013	0.00165463	0.21056558	0	15.807831	1	7	4.25646625	1.40123494
363	2012	0.00399999	0.28742754	0	15.744348	1	7	4.23883767	1.40310305
364	2016	0.03060195	0.15753694	1	18.20578	1	7	4.42819303	0.39548615

364	2015	0.02087754	0.16562121	1	18.196811	1	7	4.35157721	0.68709842
364	2014	0.02205206	0.15885758	1	18.28043	1	7	4.3409363	0.87029705
364	2013	0.01915928	0.18715486	1	18.367014	1	7	4.49272628	1.00376337
364	2012	0.02976946	0.19684557	1	18.309239	1	7	4.51966446	1.12081628
365	2016	0.04818808	0.02788945	1	19.224906	0	7	3.93539025	0.3703801
365	2015	0.03198595	0.02268963	1	19.335849	0	7	3.85945273	0.39212046
365	2014	0.00399899	0.02122221	1	19.515508	0	7	3.99963747	0.37841726
365	2013	0.1011594	0.05900637	1	19.537969	0	6	3.65705297	0.3414413
365	2012	0.01717565	0.02310599	1	19.96754	0	6	3.76102519	0.3148487
366	2016	0.0480232	0.02573402	1	19.228414	0	7	3.93418119	0.36974121
366	2015	0.03186197	0.05265602	1	19.339795	0	7	3.85865984	0.39135401
366	2014	0.00398405	0.00551278	1	19.519388	0	6	3.99697571	0.37765874
366	2013	0.09342932	0.05935888	1	19.543826	0	6	3.65735442	0.34147897
366	2012	0.01596586	0.0477563	1	19.971011	0	6	3.63628381	0.28261626
367	2016	0.79226465	0.1553297	1	16.555228	1	7	4.46095684	0.92991904
367	2015	0.84888346	0.17589847	1	16.484643	1	7	4.34412005	1.12444214
367	2014	0.98270562	0.17436499	1	16.504619	1	7	4.26264855	1.23539531
367	2013	0.90231675	0.22570427	1	16.623181	1	6	4.52006972	1.47019676
367	2012	0.99122119	0.31493263	1	16.466011	1	6	4.57127896	1.56955235
368	2016	0.01663979	0.06869549	0	16.910255	0	7	4.51868709	1.16493235
368	2015	0.06564541	0.0520648	0	16.89438	0	7	4.33911267	1.12725417
368	2014	0.02193173	0.10861312	0	17.064012	0	6	4.3967994	0.95144241
368	2013	0.02830851	0.0765554	0	17.116475	0	6	4.55424825	1.17718623
368	2012	0.05412448	0.05550282	0	17.085431	0	6	4.4983854	0.88181232
369	2016	0.18064682	0.19974636	0	14.09855	0	7	4.46577521	1.09274779
369	2015	0.20248523	0.07379585	0	14.141216	0	7	4.39863886	0.96198048

369	2014	0.08145187	0.0821273	0	14.280567	0	7	4.32388359	0.76521106
369	2013	0.08316951	0.10779375	0	14.47329	0	7	4.58744373	1.01552846
369	2012	0.11138931	0.00556847	0	14.336815	0	7	4.57012458	0.83175498
370	2016	0.00395716	0.00385257	0	15.724421	0	7	4.18332884	0.74550194
370	2015	0.00415735	0.12829734	0	15.744374	0	7	4.08321063	0.78761974
370	2014	0.01049177	0.02569991	0	15.832392	0	7	4.06418112	0.99323437
370	2013	0.00805448	0.2480063	0	15.897066	0	7	4.44136576	1.52854971
370	2012	0.01583988	0.35754367	0	15.613561	0	7	4.1597241	1.38065248
371	2016	0.01911121	0.86789681	1	17.19011	0	7	4.44125731	2.39435045
371	2015	0.00181735	0.41762751	1	17.181801	0	7	4.43209069	2.03100613
371	2014	0.03739019	0.21117866	1	17.207305	0	7	4.35572681	2.04339096
371	2013	0.031892	0.32385584	1	17.288099	0	7	4.41980639	1.97114505
371	2012	0.04128877	0.28309858	1	17.262575	0	7	4.52671995	0.85092243
372	2016	0.01044229	0.12655864	1	20.101523	0	7	3.74475049	0.72126708
372	2015	0.01131672	0.03457919	1	19.912597	0	7	3.36029094	0.66369674
372	2014	0.01502949	0.03655755	1	20.007661	0	7	3.34805888	0.72520771
372	2013	0.01855774	0.13092738	1	20.091218	0	7	3.44138548	0.80313278
372	2012	0.02584317	0.12188306	1	20.10208	0	7	3.45026183	0.73727459
373	2016	0.10610983	0.0130179	0	14.954972	1	7	3.15675167	0.03944665
373	2015	0.25299668	0.02390499	0	14.90084	1	7	3.05985716	0.04642547
373	2014	0.05256778	0.01322615	0	14.920633	1	7	2.95061074	0.08344553
373	2013	0.1398002	0.00501341	0	15.07393	1	6	2.93787946	0.10850277
373	2012	0.03442848	0.02373508	0	15.110149	1	6	2.24529459	0.08551417
374	2016	0.01856166	0.76790348	1	14.98287	0	7	3.95718672	2.66830027
374	2015	0.21092359	0.90931888	1	14.939972	0	7	3.86419796	2.56905706
374	2014	0.00254975	0.89647081	1	15.055094	0	7	3.95795918	2.59057002

374	2013	0.0609568	1.12568094	1	15.083653	0	7	4.19849894	2.72183167
374	2012	1.0251846	0.79993757	1	14.999067	0	7	4.38531957	2.74662904
375	2016	0.01212618	0.41232354	1	16.029446	1	4	4.14954592	2.16879767
375	2015	0.00854043	0.97308308	1	16.093671	1	4	4.10496106	2.42688834
375	2014	0.00515469	0.92715945	1	16.219702	1	4	4.12088848	2.61796261
375	2013	0.00259164	1.05163004	1	16.319251	1	4	4.30022446	2.82225814
375	2012	0.05039554	0.87579785	1	16.258357	1	4	4.30540204	2.65462516
376	2016	0.04294071	0.08552427	1	19.206827	1	7	4.16339435	1.44386397
376	2015	0.10404105	0.26580603	1	19.197528	1	7	4.0679683	1.6591762
376	2014	0.0701201	0.6416386	1	19.289094	1	7	3.98981805	1.75534511
376	2013	0.09558469	0.61192357	1	19.435848	1	7	4.08579448	1.94744083
376	2012	0.11834377	0.6736636	1	19.457841	1	7	4.11085378	1.92779157
377	2016	1.10505251	0.77392961	1	15.116961	1	5	4.27218151	2.85922835
377	2015	1.36852008	0.68057599	1	14.982902	1	5	4.06087138	2.73859609
377	2014	0.41858204	1.066749	1	15.154826	1	5	4.10117391	2.77935553
377	2013	0.42374108	0.91635833	1	15.204866	1	5	4.29057997	2.76966928
377	2012	0.10914584	1.05248877	1	15.150424	1	5	4.24312591	2.54835505
378	2016	1.36567218	0.68078053	1	18.064376	1	3	3.95917745	3.43800445
378	2015	0.56878448	1.42658782	1	18.198501	1	3	3.87887158	3.31839311
378	2014	0.2994377	1.27226527	1	18.333885	1	4	3.88788831	3.16616709
378	2013	0.36008413	1.37786544	1	18.488329	1	3	4.26925059	3.27359879
378	2012	0.14500556	1.16214656	1	18.307079	1	3	4.0656647	2.7462289
379	2016	0.2856465	0.16555596	1	15.203241	0	6	3.52681195	1.11232122
379	2015	0.22402237	0.1111719	1	15.175057	0	7	3.58521938	0.82601323
379	2014	1.48443689	0.12308893	1	15.223719	0	7	3.64490795	1.6454315
379	2013	0.0740754	0.27559709	1	15.385175	0	6	3.63361558	1.59382527

379	2012	1.10267702	0.7648914	1	15.550157	0	6	3.67657337	1.84190934
380	2016	0.37687632	0.57209531	1	11.955474	1	6	3.76688759	1.53535102
380	2015	0	0.47737266	1	11.990109	1	6	3.70039895	1.58187656
380	2014	0.10910011	0.9722517	1	11.829085	1	6	3.65468808	1.61477425
380	2013	0.38860511	1.27242945	1	11.793753	1	6	3.87567549	1.85805223
380	2012	0	0.91696091	1	11.284032	1	6	3.62616202	0.98753658
381	2016	0.13677749	0.5489338	1	13.38925	1	6	4.53962806	1.83358832
381	2015	0.24836051	0.75106178	1	13.298611	1	6	4.55825351	1.86126112
381	2014	0.03418884	0.38729231	1	13.316713	1	6	4.44413897	1.64950212
381	2013	0.07422768	0.53341554	1	13.43319	1	6	4.59417084	1.68854905
381	2012	0.05899694	0.19221908	1	13.397109	1	6	4.59769648	1.43165938
382	2016	0.48172405	0.35005035	0	14.069001	1	7	4.56823611	0.92548434
382	2015	0.26059115	0.33939653	0	14.052373	1	7	4.51743615	0.98463139
382	2014	0.23730441	0.49890506	0	14.071577	1	7	4.38977372	1.06327039
382	2013	0.27271284	0.56243581	0	14.155768	1	7	4.47027211	1.23351753
382	2012	0.38008986	0.52786915	0	14.11438	1	7	4.39620905	1.30067329
383	2016	0	0.00669255	1	17.41413	1	6	3.50366444	0.0649878
383	2015	0	0.00675911	1	17.262223	1	6	4.12479355	0.13315057
383	2014	0	0.00204591	1	16.59139	1	6	3.69929918	0.10968187
383	2013	0.00064579	0.00352677	1	16.621262	1	6	3.77180448	0.12832637
383	2012	0.01401434	0.02841446	1	16.561266	1	6	3.75701467	0.18030452
384	2016	0.09623157	0.03509104	0	15.531099	0	7	4.47635574	1.19619504
384	2015	0.14109062	0.11725756	0	15.639765	0	7	4.42915678	1.11843028
384	2014	0.32071227	0.01200465	0	15.758528	0	7	4.41096051	1.11353243
384	2013	0.15031992	0.09453988	0	15.908966	0	6	4.55100147	1.16405759
384	2012	0.02910919	0.0394976	0	15.935877	0	6	4.53372154	1.11332453

385	2016	1.58241424	0.99144162	1	15.404515	1	5	4.02134148	2.80923419
385	2015	0.48273474	1.47016205	1	15.417645	1	5	3.99162382	2.73867045
385	2014	0.79551106	1.38913482	1	15.518186	1	5	4.08425098	2.14477623
385	2013	0.00544216	0.71420735	1	15.637806	1	5	4.50295499	2.40129848
385	2012	0.05172775	0.47359156	1	15.37413	1	5	4.32971862	2.39366643
386	2016	1.19615513	0.45561879	0	15.568479	0	7	4.25732323	2.31463154
386	2015	0.88689694	0.49303938	0	15.673753	0	7	4.13355294	2.3516356
386	2014	0.73411156	0.56842657	0	15.79562	0	7	4.07050453	2.42134605
386	2013	0.71490623	0.98809442	0	15.952469	0	6	4.46325503	2.77965203
386	2012	1.03242975	0.88020625	0	15.721355	0	6	4.502885	2.85239565
387	2016	0.10393921	0.46400631	1	13.662843	0	6	4.15206881	1.5804922
387	2015	0.1395941	0.48379558	1	13.635787	0	6	4.04521871	1.48995751
387	2014	0.04712592	0.29234568	1	13.759496	0	6	4.01512544	1.44473542
387	2013	0.50393937	0.42499973	1	13.840987	0	6	4.2107134	1.74740816
387	2012	0.06375384	0.47543013	1	13.753922	0	6	4.41376355	1.8664307
388	2016	0.09246249	0.31357275	1	13.701022	1	7	3.90392912	1.9594395
388	2015	0.04100662	0.55403912	1	13.652428	1	7	3.85332044	2.04389415
388	2014	0.02546597	0.46590022	1	13.737201	1	6	3.84540865	2.22731873
388	2013	0.05301836	1.09090365	1	13.800386	1	6	4.52957434	2.74803229
388	2012	0.07697956	0.84296319	1	13.264348	1	6	4.12060482	2.57874423
389	2016	0.00681572	0.03947933	0	12.256873	0	7	4.15907538	1.59865721
389	2015	0	0.10982703	0	12.252051	0	7	4.07540422	1.66174303
389	2014	0	0.29903736	0	12.303169	0	7	4.07832092	1.73659325
389	2013	0	0.23829538	0	12.483803	0	7	4.15107335	1.8499919
389	2012	0	0.35033288	0	12.435775	0	7	4.22535908	1.94583515
390	2016	0.14382758	0.75183393	1	15.637259	0	6	4.22027791	2.23158167

390	2015	0.17504683	0.78571542	1	15.597667	0	6	4.1420556	2.15563666
390	2014	0.20122754	0.926639	1	15.562626	0	6	4.40105459	2.03427641
390	2013	0.46606338	1.00545077	1	15.306165	0	6	4.47154637	2.29105012
390	2012	0.10674995	0.09711854	1	14.96258	0	6	2.4683711	0.40756025
391	2016	0.21033143	0.6390964	1	16.57744	0	6	4.13548977	2.35405205
391	2015	0.09849873	0.44818163	1	16.713496	0	6	4.17891606	2.28429698
391	2014	0.7047506	0.66322546	1	16.792342	0	6	4.19745578	2.29462832
391	2013	0.11464122	0.72775728	1	16.865789	0	6	4.44184444	2.54493886
391	2012	0.05195657	1.08491795	1	16.758285	0	6	4.52258641	2.63122625
392	2016	0.01557705	0.16682206	0	14.99315	0	7	3.94848316	0.48579577
392	2015	0.00987013	0.17277446	0	14.974981	0	7	3.87129047	0.52591126
392	2014	0.01005924	0.20693205	0	14.981466	0	7	3.8301485	0.4946871
392	2013	0.01152137	0.26950028	0	15.037706	0	7	4.02875158	0.58396437
392	2012	0.01204813	0.53666178	0	14.915381	0	7	4.016202	0.72150137
393	2016	0.01031264	0.00032395	0	15.487392	0	7	4.1995715	0.93950283
393	2015	0.02173703	0.27411647	0	15.465962	0	7	4.12070151	1.03399981
393	2014	0.01439785	0.00689219	0	15.549024	0	7	4.04997137	1.03383623
393	2013	0.01904646	0.1705492	0	15.645168	0	7	4.18291415	1.35873276
393	2012	0.01833488	0.00026896	0	15.587131	0	7	4.23197259	1.44830391
394	2016	0.20520848	0.05199075	1	19.864137	1	6	4.21118048	0.88494866
394	2015	0.25084821	0.05310181	1	20.025953	1	7	4.23508875	0.92475997
394	2014	0.63334728	0.07668693	1	20.195019	1	7	3.85374981	0.98241699
394	2013	0.81136079	0.36086794	1	20.638157	1	6	3.94843767	1.702841
394	2012	0.85356561	0.5676055	1	20.638323	1	6	4.04858318	2.03352207
395	2016	1.22086915	0.95547106	1	15.819465	1	5	3.67117146	3.5077157
395	2015	1.13168078	0.78700676	1	15.90162	1	5	3.63032955	3.43488187

395	2014	0.90481271	1.58676645	1	16.031269	1	4	3.8159283	3.51649024
395	2013	0.06979468	1.5497775	1	15.990728	1	4	3.77382033	2.9954952
395	2012	0.07647111	1.09851628	1	16.262393	1	5	4.08500574	2.77379793
396	2016	1.57006944	1.89219422	1	16.556305	1	7	4.60443324	2.02477361
396	2015	1.86230802	2.32633463	1	16.16807	1	7	4.32227989	2.24661266
396	2014	2.57207995	2.44688126	1	15.960637	1	7	3.88825608	2.27803171
396	2013	2.37507188	2.64923988	1	16.368392	1	7	4.38850101	2.50775854
396	2012	1.94970095	2.51613307	1	16.336193	1	7	5.05319355	2.63404823
397	2016	0.03864843	0.21497024	0	13.657229	1	7	4.55381722	0.57946043
397	2015	0.02244814	0.20150635	0	13.604775	1	7	4.64295977	0.63994259
397	2014	0.04661828	0.11497554	0	13.464212	1	7	4.253142	0.65944199
397	2013	0.04162359	0.24643733	0	13.703008	1	7	4.50002611	0.88082147
397	2012	0.09068039	0.24625599	0	13.692929	1	7	4.34724703	1.06044579
398	2016	0.79797555	0.68800347	1	14.828346	0	4	4.15196254	2.5035425
398	2015	1.09578463	0.62173818	1	14.761926	0	4	3.98583103	2.87650066
398	2014	0.18955285	1.54280247	1	14.840814	0	4	3.92369925	2.78959664
398	2013	0.04451628	0.85307784	1	15.024935	0	4	4.26625675	2.95611773
398	2012	0.16423566	0.61323563	1	14.919107	0	4	4.19819404	2.89349249
399	2016	0.115553	0.0531862	1	20.728117	1	6	3.46903654	0.57471212
399	2015	0.09863465	0.05716264	1	20.799056	1	7	3.4589661	0.56463574
399	2014	0.09739346	0.07282937	1	20.941926	1	7	3.43521526	0.55907221
399	2013	0.13979933	0.13192873	1	21.013469	1	6	3.58432858	0.69818198
399	2012	0.16328399	0.13934968	1	20.975447	1	6	3.57924233	0.61001011
400	2016	0.00633092	0.00651374	0	14.650002	1	7	4.62449169	1.58310852
400	2015	0.00964038	0.00671143	0	14.63715	1	7	4.52749947	1.39850871
400	2014	0.02434816	0.00475965	0	14.721201	1	7	4.55121555	1.37932287

400	2013	0.02583537	0.11020685	0	14.77905	1	6	4.78486398	1.60445994
400	2012	0.11902848	0.04187392	0	14.598787	1	6	5.01588282	1.67156352
401	2016	0.12539929	0.13017176	1	21.588257	1	6	3.60428613	0.56329871
401	2015	0.1340264	0.12783281	1	21.60275	1	7	3.58628361	0.64326657
401	2014	0.14774478	0.1413242	1	21.691822	1	7	3.62405433	0.74096544
401	2013	0.21413994	0.20263141	1	21.705838	1	6	3.63360031	0.85684217
401	2012	0.22087298	0.27710205	1	21.71375	1	6	3.65540747	0.92319008
402	2016	0.00762188	0.04635291	1	16.602049	0	7	4.19943479	0.80827737
402	2015	0.00564901	0.00657136	1	16.66654	0	7	4.18211063	1.18336726
402	2014	0.00147391	0.04077239	1	16.777527	0	7	4.24390827	1.2096428
402	2013	0.00259862	0.03307301	1	16.79087	0	7	4.3135268	0.97517077
402	2012	0.00766455	0.15102953	1	16.791475	0	7	4.41705555	0.67174018
403	2016	0.01394334	0.03843387	1	15.583528	1	6	3.79395313	0.61193224
403	2015	0.00490197	0.03077748	1	15.541844	1	6	3.68915699	0.55612915
403	2014	0.005651	0.05023674	1	15.550181	1	6	3.91731934	0.73387877
403	2013	0.00358656	0.09024099	1	15.198619	1	6	4.28143087	1.02352266
403	2012	0.02748967	0.23053298	1	14.688863	1	6	4.89121742	1.58322062
404	2016	0.68489119	1.83296219	0	13.244664	1	7	4.50162332	1.12687025
404	2015	0.04951371	1.58565165	0	13.251629	1	7	4.46112917	1.08381265
404	2014	0.82586699	1.66013787	0	13.267311	1	7	4.29595155	1.13344068
404	2013	0.62977545	2.1180729	0	13.494092	1	6	4.50861654	1.74908437
404	2012	0.12517344	2.12686732	0	13.41839	1	6	4.20102637	2.0784513
405	2016	0.3204481	0.28327186	1	14.334863	1	8	3.99671988	0.23387932
405	2015	0.2258814	0.75193294	1	14.342514	1	8	4.03948529	0.23241484
405	2014	0.13157373	0.06615846	0	14.317414	1	8	4.06014847	1.49409462
405	2013	0.09703324	0.04347703	0	14.453395	1	7	4.25350836	0.33085506

405	2012	0.45895848	0.32878779	0	14.39429	1	7	4.33891541	0.43997217
406	2016	0.15242405	0.24834101	1	17.715251	0	6	3.33874522	1.80950475
406	2015	0.03699902	0.37434726	1	17.786264	0	6	3.21926715	1.67029968
406	2014	0.06231449	0.25496775	1	17.913956	0	6	3.08989234	1.56003735
406	2013	0.09189618	0.38467992	1	17.970094	0	6	3.38635897	1.85222376
406	2012	0.19275444	0.44084062	1	17.782697	0	6	3.79275884	2.09034501
407	2016	0.42925976	0.65137943	1	16.253508	0	6	4.1048739	2.7530866
407	2015	0.08926741	0.79671905	1	16.456801	0	6	3.81725088	2.43025544
407	2014	0.08714328	0.56205111	1	16.794795	0	6	3.91268379	2.32213416
407	2013	0.24053307	0.85292528	1	16.84096	0	6	4.2846204	2.71821536
407	2012	0.49927902	0.80043264	1	16.619298	0	6	4.49679785	2.75310629
408	2016	0.36916413	0.17607962	1	13.822945	1	6	3.46329496	0.68756513
408	2015	0.00192614	0.23924758	1	13.742542	1	6	3.40100813	0.73867345
408	2014	0.00182134	0.2397914	1	13.636476	1	6	3.61164829	0.8585133
408	2013	0.3512032	0.55962665	1	13.287982	1	6	3.80743575	1.47247252
408	2012	0.02438134	0.79514224	1	12.905001	1	6	4.38586807	1.60789492
409	2016	0.01995066	0.31124453	1	12.380309	1	6	3.7463175	1.71233325
409	2015	0.10730163	0.36339025	1	12.3371	1	6	3.85336434	1.94834689
409	2014	0.10913688	0.48428553	1	12.123242	1	6	3.60015539	1.36989538
409	2013	0.02748481	0.46071941	1	12.404856	1	6	3.89615225	1.43287972
409	2012	0	0.51640344	1	11.985941	1	6	4.22145779	1.08321198
410	2016	0.18706695	0.22824173	1	17.151615	1	6	4.18589149	1.02253618
410	2015	0.26737859	0.18385621	1	17.144619	1	6	4.19401097	1.11258127
410	2014	0.32078483	0.23194867	1	17.164469	1	6	4.11810023	1.21061092
410	2013	0.09826399	0.30951572	1	17.175944	1	6	4.24397813	1.39706861
410	2012	0.2362714	0.44129354	1	17.044361	1	6	4.36258866	1.35774981

411	2016	0.00036193	0.32770607	0	14.097554	1	7	4.31334837	1.54928273
411	2015	0.0090202	0.48921233	0	14.140794	1	7	4.3367377	1.49125915
411	2014	0.05096399	0.63718775	0	14.224617	1	7	4.35110556	1.46121884
411	2013	0.00620869	1.0523418	0	14.343806	1	7	4.55161645	1.70720997
411	2012	0.00144795	0.4630451	0	14.296468	1	7	4.38293046	1.30601961
412	2016	0.63090948	0.35980016	1	20.454507	1	6	3.97392899	2.23628203
412	2015	0.56623214	0.32325238	1	20.417528	1	6	3.89551701	2.28156276
412	2014	0.33918926	0.45527824	1	20.480974	1	6	3.88501172	2.24528559
412	2013	0.18491984	0.705013	1	20.576744	1	6	3.99615069	2.25272792
412	2012	0.2200604	0.52308635	1	20.605134	1	6	4.11219348	2.12274466
413	2016	3.3999E-05	0.00685942	1	16.692622	1	6	3.03751633	0.03150739
413	2015	0	0.00621763	1	16.511219	1	6	3.04357551	0.0316411
413	2014	0	0.01042942	1	16.54959	1	6	2.78014566	0.02984614
413	2013	0	0.00691702	1	16.698598	1	6	3.19283098	0.05475046
413	2012	0.00031195	0.00495869	1	16.133252	1	6	3.47721628	0.06949714
414	2016	0.00613614	0.02439989	1	16.785211	1	7	4.05109389	0.11952019
414	2015	0.0320828	0.05335212	1	16.876019	1	7	3.99402821	0.18322198
414	2014	0.00987607	0.03107125	1	17.043558	1	7	4.06028276	0.22783891
414	2013	0.00807035	0.00307128	1	17.164308	1	7	4.29603669	0.39338106
414	2012	0.03278563	0.00803265	1	17.107497	1	7	4.27040611	0.33844458
415	2016	0.00358556	0.01268718	0	16.812787	0	7	4.02001842	0.52774351
415	2015	0.00208882	0.85527113	0	16.819657	0	7	3.94928711	0.50648682
415	2014	0.00292871	0.23735647	0	16.918791	0	7	3.90695486	0.59736949
415	2013	0.00097652	0.30652836	0	17.029026	0	7	4.02019436	0.74200829
415	2012	0.00348293	0.28270747	0	16.981716	0	7	3.99559684	0.73586657
416	2016	0.05322982	0.08938082	1	15.024509	1	6	2.99715811	0.72661919

416	2015	0.02318123	0.35504301	1	15.092596	1	6	4.59203934	1.74960534
416	2014	0.19264228	0.12542664	1	13.645533	1	6	4.17826677	1.64343327
416	2013	0.02472286	0.11669355	1	13.735911	1	6	4.19436132	1.64762906
416	2012	0.0415104	0.08243953	1	13.819792	1	6	4.36197546	1.69531556
417	2016	0.27781884	0.49751969	1	15.462602	1	6	3.82993562	1.78666669
417	2015	0.02103618	0.40715501	1	15.646163	1	6	3.91529951	1.49144573
417	2014	0.09377081	0.20249666	1	15.583614	1	6	3.96777376	1.35072729
417	2013	0.3193268	0.44340423	1	15.527725	1	6	4.02262972	1.61208999
417	2012	0.14404839	0.53096937	1	15.350067	1	6	4.09340218	1.87451388
418	2016	1.66225519	0.41228513	1	12.271697	1	4	3.88478132	2.62208446
418	2015	0.15515675	1.26454698	1	12.371061	1	4	4.08229305	2.31161738
418	2014	1.21853555	0.27118906	1	12.271681	1	4	3.87733191	3.01253629
418	2013	0.1297564	1.86491498	1	12.298798	1	4	4.07593365	3.15688837
418	2012	0.09149473	0.70784366	1	12.256229	1	4	4.10131452	3.02261385
419	2016	0.05975836	0.03519435	1	18.236605	0	7	4.25209809	0.97391641
419	2015	0.07763766	0.2045795	1	18.19203	0	7	4.08899218	1.13011838
419	2014	0.10214856	0.618714	1	18.298393	0	6	4.74930939	1.74114577
419	2013	0.17537415	0.38142307	1	17.695122	0	6	3.82832224	1.42314857
419	2012	0.18736797	0.52551816	1	17.636162	0	6	3.708853	1.24318496
420	2016	0.29913153	0.1651559	1	16.079496	1	4	3.81912667	1.48107576
420	2015	0.47467582	0.33553823	1	16.014085	1	4	3.76043838	1.70063766
420	2014	0.52974492	0.36564192	1	16.059096	1	4	3.68673177	2.05272481
420	2013	0.38213302	0.64057939	1	16.289223	1	4	3.88639783	2.3488622
420	2012	0.49101447	0.3804153	1	16.226473	1	4	3.8312584	2.08681392
421	2016	1.3207783	0.89793	1	12.606348	0	4	3.9815909	2.74699748
421	2015	0.60441378	0.67055284	1	12.572677	0	4	4.01823842	2.8362631

421	2014	1.59509372	0.16514742	1	12.517077	0	4	4.05002073	3.16390927
421	2013	0.35461312	0.97952315	1	12.543928	0	4	3.68574269	3.26382181
421	2012	0.27084283	0.00628819	1	12.648062	0	4	3.69570337	3.0963951
422	2016	0.06385422	0.50976746	1	12.601628	1	6	4.30811465	1.94376514
422	2015	0.14900862	0.31670602	1	12.174445	1	7	4.06687461	2.05090793
422	2014	0.08869471	0.68357552	1	12.135037	1	7	4.10363284	2.33441229
422	2013	0.09412038	1.2688846	1	11.978748	1	6	4.38007591	2.71380455
422	2012	0.10453117	1.31390591	1	11.567902	1	6	3.92459925	2.72215341
423	2016	0.01160144	0.02865257	1	20.096734	1	7	3.29511976	0.17556713
423	2015	0.01490339	0.0087625	1	20.121031	1	7	3.21808163	0.20036856
423	2014	0.01329621	0.02672761	1	20.202024	1	7	3.13318878	0.17378775
423	2013	0.01354683	0.06160109	1	20.278452	1	7	3.16991606	0.23473214
423	2012	0.01520679	0.03144246	1	20.330274	1	7	3.19129581	0.28295467
424	2016	0.28472395	0.18244322	1	17.39874	0	6	4.15358187	1.233475
424	2015	0.20419394	0.11748966	1	17.396668	0	6	3.95204215	1.17506765
424	2014	0.37657374	0.12059596	1	17.547149	0	6	3.92548447	1.30811847
424	2013	0.16028894	0.19191621	1	17.586642	0	6	4.06960208	1.47021492
424	2012	0.1550754	0.22787156	1	17.536201	0	6	4.15162441	1.55647691
425	2016	0.49609648	0.60733327	1	13.112923	1	4	3.94085245	1.19332744
425	2015	0.01509352	0.38148999	1	13.114834	1	4	3.59309458	0.86662012
425	2014	0.00166761	0.6987599	1	13.425327	1	4	3.74624113	0.83355935
425	2013	0.00090259	0.3828602	1	13.512079	1	4	4.03274081	0.80200472
425	2012	0.00324971	0.31288919	1	13.234285	1	4	4.23724128	0.82498652
426	2016	0.01118521	0.10623663	0	15.918242	0	7	4.30478795	0.62133695
426	2015	0.01065602	0.15139661	0	15.923967	0	7	4.20489854	0.80307366
426	2014	0.00985528	0.07960107	0	16.00444	0	7	4.16257313	0.86980523

426	2013	0.01098148	0.04242519	0	16.107573	0	7	4.33904981	1.05858061
426	2012	0.01334555	0.09376171	0	16.023204	0	7	4.30458581	1.42936606
427	2016	0.02919174	0.15658999	0	15.580641	0	7	4.28119047	1.04299281
427	2015	0.01526687	0.08729542	0	15.55133	0	7	4.14464891	1.14639909
427	2014	0.0061749	0.08272219	0	15.629455	0	7	4.10294173	1.23170392
427	2013	0.01240573	1.04622541	0	15.733637	0	7	4.27775743	1.69626512
427	2012	0.01190189	0.06102831	0	15.663413	0	7	4.21944244	1.72823324
428	2016	0.05011405	0.07790226	1	19.304438	1	7	3.57011022	0.3859642
428	2015	0.04733864	0.08668491	1	19.288232	1	7	3.42437337	0.33845099
428	2014	0.06125877	0.10163649	1	19.370049	1	7	3.39788259	0.28719645
428	2013	0.07730543	0.07944314	1	19.442119	1	6	3.47892412	0.27666233
428	2012	0.05710313	0.13627936	1	19.369714	1	6	3.34423563	0.18631939
429	2016	0.41184538	0.644545	0	15.566034	1	7	4.48607775	2.04809612
429	2015	0.31106138	0.66909626	0	15.55342	1	7	4.41367896	1.91506766
429	2014	0.23799197	0.66444931	0	15.583183	1	7	4.53796811	1.67310224
429	2013	0.14581835	0.77429113	0	15.456299	1	6	4.71882169	1.68601425
429	2012	0.172639	0.62065713	0	15.228612	1	6	4.74869358	1.46722529
430	2016	0.25418165	0.16900833	0	14.692066	0	7	4.29223618	0.65545518
430	2015	0.16632089	0.05377865	0	14.635767	0	7	4.27077325	0.77383691
430	2014	0.26099101	0.27171884	0	14.620568	0	7	4.13842559	0.81625468
430	2013	0.27300666	0.24776592	0	14.656489	0	6	4.37530311	1.14060608
430	2012	0.306613	0.31810312	0	14.479396	0	6	4.40985767	1.07215469
431	2016	0.03525324	0.21646047	1	15.90057	0	7	4.22374986	1.81702736
431	2015	0.09691525	0.25210645	1	15.915639	0	7	4.06835366	1.91922936
431	2014	0.01676075	0.4261288	1	16.120325	0	7	3.99041273	2.05250679
431	2013	0.00886063	0.25773588	1	16.323239	0	7	4.09063877	2.17298801

431	2012	0.00442221	0.24516489	1	16.388208	0	7	4.04329985	2.14040587
432	2016	0.01114566	0.02088146	1	19.363807	1	7	3.72784396	0.40781169
432	2015	0.03256302	0.01835256	1	19.35588	1	7	3.51018962	0.49830375
432	2014	0.03539996	0.0327924	1	19.594017	1	7	3.5038265	0.599864
432	2013	0.0306194	0.09311322	1	19.752425	1	7	3.50193288	0.726211
432	2012	0.03000239	0.05994109	1	19.910769	1	7	3.43254307	0.91017849
433	2016	0.00275121	0.08301766	1	18.975136	1	7	3.96810142	0.49824542
433	2015	0.00336633	0.11190177	1	19.049477	1	7	3.85158064	0.60694584
433	2014	0.01782518	0.03874464	1	19.199628	1	7	3.81759997	0.68520422
433	2013	0.00443415	0.11855607	1	19.320275	1	7	3.874457	0.89827665
433	2012	0.02639555	0.13801781	1	19.387504	1	7	4.03840657	0.9521454
434	2016	0.01171313	0.09765742	0	16.030509	0	7	4.41667033	0.93947
434	2015	0.01018694	0.16513386	0	16.041789	0	7	4.31281482	0.97909462
434	2014	0.00954827	0.07787821	0	16.13914	0	7	4.27151948	0.96968021
434	2013	0.018914	0.13775733	0	16.253095	0	7	4.47223751	1.35513259
434	2012	0.01150951	0.00708484	0	16.187819	0	7	4.4129664	1.3018282
435	2016	0.03371907	0.00916091	0	17.655811	1	8	4.02364372	0.05649753
435	2015	0.03217189	0.00154381	0	17.634624	1	8	3.97042328	0.06021136
435	2014	0.0281831	0.00180038	0	17.644291	1	8	3.85413098	0.07818159
435	2013	0.02692135	0.04291005	0	17.731759	1	7	4.04955071	0.12817419
435	2012	0.04756561	0.05511678	0	17.616319	1	7	4.54718509	0.17021524
436	2016	0.05108562	0.01385162	1	17.231622	1	8	4.44383571	0.08535809
436	2015	0.04890254	0.00240511	1	17.208203	1	8	4.39109756	0.09091691
436	2014	0.04303746	0.00283597	1	17.217062	1	8	4.2597537	0.11589592
436	2013	0.04055444	0.06289592	1	17.318945	1	8	4.43320662	0.18402095
436	2012	0.06924151	0.05529373	1	17.227028	1	7	4.54718443	0.1701621

437	2016	0.00064179	0.00267941	0	16.85435	1	8	4.55852712	0
437	2015	0.00039092	0.00604072	0	16.798165	1	8	4.52094561	0
437	2014	0.00086563	0.00645413	0	16.768406	1	8	4.34802691	0.00018198
437	2013	0.00181335	0.00523527	0	16.877005	1	7	4.50189037	0.00483927
437	2012	0.00649983	0.00207185	0	16.789709	1	7	4.52700986	0.0027921
438	2016	0.2378146	0.0996245	1	18.841546	1	7	4.29885336	0.97799374
438	2015	0.1385795	0.10868668	1	18.818942	1	7	4.15504626	0.94169451
438	2014	0.25284526	0.14241494	1	18.932847	1	7	4.20391479	1.03001862
438	2013	0.20460802	0.24001404	1	18.935744	1	7	4.31018037	1.13188425
438	2012	0.24908105	0.25642435	1	18.93202	1	6	4.33532522	1.11386504
439	2016	0.03522524	0.00551675	1	16.790873	0	6	4.42887942	0.73202312
439	2015	0.05384025	0.13522121	1	16.812014	0	7	4.51471482	0.95601247
439	2014	0.08618228	0.28850723	1	16.75649	0	7	4.47592457	1.11867338
439	2013	0.39322652	0.39512921	1	16.72974	0	6	4.53886411	1.38769039
439	2012	0.43651018	0.36027944	1	16.605355	0	6	4.46201831	1.49619441
440	2016	0.13552341	0.0035467	0	15.466569	0	7	4.36791828	1.49781785
440	2015	0.14388214	0.07981345	0	15.57598	0	7	4.19691323	1.59033664
440	2014	0.25341511	0.06246951	0	15.70756	0	7	4.18484122	1.81569017
440	2013	0.17182331	0.10610983	0	15.850783	0	6	4.35325951	2.06234472
440	2012	0.09250169	0.12750452	0	15.85653	0	6	4.36964073	1.88050741
441	2016	0.18076869	0.05830947	1	20.745229	1	6	3.82709529	0.62143794
441	2015	0.19400965	0.04740254	1	20.916296	1	7	3.92942711	0.71826263
441	2014	0.3788966	0.07811963	1	21.025111	1	7	3.98513037	0.94844965
441	2013	0.53709962	0.26362193	1	21.068195	1	6	4.01738522	1.51969262
441	2012	0.52443381	0.42476499	1	21.120517	1	6	4.01334141	1.75453153
442	2016	0.18342095	0.05913834	1	20.729297	1	6	3.85594386	0.62818617

442	2015	0.196586	0.04802797	1	20.901773	1	7	3.93001776	0.72516267
442	2014	0.38314929	0.07945423	1	21.011689	1	7	3.99315843	0.95928125
442	2013	0.54445922	0.26818422	1	21.050576	1	6	4.03120741	1.5349889
442	2012	0.53807166	0.43109907	1	21.100978	1	6	4.00333091	1.76960213
443	2016	0.08455436	0.21426263	1	14.75088	1	6	4.65724976	1.4972535
443	2015	0.17814535	0.30794489	1	14.584758	1	6	4.6876209	1.37970419
443	2014	0.19831383	0.31926722	1	14.381416	1	6	4.57095874	1.46318271
443	2013	0.14722792	0.5573223	1	14.277858	1	6	4.47217155	1.73669521
443	2012	0.1117122	0.49584132	1	14.254875	1	6	4.61923643	1.67316698
444	2016	0.25258507	0.24528071	1	17.281291	1	6	4.13905838	1.49327639
444	2015	0.34529534	0.28070731	1	17.27068	1	6	4.09399754	1.51052104
444	2014	0.05707574	0.35791567	1	17.331257	1	6	4.08193404	1.61886415
444	2013	0.12312253	0.38641955	1	17.360012	1	6	4.19582548	1.69685851
444	2012	0.49568112	0.39069321	1	17.310631	1	6	4.29582661	1.61943002
445	2016	0.36375105	0.55813813	1	17.628636	1	6	4.51263983	2.60927551
445	2015	0.14065546	0.57211619	1	17.680658	1	6	4.37090039	2.49650323
445	2014	0.18161381	1.52348452	1	17.880422	1	6	5.63651143	4.06318968
445	2013	0.45945064	1.18940075	1	16.809151	1	6	4.64143735	2.90667098
445	2012	0.0690866	0.70032188	1	16.762725	1	6	4.58899726	2.63415634
446	2016	0.33847594	0.32155582	1	14.242955	1	6	4.44024018	2.77397358
446	2015	0.48728101	0.62662002	1	14.196058	1	6	4.10280218	2.56096126
446	2014	0.11587722	0.51575227	1	14.569688	1	6	4.06968097	2.41630013
446	2013	0.06841537	0.69729556	1	14.746723	1	6	4.31032867	2.55847328
446	2012	0.06452102	0.56666914	1	14.701392	1	6	4.47493609	2.6487623
447	2016	0.01644602	0.3695194	0	14.035746	1	7	4.15198941	1.96174103
447	2015	0.01267631	0.81679609	0	13.901009	1	7	4.07677534	2.12825313

447	2014	0.06847794	0.78244843	0	13.910631	1	7	4.20556194	2.24619123
447	2013	0.06781845	1.05723771	0	13.839784	1	6	4.17456545	2.42898098
447	2012	0.06979748	1.0992744	0	13.906359	1	6	4.11812116	2.4133547
448	2016	1.0917753	0.93822638	0	13.31137	1	7	2.85045167	1.92588512
448	2015	0.98876096	1.18155816	0	13.436287	1	7	2.95427497	2.05755579
448	2014	1.2481891	1.94437998	0	13.516052	1	7	3.05089031	2.14647032
448	2013	1.97553955	2.04798441	0	13.759049	1	6	3.31476733	2.28314842
448	2012	2.08608344	1.76099695	0	13.923542	1	6	3.5181468	2.71621736
449	2016	0.54132961	1.14569751	1	17.510798	1	6	3.64155163	2.867776
449	2015	0.89374201	0.33932602	1	17.655539	1	6	3.11258719	2.88266648
449	2014	0.10482837	1.18036277	1	17.769097	1	6	3.16024664	2.75903605
449	2013	0.06115154	0.45068	1	17.905551	1	6	3.39799269	2.62435304
449	2012	0.10365346	0.50871099	1	17.94845	1	6	3.29538651	2.25963051
450	2016	0.853526	1.39442596	1	15.526333	1	6	4.42527644	3.81748999
450	2015	0.52328666	0.86245779	1	15.672629	1	6	4.3470334	3.66569396
450	2014	0.13612228	1.85402134	1	15.852799	1	6	4.28497222	3.42657301
450	2013	0.06175246	1.11845184	1	16.096398	1	6	4.52410429	3.31955129
450	2012	0.06551523	0.80757526	1	16.121618	1	6	4.60329752	3.16559918
451	2016	0.54305484	0.13932359	1	13.479084	1	5	3.34268136	2.04978266
451	2015	0.22739052	0.11781148	1	13.420658	1	5	3.2124282	1.94652881
451	2014	0.08063669	0.2009781	1	13.564874	1	5	3.20725986	2.01575492
451	2013	0.33444948	0.66736978	1	13.616442	1	5	3.50726171	2.24207301
451	2012	0.05751202	1.10156027	1	13.445117	1	5	3.61925688	2.59795412
452	2016	0.23130694	0.07235508	1	13.9048	1	6	2.4375782	1.87447522
452	2015	1.06334981	0.09437429	1	14.259099	1	7	2.20884667	1.75926779
452	2014	0.84304626	0.45902357	1	14.603477	1	7	2.91829049	1.84772715

452	2013	0.03045549	0.22100447	1	14.934907	1	6	3.17780359	1.9407276
452	2012	0.80182803	0.4003467	1	14.99917	1	6	3.24965384	2.0440541
453	2016	0.37416293	3.30911429	0	14.830656	1	7	4.49139525	1.26656979
453	2015	0.52543124	3.32033698	0	14.879711	1	7	4.39303428	1.22527813
453	2014	0.40000087	3.12293547	0	15.009237	1	7	4.37443048	1.22619045
453	2013	0.22105738	3.1890565	0	15.223563	1	6	4.62075599	1.32720948
453	2012	0.08923998	3.03648935	0	15.160183	1	6	4.6825523	1.27801515
454	2016	1.21110104	0.47329384	1	18.231691	1	3	3.61810076	2.89142953
454	2015	0.8185253	1.33144264	1	18.6116	1	3	3.59013586	2.89833012
454	2014	0.2615932	1.07746151	1	18.758473	1	4	4.00828419	2.86079698
454	2013	0.14937128	0.87435854	1	18.845841	1	4	4.22059799	3.12276551
454	2012	0.21380004	1.23304061	1	18.74473	1	3	4.20545901	3.18645891
455	2016	0.18252654	0.03373647	1	19.779935	0	6	3.86180419	0.53189451
455	2015	0.59258513	0.01584087	1	19.920685	0	7	3.95254239	1.27217588
455	2014	1.17378593	0.28846227	1	19.994698	0	7	3.80317863	1.84345731
455	2013	0.44168388	0.90886725	1	20.182115	0	6	3.82215666	2.06306289
455	2012	0.38064564	0.63244237	1	20.213778	0	6	3.88521656	2.08727193
456	2016	0.00266345	0.19907788	0	15.3188	1	7	4.32220452	1.23977441
456	2015	0.00234625	0.19396764	0	15.31674	1	7	4.24575244	1.513053
456	2014	0.00873078	0.27126606	0	15.418127	1	7	4.26596744	1.77784849
456	2013	0.03702793	0.36481393	0	15.515082	1	7	4.38070063	1.93056516
456	2012	0.01563513	0.31890527	0	15.473953	1	7	4.37251551	1.95969611
457	2016	0.06021889	0.03951298	1	19.522404	1	6	4.4994941	0.4725429
457	2015	0.14732371	0.1035606	1	19.483522	1	7	4.39337937	0.59547867
457	2014	0.16734919	0.19826708	1	19.571376	1	7	4.57580632	1.28149535
457	2013	0.15671225	0.2497255	1	19.479872	1	6	4.35491309	1.09060733

457	2012	0.14708549	0.18675837	1	19.564849	1	6	4.40879463	0.98956833
458	2016	0.01135924	0.05735434	1	20.137027	1	7	3.03026915	0.63724909
458	2015	0.0098226	0.04310163	1	20.115617	1	7	2.62491936	0.53303594
458	2014	0.00696171	0.05080528	1	20.390355	1	7	2.71972518	0.62276871
458	2013	0.01337121	0.06286399	1	20.371609	1	6	2.76964834	0.78083612
458	2012	0.07339636	0.08615751	1	20.362562	1	6	2.82216625	0.75722794
459	2016	0.15336466	0.0131995	1	20.704563	0	6	3.45053695	0.71630056
459	2015	0.31816569	0.0730153	1	20.908571	0	7	3.30407238	0.73953637
459	2014	0.59490957	0.11619867	1	21.212847	0	7	3.39511613	1.28280515
459	2013	0.397525	0.52346442	1	21.241838	0	6	3.43704449	1.43016147
459	2012	0.29508609	0.31931808	1	21.429618	0	6	3.38487608	1.35756098
460	2016	0.78749963	0.40162909	1	16.014452	1	7	3.97113938	1.63959518
460	2015	0.28631589	0.11283303	1	16.031257	1	7	4.016261	1.6489332
460	2014	0.3181766	0.41905633	1	15.967867	1	7	4.02438372	1.6519599
460	2013	0.52250891	0.0829063	1	15.958962	1	7	4.04308527	1.2908861
460	2012	0.13340001	0.35372821	1	15.808938	1	7	4.05642092	1.21023983
461	2016	0.00605066	0.07427224	1	15.308968	1	6	4.13950239	0.46240483
461	2015	0.07427224	0.11055341	1	15.445905	1	6	4.15867311	0.74813335
461	2014	0.22643573	0.13771812	1	15.578778	1	7	4.21318143	0.95035858
461	2013	0.27027138	0.14184933	1	15.645971	1	6	4.25932023	1.23951792
461	2012	0.14184933	0.16173868	1	15.667938	1	6	4.15896167	1.21900643
462	2016	0.30175434	0.23316754	1	17.028596	1	7	4.30323212	1.25776757
462	2015	0.11782215	0.16729336	1	17.045896	1	7	4.18816372	1.08142239
462	2014	0.17707867	0.3066601	1	17.15125	1	7	4.13917149	1.02620287
462	2013	0.08320263	0.21105963	1	17.242559	1	7	4.05469162	0.96355669
462	2012	0.30634655	0.12410346	1	17.360125	1	7	4.10233218	0.91909799

463	2016	0.30626778	0.27153364	1	17.024985	1	7	3.89306471	0.98661312
463	2015	0.11909418	0.16854121	1	17.03451	1	7	3.69034967	0.82467093
463	2014	0.18165467	0.30694411	1	17.143181	1	7	3.53644279	1.02547835
463	2013	0.0832882	0.21347213	1	17.241483	1	7	3.31224984	0.97137798
463	2012	0.30969035	0.1253296	1	17.34751	1	7	3.30052678	0.92539635
464	2016	0.00219559	0.00163366	0	17.916118	1	8	4.57234181	0.10607746
464	2015	0.00250885	0.00417428	0	17.929491	1	8	4.54830681	0.10680567
464	2014	0.0112663	0.00927386	0	17.96625	1	8	4.45628353	0.08388516
464	2013	0.00473975	0.00318393	0	18.09322	1	8	4.63251819	0.09675913
464	2012	0.0060934	0.00526213	0	18.051042	1	7	4.64652673	0.11259359
465	2016	1.07994276	0.12873001	1	15.441687	0	6	3.82384814	2.73457392
465	2015	1.76438159	0.6167142	1	15.346512	0	6	3.64062816	2.89235451
465	2014	0.64259624	0.66665894	1	15.484051	0	6	3.58771283	2.92861085
465	2013	0.67362485	2.49570027	1	15.707804	0	6	3.80296065	3.08885811
465	2012	0.33086296	1.58947946	1	15.764501	0	6	4.10384426	3.21566933
466	2016	1.12985156	0.25810289	1	16.35635	0	6	4.05371842	2.36291885
466	2015	1.46402201	0.34920652	1	16.370424	0	6	3.93961414	2.67080707
466	2014	1.51888631	0.49418697	1	16.48685	0	6	3.87707893	2.95477381
466	2013	0.94688007	1.97804234	1	16.661881	0	6	3.95783846	3.28488792
466	2012	0.46497852	1.47810228	1	16.75537	0	6	4.08941527	3.47924385
467	2016	0.02475407	0.07540613	1	17.134706	0	7	3.45166227	1.09870095
467	2015	0.02034464	0.04609606	1	17.055188	0	7	2.95623201	0.97938121
467	2014	0.03523972	0.08286672	1	17.44129	0	6	3.04071859	1.08462695
467	2013	0.02455016	0.14124693	1	17.539007	0	6	3.06531216	1.32854209
467	2012	0.03544436	0.21782544	1	17.565041	0	6	3.12509964	1.47046362
468	2016	0.03161785	0.04649038	1	19.106746	0	7	4.4261519	0.90768985

468	2015	0.03229486	0.05509596	1	19.126767	0	7	4.28689661	0.84861642
468	2014	0.03463328	0.13685599	1	19.288061	0	6	4.31941186	0.82692429
468	2013	0.03204503	0.183659	1	19.383352	0	6	4.47037205	0.84190937
468	2012	0.04171472	0.14545613	1	19.350054	0	6	4.47183811	0.74542696
469	2016	0.00682962	0.12470922	1	16.820946	1	7	4.27299419	0.78979737
469	2015	0.00863957	0.21314251	1	16.804295	1	7	4.14807501	0.87002729
469	2014	0.0137382	0.3306065	1	16.887301	1	7	4.09871394	0.91880397
469	2013	0.01505116	0.34904078	1	17.000958	1	7	4.21499957	1.49632588
469	2012	0.01194537	0.29918269	1	16.964843	1	7	4.16570377	1.37050638
470	2016	0.00012999	0.27234049	1	16.038026	1	7	4.11921033	0.09920984
470	2015	0.00036793	0.11363578	1	16.090378	1	7	4.04695445	0.08333881
470	2014	0.00040992	0.13572162	1	16.250277	1	7	4.10913997	0.0997494
470	2013	0.00042891	0.01404984	1	16.290378	1	7	4.17558355	0.15005401
470	2012	0.00041891	0.09224184	1	16.314782	1	7	4.17492677	0.96575534
471	2016	0.7803812	3.51525354	0	12.734664	1	7	4.69365134	1.51512547
471	2015	0.881433	3.45316136	0	12.557091	1	7	4.5585815	1.56736973
471	2014	0.29080295	3.27037223	0	12.558532	1	7	4.3233943	1.58218017
471	2013	0.89120387	3.29815776	0	12.766981	1	6	4.31844447	1.25907643
471	2012	0.37076531	3.40715967	0	12.903938	1	6	4.52371283	2.02466561
472	2016	0.12237514	0.11790836	1	15.906859	1	6	4.42582621	0.75109292
472	2015	0.07627191	0.18579801	1	15.995642	1	7	4.60274233	0.62899419
472	2014	0.16572882	0.2579221	1	15.857371	1	7	4.60210211	0.69654391
472	2013	0.2866125	0.22651227	1	15.639796	1	6	4.66805401	1.21457055
472	2012	0.31736514	0.20669217	1	15.373164	1	6	4.56557973	1.35129056
473	2016	0.06131521	0.05831796	1	18.010919	1	7	3.44528721	0.33246135
473	2015	0.05831796	0.05001608	1	17.989073	1	7	3.44646296	0.36857772

473	2014	0.06338504	0.04900062	1	17.935499	1	7	3.4708244	0.42810879
473	2013	0.06794833	0.0766295	1	17.917123	1	7	3.55501035	0.51697846
473	2012	0.06132555	0.13223981	1	17.890937	1	7	3.56461757	0.5505416
474	2016	0.06504121	0.05713525	1	18.764147	1	7	4.12413216	0.40222921
474	2015	0.06005411	0.06141396	1	18.729968	1	7	4.128086	0.40777311
474	2014	0.06522485	0.07391102	1	18.713869	1	7	4.13701568	0.39636987
474	2013	0.06005222	0.08434482	1	18.751973	1	7	4.28207079	0.44701963
474	2012	0.06194892	0.10380851	1	18.695545	1	7	4.29043788	0.44126652
475	2016	1.03972356	0.56580801	1	14.602593	1	4	4.16730313	2.61433356
475	2015	0.09259012	0.61536238	1	14.633236	1	4	4.10837142	2.66117709
475	2014	0.0348564	0.63214267	1	14.736286	1	4	4.22784589	2.73922207
475	2013	0.0042868	0.598931	1	14.718609	1	4	4.27110506	2.60145811
475	2012	0.0129103	0.49652932	1	14.658418	1	4	4.23713996	2.39953293
476	2016	0.88228752	1.01747454	1	14.243601	0	7	4.3608727	2.38359367
476	2015	0.0175216	0.62501608	1	14.26174	0	7	4.26230726	2.03197945
476	2014	0.69928133	0.63037989	1	14.392608	0	7	4.23078755	2.08889398
476	2013	0.75618817	0.5286121	1	14.488148	0	7	4.47589792	2.36466202
476	2012	0.26249195	0.67280671	1	14.332229	0	7	4.35130743	2.36644335
477	2016	0.25776061	0.1944288	1	17.029614	1	6	4.14879671	2.8459798
477	2015	0.30983341	0.08293299	1	17.278901	1	6	4.05866405	2.66862043
477	2014	0.24234364	0.09165441	1	17.601222	1	5	4.16964818	2.91814601
477	2013	0.36473478	1.21439243	1	17.764052	1	5	4.3281702	3.05136346
477	2012	0.36954773	0.81089288	1	17.80416	1	5	3.8276521	2.28083026
478	2016	2.07871465	1.08073307	1	14.272382	1	5	3.91032783	3.01247267
478	2015	1.19228355	1.73791855	1	14.295709	1	5	3.84971434	2.94764678
478	2014	1.74967018	1.09840027	1	14.535245	1	5	4.06665946	3.18197878

478	2013	0.00678791	1.00845816	1	14.676024	1	5	4.34762201	3.20350315
478	2012	0.88084178	1.13232749	1	14.551997	1	5	4.38909775	3.09093845
479	2016	0.87726296	0.74450167	1	18.268854	1	3	4.02055056	3.5453478
479	2015	0.85507681	1.5044571	1	18.377081	1	3	3.94753327	3.42110543
479	2014	0.63338603	1.52488431	1	18.5014	1	4	4.01953173	3.37714158
479	2013	0.72840283	1.50611465	1	18.658834	1	3	4.53887016	3.57423876
479	2012	0.35026031	1.65831417	1	18.347001	1	3	4.5345103	2.60492592
480	2016	0.01387036	0.22593725	1	13.085511	1	4	4.07380818	1.7482152
480	2015	0.24586505	0.54323144	1	13.028141	1	4	4.03279061	1.69593813
480	2014	0.03235489	0.6888821	1	13.088207	1	4	3.96666781	1.59790871
480	2013	0.06531853	0.46041152	1	13.233106	1	4	4.17047398	1.65391307
480	2012	0.03937262	0.11668199	1	13.188185	1	4	4.14104987	1.58396071
481	2016	1.14205421	1.27177032	1	17.165552	1	7	3.94212209	3.8953089
481	2015	1.26293958	1.41611235	1	16.973697	1	7	3.40769294	3.38144308
481	2014	1.64596249	1.85223365	1	17.095681	1	7	3.41822194	1.82476927
481	2013	1.74049775	1.99439782	1	17.176834	1	7	3.87113526	1.97573133
481	2012	1.43001	1.74328133	1	17.162506	1	7	4.16979901	1.8865818
482	2016	0.58976471	0.33416601	1	14.633538	0	7	4.36874322	1.76473439
482	2015	0.48069317	0.41230301	1	14.6119	0	7	4.26129369	1.55631727
482	2014	0.09678001	0.44473133	1	14.657792	0	7	4.11527141	1.51788014
482	2013	0.00784415	0.4646399	1	14.778999	0	7	4.14825142	2.31862477
482	2012	0.03180676	0.48190626	1	14.775463	0	7	4.12322114	2.30748238
483	2016	0.14800699	0.60679813	1	13.410335	0	6	4.08691565	2.20715456
483	2015	0.08341333	0.8625515	1	13.378289	0	6	3.99864018	2.07407178
483	2014	0.24007775	0.69260904	1	13.455664	0	6	4.05931626	2.00694504
483	2013	0.02953453	0.67020348	1	13.507917	0	6	4.26782965	1.95261618

483	2012	0.11041641	0.55711151	1	13.444758	0	6	4.34881671	2.02529391
484	2016	0.02429351	0.26251041	1	15.602994	1	7	4.04369601	1.54735376
484	2015	0.02096568	0.48874871	1	15.693831	1	7	4.09469432	1.71992184
484	2014	0.06632318	0.60417771	1	15.795987	1	7	4.15020742	1.83447695
484	2013	0.02570771	0.74416866	1	15.901969	1	7	4.29616235	1.97556631
484	2012	0.0283853	0.76176892	1	15.845107	1	7	4.32447086	1.58204123
485	2016	0.08031006	0.49882855	1	18.58548	1	7	4.03451037	1.87994936
485	2015	0.09115428	0.66302142	1	18.640428	1	7	3.87585962	1.97970256
485	2014	0.08306276	0.79980366	1	18.809426	1	7	3.90150339	1.95570516
485	2013	0.08094937	0.63834299	1	19.009386	1	7	4.07254751	2.04975085
485	2012	0.10277498	0.53417548	1	19.006195	1	7	4.00760069	1.91939367
486	2016	0.0356258	0.03721967	1	12.485764	0	6	4.17354719	1.65008799
486	2015	0	0.21289198	1	12.446148	0	6	4.14310047	1.8824735
486	2014	0.60820457	0.14905773	1	12.494316	0	6	4.12128533	2.09421611
486	2013	0	0.24139989	1	12.569952	0	6	4.28869709	2.20649184
486	2012	0.46045695	0.32531595	1	12.50625	0	6	4.35005705	1.94771281
487	2016	0	0.21394941	1	15.180976	1	6	3.81613396	1.44824939
487	2015	0.03514318	0.26713364	1	15.022943	1	6	3.71461542	1.56110906
487	2014	0.14110973	0.22457852	1	15.155839	1	6	3.6640545	1.25102174
487	2013	0.10576713	0.29901956	1	15.254096	1	6	3.95335167	1.48260654
487	2012	0.01272865	0.36271974	1	15.080505	1	6	4.08113343	1.44833563
488	2016	0.0222154	0.27165787	1	16.573686	1	7	3.67600199	1.34103781
488	2015	0.00591746	0.06393396	1	16.542853	1	7	3.56484058	1.44586172
488	2014	0.00315601	0.18081709	1	16.66372	1	7	3.52535269	1.52756777
488	2013	0.00478454	0.4869732	1	16.815065	1	7	3.70374548	1.67728365
488	2012	0.02429351	0.61453299	1	16.800476	1	7	3.77729549	1.458415

489	2016	0.80923767	0.01616858	1	15.070782	1	7	4.10102071	1.69483732
489	2015	0.59831549	0.64894343	1	15.0994	1	7	3.99586109	1.7358961
489	2014	0.90668636	0.92811851	1	15.129567	1	7	3.99708391	1.95474614
489	2013	1.64174575	1.37254071	1	15.251189	1	7	4.27512002	3.15729302
489	2012	1.27619011	1.17041219	1	15.241843	1	7	4.27338952	2.64470975
490	2016	0.05215118	0.01094884	1	17.541586	1	7	3.92322542	1.30806197
490	2015	0.01215779	0.11094191	1	17.51945	1	7	3.79646992	1.51219745
490	2014	0.01993105	0.58008822	1	17.662097	1	7	3.83084056	1.63651286
490	2013	0.02848833	0.69565254	1	17.758951	1	7	3.96444417	1.75675835
490	2012	0.02786416	0.71585343	1	17.777123	1	7	4.017077	1.86907785
491	2016	0.00118729	0.00040692	1	14.899827	1	6	1.79547423	0.00424597
491	2015	4.4999E-05	0.00108042	1	14.815297	1	7	2.03793533	0.00516663
491	2014	0.0004549	0.04439385	1	14.77239	1	7	2.17852867	0.00561023
491	2013	0.03424199	0.02625335	1	14.521177	1	6	2.27870123	0.30912673
491	2012	0.0038456	0.06677695	1	14.400684	1	6	1.97164431	0.27660545
492	2016	0.58544671	0.24028539	1	17.636812	1	7	4.62408126	0.93865713
492	2015	0.61311647	0.231445	1	17.513384	1	7	4.51075551	1.18251645
492	2014	0.73413748	0.28158527	1	17.475969	1	7	4.46189664	1.27895522
492	2013	0.79632271	0.315261	1	17.521501	1	6	4.57853068	1.49249682
492	2012	0.86587915	0.29442032	1	17.451917	1	6	4.60153961	1.51294992
493	2016	0.06179288	0.02084914	1	18.622126	0	7	4.49924145	1.24663911
493	2015	0.08453231	0.04534997	1	18.623501	0	7	4.39476324	1.32009526
493	2014	0.07845899	0.11518678	1	18.730618	0	6	4.36582353	1.38314942
493	2013	0.05920149	0.17701416	1	18.869801	0	6	4.57828071	1.58634737
493	2012	0.10571315	0.15909387	1	18.759586	0	6	4.57749151	1.60412201
494	2016	0.19421801	0.19055755	0	15.050838	1	7	4.34196116	1.74238381

494	2015	0.3192287	0.22693794	0	14.999554	1	7	4.28787495	1.8288033
494	2014	0.31349601	0.33194199	0	15.059507	1	6	4.22517558	1.93080637
494	2013	0.21611088	0.53684594	0	15.101415	1	6	4.41753642	2.19045449
494	2012	0.34229738	0.64574578	0	14.954767	1	6	4.28879899	1.83490005
495	2016	0.15392208	0.05322887	1	20.705618	0	6	3.52301142	0.71766417
495	2015	0.31931227	0.07423232	1	20.912524	0	7	3.35595584	0.7402254
495	2014	0.59320087	0.11846813	1	21.218225	0	7	3.46010615	1.24671586
495	2013	0.39653872	0.49746557	1	21.249596	0	6	3.4195537	1.41891619
495	2012	0.29685116	0.30748176	1	21.451202	0	6	3.40554654	1.33120915
496	2016	0.00572757	0.31191238	1	15.293593	1	7	3.99704699	0.91895717
496	2015	0.00248491	0.02139841	1	15.399017	1	7	3.93247556	1.1054098
496	2014	0.00291674	0.29736455	1	15.575733	1	7	3.88197204	0.84659804
496	2013	0.00296061	0.11010743	1	15.719769	1	7	4.00368384	1.04203665
496	2012	0.00737176	0.17053655	1	15.732902	1	7	4.03645571	1.6084268
497	2016	0.73306861	0.51458017	1	14.040271	0	6	4.22231011	2.58342901
497	2015	0.31935369	0.35957753	1	13.92869	0	6	4.13296599	2.65823385
497	2014	0.29899212	1.3916771	1	13.91785	0	6	3.87608448	2.49564899
497	2013	0.1506606	0.55930488	1	14.063376	0	6	4.04529415	2.4333191
497	2012	0.27195276	0.20126188	1	13.988083	0	6	4.15046661	2.42872767
498	2016	0.46247977	0.43255939	1	17.396667	1	6	4.24653671	1.74829492
498	2015	0.55498738	0.43837428	1	17.393812	1	6	4.1657601	1.76784546
498	2014	0.4597683	0.53068354	1	17.462271	1	6	4.25549697	1.968801
498	2013	0.5069188	0.79859264	1	17.376911	1	6	4.76855506	2.36756164
498	2012	0.79485729	0.65940941	1	16.778902	1	6	4.31052567	1.64104568
499	2016	0.1440406	0.55235693	1	15.978025	1	6	4.69590278	1.98972018
499	2015	0.25239551	0.79728825	1	15.699158	1	6	4.27563698	1.95806597

499	2014	0.09320159	1.09828857	1	15.8181	1	6	4.16962249	2.08184627
499	2013	0.06485191	1.07136236	1	16.062853	1	6	4.30859872	1.78239896
499	2012	0.04714309	0.87290378	1	16.153937	1	6	4.40945825	1.38985003
500	2016	0.79388352	0.02690869	1	18.435058	1	6	4.53089625	1.17791287
500	2015	0.71787687	0.48511389	1	18.359815	1	6	4.50338502	1.35304389
500	2014	0.92236226	0.49259526	1	18.269825	1	6	4.26463742	1.46060421
500	2013	0.69699427	0.61437991	1	18.415041	1	5	4.42109051	1.49310677
500	2012	0.75778679	0.74080146	1	18.357184	1	5	4.38903035	1.44683474
501	2016	0.08271299	0.01957221	1	19.736889	1	6	4.10154445	0.34571581
501	2015	0.0848006	0.02245206	1	19.848634	1	7	4.24540989	0.41610695
501	2014	0.14035829	0.0866088	1	19.881027	1	7	4.21811584	0.49637471
501	2013	0.15706272	0.15628469	1	19.913825	1	6	4.21251369	0.54691664
501	2012	0.2570347	0.29182523	1	19.951992	1	6	4.21285727	1.04069853
502	2016	0.00323177	0.00446601	1	17.538741	1	8	4.31233137	0.03277982
502	2015	0.00322779	0.01075694	1	17.608164	1	8	4.39814415	0.04494086
502	2014	0.00431667	0.0074065	1	17.595504	1	8	4.18645472	0.01182481
502	2013	0.0071613	0.00211676	1	17.769804	1	7	4.3737311	0.01859798
502	2012	0.01143932	0.00621366	1	17.755444	1	7	4.39162742	0.02066696
503	2016	0.09697334	1.0450174	1	14.434797	1	6	4.48766015	2.21256421
503	2015	0.07683233	1.11151338	1	14.429897	1	7	4.76715727	2.05055867
503	2014	1.21030481	1.32371871	1	14.015192	1	7	4.7290416	2.66780984
503	2013	0.92895856	1.4884664	1	13.6717	1	6	4.46564714	2.41617562
503	2012	0.82214136	1.37776156	1	13.526384	1	6	4.60194995	2.41813381
504	2016	0.12897264	0.34388186	1	14.489461	1	6	4.0852741	1.46900988
504	2015	0.59072014	0.6310558	1	14.428201	1	6	3.92607574	1.55065538
504	2014	0.83999569	0.66229305	1	14.504216	1	5	3.81129163	1.65186502

504	2013	0.80874784	0.92434382	1	14.569398	1	5	4.57869775	2.18977165
504	2012	0.97373062	0.7019414	1	13.937024	1	5	4.28618117	2.12551731
505	2016	0.02008298	0.01570109	0	15.790559	0	8	4.50844038	0.03575124
505	2015	0.01570109	0.02127214	0	15.757561	0	8	3.64055367	0.02593769
505	2014	0.01736633	0.03394432	0	16.51541	0	8	4.4002603	0.13820856
505	2013	0.02904799	0.04787451	0	16.546542	0	7	4.54507195	0.15379776
505	2012	0.04444837	0.00960968	0	16.381624	0	7	4.42817424	0.20842537
506	2016	0.04328552	0.03638593	1	19.482575	1	8	3.96750261	0.17224428
506	2015	0.05375875	0.03018191	1	19.504864	1	8	3.82719211	0.15703879
506	2014	0.0753746	0.04329126	1	19.648554	1	8	3.77892249	0.20450941
506	2013	0.03841558	0.04656674	1	19.773462	1	7	3.93381743	0.18523979
506	2012	0.06734552	0.04119281	1	19.748269	1	7	3.96757992	0.30681757
507	2016	0.52019579	0.38101803	1	14.951785	0	6	4.38932598	2.00520064
507	2015	0.7316205	0.14554865	1	14.877223	0	6	4.15432079	2.17401133
507	2014	1.02886127	0.14673151	1	14.980594	0	6	4.1767255	2.41408729
507	2013	0.17676364	1.35923838	1	15.068479	0	6	4.37651002	2.589008
507	2012	0.40770659	0.99061162	1	15.097824	0	6	4.43088345	2.33866173
508	2016	0.01319457	0.00142099	1	16.968163	1	6	4.32829228	0.47335924
508	2015	0.02203641	0.04875588	1	17.071688	1	7	4.45938572	0.64370638
508	2014	0.03219126	0.08343449	1	17.030926	1	7	4.4424567	0.81307547
508	2013	0.08463706	0.15105446	1	16.987576	1	6	4.48126475	1.46052552
508	2012	0.2366227	0.08640519	1	16.893449	1	6	4.36598724	1.34725463
509	2016	0.04759135	0.00348193	0	13.576447	1	7	4.46823003	1.13137147
509	2015	0.00965821	0.07126522	0	13.451861	1	7	4.40648688	1.07957964
509	2014	0.02530121	0.09508197	0	13.441991	1	7	4.26437746	0.8839919
509	2013	0.02221833	0.06245635	0	13.543625	1	6	4.50636344	1.07045798

509	2012	0.05594829	0.04544457	0	13.39859	1	6	4.36421721	1.01967405
510	2016	1.19277029	0.77102539	0	13.578301	1	7	4.56454954	2.14269588
510	2015	1.01544479	0.86195492	0	13.594546	1	7	4.46060201	2.0816607
510	2014	1.1111915	0.90611877	0	13.716574	1	7	4.35563139	2.02325736
510	2013	1.08102928	1.04449712	0	13.95295	1	6	4.49963039	2.11025102
510	2012	1.05159161	0.93822129	0	13.98606	1	6	4.38269432	1.99684753
511	2016	0.0888704	2.70972234	0	13.289585	0	7	4.34116895	2.01803664
511	2015	0.01078167	2.60484056	0	13.513103	0	7	4.31106651	1.85830535
511	2014	0.11405253	2.53455391	0	13.786543	0	7	4.3100209	1.62776671
511	2013	0.48715753	2.61060538	0	14.060022	0	6	4.50379008	1.53600685
511	2012	0.12760663	0	0	14.14203	0	6	4.4159042	1.23462489
512	2016	0.24270144	0.12044083	1	21.079328	0	7	3.45532764	1.00146132
512	2015	0.02146301	0.1500084	1	21.096725	0	7	3.35463848	0.9854309
512	2014	0.15823461	0.17239916	1	21.185874	0	7	3.28841845	1.05398027
512	2013	0.01646766	0.25544887	1	21.238777	0	6	3.39615057	1.19874717
512	2012	0.01879035	0.26682813	1	21.224297	0	6	3.45832237	1.20659546
513	2016	0.03668288	0.03492689	0	13.715869	0	8	4.30401904	0.23275085
513	2015	0.01804226	0.0743493	0	13.683594	0	8	4.34240642	0.21351656
513	2014	0.06154655	0.03313686	0	13.693755	0	8	4.23901448	0.19396764
513	2013	0.20942346	0.06247233	0	13.762899	0	7	4.4444781	0.51565256
513	2012	0.04358904	0.12862186	0	13.67909	0	7	4.49233736	0.53375747
514	2016	0.01108434	0.05935228	0	15.132905	0	7	3.95412662	0.35136226
514	2015	0.01266842	0.07271221	0	15.111478	0	7	3.87203531	0.4088022
514	2014	0.02918009	0.11873547	0	15.175829	0	7	3.86123382	0.51671843
514	2013	0.02022215	0.64427884	0	15.265098	0	7	3.99137066	0.61274157
514	2012	0.01789296	0.16454024	0	15.208196	0	7	3.87931236	0.6927531

515	2016	0.02781456	0.36557879	0	14.946037	1	7	4.18540112	2.64008444
515	2015	0.03139982	0.42101032	0	14.861317	1	7	4.11646082	2.61527665
515	2014	0.02329359	0.69894932	0	14.819984	1	6	3.95713021	2.49902181
515	2013	0.06559577	1.0847172	0	14.958967	1	6	4.10933903	2.62462048
515	2012	0.05357679	0.94919036	0	14.940281	1	6	4.34247957	2.77967884
516	2016	0.01062337	0.43805104	0	16.234004	0	7	4.30455662	0.57608401
516	2015	0.01327746	0.58629277	0	16.217112	0	7	4.20045209	0.67811527
516	2014	0.01245215	0.1231579	0	16.314031	0	7	4.16903242	0.81837973
516	2013	0.01599736	0.08020485	0	16.422009	0	7	4.34056275	0.82633364
516	2012	0.04645315	0.33318398	0	16.338968	0	7	4.29498408	0.86488501
517	2016	0.03904377	0.8421515	0	16.068403	0	7	4.18173547	0.30924051
517	2015	0.04205899	0.04212802	0	16.050033	0	7	4.06650842	0.48363529
517	2014	0.0395793	0.03157134	0	16.122572	0	7	4.02749896	0.53194503
517	2013	0.05071593	0.05180466	0	16.203702	0	7	4.1790801	0.92809597
517	2012	0.06297574	0.01545791	0	16.127533	0	7	4.13634533	1.0235514
518	2016	0.0054362	0.46077619	0	15.626443	0	7	4.38901434	1.15564994
518	2015	0.00392827	0.19867297	0	15.575251	0	7	4.20350604	1.30249419
518	2014	0.00401194	0.2102123	0	15.728084	0	7	4.1538796	1.55586877
518	2013	0.0031909	0.16058195	0	15.843378	0	7	4.29819533	1.8517927
518	2012	0.00883387	0.29763933	0	15.786917	0	7	4.22349933	1.89537957
519	2016	0.0341009	0.54950484	0	16.514607	0	7	4.364312	0.63647312
519	2015	0.03663468	0.41522202	0	16.502648	0	7	4.24767882	0.69421961
519	2014	0.02795558	0.12370237	0	16.619647	0	7	4.22379199	0.78253806
519	2013	0.03390179	0.04905013	0	16.722872	0	7	4.40612265	0.9906573
519	2012	0.04340234	0.03146088	0	16.636214	0	7	4.35645199	1.04270239
520	2016	0.05100675	0.1315597	0	15.600361	0	7	4.44019433	0.53478899

520	2015	0.01229807	0.13455537	0	15.645827	0	7	4.36218884	0.46059513
520	2014	0.01126827	0.07422397	0	15.721369	0	7	4.35222418	0.70111138
520	2013	0.01609085	0.03460913	0	15.828403	0	7	4.47557432	0.78343431
520	2012	0.03871097	0.01550517	0	15.8023	0	7	4.46045357	0.78461453
521	2016	0.01864902	0.94889305	0	16.072733	0	7	4.29217867	0.3620077
521	2015	0.02275513	0.20414583	0	16.079112	0	7	4.21136956	0.39577026
521	2014	0.0212829	0.04384941	0	16.17905	0	7	4.16760272	0.48951455
521	2013	0.01808154	0.28302851	0	16.29851	0	7	4.35771195	0.65449315
521	2012	0.02434524	0.12377129	0	16.230707	0	7	4.32176801	0.8147394
522	2016	0.03967926	0.23717663	0	15.428775	0	7	4.27101488	0.56781012
522	2015	0.0230239	0.23711667	0	15.435964	0	7	4.19794038	0.60985524
522	2014	0.02876043	0.20312695	0	15.505178	0	7	4.1731542	0.73756016
522	2013	0.02649294	0.22896656	0	15.586882	0	7	4.34115976	0.8745725
522	2012	0.14988789	0.05388194	0	15.526147	0	7	4.32634528	0.58768055
523	2016	0.02799058	0.51706492	0	15.804073	0	7	4.20743372	0.40476019
523	2015	0.03386505	0.28239839	0	15.820672	0	7	4.07122963	0.4825317
523	2014	0.029318	0.21720274	0	15.921019	0	7	4.08627403	0.66408854
523	2013	0.02881581	0.32547629	0	15.983142	0	7	4.27411132	1.10291535
523	2012	0.03977344	0.2792176	0	15.930544	0	7	4.23391005	1.1807749
524	2016	0.01919558	0.03567212	0	15.463788	0	7	4.40634101	1.09939698
524	2015	0.00606457	0.18682225	0	15.46388	0	7	4.26851769	1.17008763
524	2014	0.00630806	0.0554839	0	15.610831	0	7	4.19436061	1.36736533
524	2013	0.01295275	0.09182685	0	15.772488	0	7	4.37562935	1.65198329
524	2012	0.01285008	0.02355538	0	15.720311	0	7	4.36853172	1.60491028
525	2016	0.00630011	0.3149173	0	15.548041	0	7	4.16916739	0.77288538
525	2015	0.0076447	0.29235763	0	15.605372	0	7	4.05306168	0.83511061

525	2014	0.00939374	0.2432034	0	15.755122	0	7	4.01608824	0.84318785
525	2013	0.00973447	0.72574118	0	15.93371	0	7	5.27696562	1.57862957
525	2012	0.10699438	0.22903814	0	14.847833	0	7	4.18075792	1.48267034
526	2016	0.00111538	0.00016699	0	18.691025	1	8	4.57465483	0.00855629
526	2015	0.002	0.00017299	0	18.700326	1	8	4.55089928	0.00939077
526	2014	0.00311116	0.00185328	1	18.734494	1	8	4.46461674	0.01464917
526	2013	0.00420714	0.00240311	1	18.847796	1	8	4.65832421	0.0304778
526	2012	0.00643127	0.00252381	1	18.773848	1	7	4.68431146	0.01682368
527	2016	0.00481041	0.17623977	0	15.41982	0	7	4.07521353	0.79880905
527	2015	0.00412946	0.1273575	0	15.443625	0	7	3.97635474	0.89957459
527	2014	0.00577131	0.18568838	0	15.545919	0	7	3.95708275	0.93089477
527	2013	0.01737812	1.3712358	0	15.645422	0	7	4.13958029	1.08151394
527	2012	0.00725561	0.13176396	0	15.552738	0	7	4.09316131	1.07066367
528	2016	0.01085685	0.04693034	0	16.733972	0	7	4.24658217	0.05987611
528	2015	0.00859991	0.21523798	0	16.738029	0	7	4.20709165	0.06411593
528	2014	0.00581904	0.01525997	0	16.809332	0	7	4.11908231	0.21484925
528	2013	0.00432663	0.02361105	0	16.924533	0	7	4.25765731	0.26438223
528	2012	0.13710537	0.01340475	0	16.873378	0	7	4.2347003	0.25954259
529	2016	0.28772232	0.3620258	1	20.289241	1	6	3.70988344	0.93156114
529	2015	0.35700709	0.52325881	1	20.276654	1	7	3.60233848	1.01981436
529	2014	0.24604647	0.27596975	1	20.399975	1	7	3.77038942	0.78945959
529	2013	0.21345517	0.22821149	1	20.328263	1	6	3.8546004	0.74446035
529	2012	0.17681727	0.18393775	1	20.262461	1	6	3.87634124	0.69470696
530	2016	0.28818794	0.3412636	1	20.287381	1	6	3.70886486	0.93090699
530	2015	0.35668304	0.50888715	1	20.277733	1	7	3.59993386	1.01791801
530	2014	0.23128948	0.27493036	1	20.402942	1	7	3.76987462	0.78889136

530	2013	0.20289758	0.22574257	1	20.329304	1	6	3.84614755	0.73971297
530	2012	0.16913837	0.18731822	1	20.271523	1	6	3.89037554	0.69887922
531	2016	0.00717023	0.12661327	1	16.523557	0	7	4.23526787	1.41469934
531	2015	0.01002261	0.13668504	1	16.568972	0	7	4.14089955	1.49722777
531	2014	0.01844779	0.24550056	1	16.680112	0	7	4.13402967	1.64589905
531	2013	0.02624166	0.41824904	1	16.792786	0	7	4.26510124	1.86970074
531	2012	0.0530781	0.33820573	1	16.771838	0	7	4.27362147	1.87298778
532	2016	0.01045515	0.00157676	1	11.8272	0	6	3.5957163	0.25547443
532	2015	0	0.01824161	1	11.351619	0	6	2.82215091	0.17619952
532	2014	0	0.0346101	1	11.518682	0	6	2.61780436	0.1444769
532	2013	0	0.0690222	1	11.512732	0	6	3.02143827	0.02398016
532	2012	0	0	1	11.535507	0	6	3.01787706	0.46858763
533	2016	0.03938128	0.07901356	1	17.47491	1	6	3.62154749	0.0812592
533	2015	0.08618045	0.19467741	1	17.531752	1	7	3.90626307	0.10390315
533	2014	0.06626609	0.10857365	1	17.280168	1	7	3.63553941	0.06416095
533	2013	0.09185878	0.06090599	1	17.26199	1	6	3.64095721	0.08822697
533	2012	0.33788481	0.11965329	1	17.235651	1	6	3.89143894	0.45067235
534	2016	0.00632496	0.06172331	1	19.485217	1	8	4.29374565	0.25158484
534	2015	0.01174871	0.0506627	1	19.515294	1	8	4.11878667	0.25292912
534	2014	0.00987607	0.05781126	1	19.712861	1	8	4.1045382	0.25525676
534	2013	0.01601113	0.04943186	1	19.773416	1	8	4.28035973	0.25809207
534	2012	0.01385458	0.05256683	1	19.721168	1	7	4.27728336	0.27461963
535	2016	0.01878544	0.05756394	1	19.286575	0	8	4.16222661	0.30075697
535	2015	0.01565482	0.02534216	1	19.355124	0	8	4.1042369	0.23171551
535	2014	0.01938391	0.01889241	1	19.429331	0	8	4.12845157	0.25146275
535	2013	0.04394703	0.0032836	1	19.464344	0	7	4.21536669	0.34438584

535	2012	0.06489689	0.0384252	1	19.464302	0	7	4.23275479	0.58486908
536	2016	0.18335685	0.05916568	1	16.193815	0	7	4.23635033	0.78801726
536	2015	0.09976841	0.06066791	1	16.171589	0	6	4.14614111	0.81133636
536	2014	0.06066791	0.00098551	1	16.241569	0	6	4.12983519	0.85872857
536	2013	0.13788453	0.15126251	1	16.326582	0	6	4.28153205	1.011478
536	2012	0.35714983	0.02393525	1	16.285569	0	6	4.25478466	1.36862161
537	2016	0.0024081	0.00193612	1	18.526427	0	8	4.50100649	0.02128388
537	2015	0.0023233	0.00302442	1	18.550631	0	8	4.47295028	0.02403972
537	2014	0.00382866	0.00355966	1	18.580632	0	8	4.38416967	0.02784471
537	2013	0.00624446	0.00363538	1	18.71429	0	8	4.54674535	0.02552641
537	2012	0.00858108	0.00950172	1	18.669467	0	7	4.62951772	0.03682072
538	2016	0.10852341	0.06436913	1	16.85038	1	7	3.97722955	1.45827636
538	2015	0.20865835	0.16805105	1	16.855225	1	7	3.80007645	1.54567434
538	2014	0.11125779	0.34623655	1	17.029677	1	7	3.73590397	1.63000319
538	2013	0.10383105	0.82158481	1	17.123245	1	6	3.84140818	1.7410667
538	2012	0.17480337	0.76853894	1	17.110806	1	6	3.83085512	1.5184448
539	2016	0.19861804	0.7257194	1	14.518861	0	4	3.77742075	1.70278161
539	2015	0.20836854	0.09679453	1	14.770461	0	4	3.79776406	1.87557091
539	2014	0.3021196	0.4025522	1	14.90384	0	4	3.9144588	2.22513758
539	2013	0.13974281	0.6544287	1	15.045046	0	4	4.1393363	2.40106262
539	2012	0.0646907	0.83390254	1	15.041232	0	4	4.21487653	2.37329544
540	2016	0.02410708	0.16595417	1	16.299442	1	7	4.29180871	1.27872418
540	2015	0.05363271	0.27322735	1	16.317757	1	7	4.30927166	1.26832468
540	2014	0.01563218	0.40169066	1	16.279702	1	7	4.18932829	1.44294876
540	2013	0.01955554	0.33044626	1	16.384918	1	7	4.31123142	1.41281408
540	2012	0.08361386	0.40715701	1	16.297994	1	7	4.24561362	1.42334325

541	2016	0.01015724	0.21740793	0	15.455875	0	7	4.33423139	0.81978424
541	2015	0.00822409	0.09618888	0	15.453415	0	7	4.28882003	0.93171713
541	2014	0.00951756	0.11346528	0	15.49911	0	7	4.25222377	0.93784124
541	2013	0.01020178	0.00656441	0	15.593899	0	7	4.43541246	0.87359072
541	2012	0.01253906	0.09017703	0	15.513879	0	7	4.42000049	1.03126093
542	2016	0.00342413	0.31976269	1	11.583197	0	5	3.42178663	1.05465552
542	2015	0.02762879	0.56150429	1	11.824765	0	5	3.47439267	1.07328867
542	2014	0.08802553	0.23434696	1	11.419322	0	5	3.52887096	1.17558876
542	2013	0.05905351	1.00119679	1	11.372221	0	5	3.34815466	1.11767248
542	2012	0.05791035	1.12371782	1	11.351643	0	5	3.34238381	0.62276227
543	2016	0.0676437	0.69688319	1	12.834594	1	7	4.04670798	2.64586078
543	2015	0.05915059	0.85727761	1	12.834307	1	7	3.96422904	2.68183606
543	2014	0.01212519	0.8460794	1	12.904412	1	6	3.98282791	2.64853669
543	2013	0.03407577	0.90783791	1	13.001352	1	6	4.21682757	2.60223655
543	2012	0.3926966	1.51165947	1	12.947366	1	6	4.00606028	2.85764509
544	2016	0.04109972	0.00696171	0	18.399541	0	7	4.50186496	0.41396554
544	2015	0.03734588	0.05780276	0	18.373489	0	7	4.3408922	0.32995749
544	2014	0.03792468	0.0545914	0	18.518066	0	6	4.35431157	0.27600617
544	2013	0.03769936	0.08960302	0	18.587956	0	6	4.50431792	0.27906404
544	2012	0.04698854	0.08747777	0	18.531763	0	6	4.51710353	0.32161165
545	2016	1.13939812	0.85072939	1	16.306299	1	5	4.02837989	1.99759734
545	2015	1.47052337	1.18227582	1	16.25535	1	4	4.15323908	2.48130626
545	2014	1.05835159	1.03844217	1	16.088586	1	4	3.89945208	2.42004941
545	2013	1.16464625	0.89315638	1	16.108401	1	4	4.08422693	2.32088581
545	2012	0.07133227	0.89059911	1	15.995838	1	4	4.10291969	2.62335889
546	2016	0.10669692	0.04814615	0	16.074382	1	7	4.224055	1.21607349

546	2015	0.16020205	0.09077263	0	16.005988	1	7	4.19555117	1.20448647
546	2014	0.09195091	0.14105328	0	15.976963	1	7	4.08195261	1.27816836
546	2013	0.08439078	0.29046644	0	16.000503	1	7	4.26307609	1.39041785
546	2012	0.21338247	0.40344841	0	15.758673	1	7	4.37047214	1.4121424
547	2016	0.58233852	0.12628369	1	17.915465	1	6	3.85190639	1.81830727
547	2015	0.81828885	0.44722682	1	18.000023	1	6	3.67346105	1.73907503
547	2014	0.62311895	0.52658361	1	18.228292	1	5	4.22890953	2.42263658
547	2013	1.06066844	0.76315167	1	17.856421	1	5	3.85118819	1.78770827
547	2012	1.30786974	1.05312631	1	17.799266	1	5	4.01933953	1.70258648
548	2016	1.20292996	0.69847944	1	16.212238	1	5	4.03537235	2.05641956
548	2015	0.84500309	0.529835	1	16.17127	1	5	4.07131675	2.24705642
548	2014	0.56653125	0.78370198	1	16.111865	1	5	4.27583739	2.44410714
548	2013	0.76064413	1.05488399	1	16.070345	1	5	4.3725221	2.6869539
548	2012	0.59002471	0.83809781	1	15.96534	1	5	4.30813702	2.4299639
549	2016	1.3108669	0.85118501	1	20.624586	1	6	3.93241922	2.26966327
549	2015	0.48404829	0.36011552	1	20.657931	1	6	3.93861243	2.2825035
549	2014	0.42983832	0.36109028	1	20.747924	1	6	3.91156836	2.23840405
549	2013	0.44498065	0.9383555	1	20.87727	1	6	4.05599962	2.28080267
549	2012	0.45121637	0.6880678	1	20.924455	1	6	4.11416894	2.21812519
550	2016	1.21557869	0.8299975	1	18.590118	1	6	4.22860495	2.43072427
550	2015	0.55220382	0.46435458	1	18.664383	1	6	4.14757966	2.38991085
550	2014	0.42277574	0.50561387	1	18.811785	1	6	4.12205841	2.26604309
550	2013	0.42295198	0.5563281	1	18.959172	1	6	4.25968434	2.33357704
550	2012	0.4810876	0.5101566	1	18.97877	1	6	4.30366838	2.22473176
551	2016	0.05521993	0.2671834	1	13.188985	0	6	4.31918304	2.30796191
551	2015	0.08681878	0.71161215	1	13.078466	0	6	4.03335958	2.07546477

551	2014	0.23667163	0.68261592	1	13.353348	0	6	4.04255063	1.97483755
551	2013	0.06329869	0.89515943	1	13.410569	0	6	4.69111662	2.03000691
551	2012	0.01402913	0.52829435	1	12.875061	0	6	4.40029459	1.47464904
552	2016	0.10376885	0.09826671	1	17.579623	1	6	4.49855007	0.29572464
552	2015	0.08700213	0.10292565	1	17.617637	1	7	4.58488724	0.33698639
552	2014	0.09514835	0.05917416	1	17.539242	1	7	4.50090705	0.3370949
552	2013	0.12292004	0.2170128	1	17.515667	1	6	4.58743999	0.50748666
552	2012	0.10775066	0.27181409	1	17.355018	1	6	7.46512297	0.77291908
553	2016	1.86386677	0.54468893	1	13.659163	0	6	4.19494359	3.05996572
553	2015	0.0592194	0.908569	1	13.694878	0	6	4.06979608	2.90547299
553	2014	0.04146531	0.97619227	1	13.872031	0	6	4.05477621	2.70749171
553	2013	0.36083448	0.68344628	1	13.985711	0	6	4.27427252	2.81366378
553	2012	0.95111564	0.80978022	1	13.909479	0	6	4.34595419	2.87111809
554	2016	0.00035594	0.14069976	0	14.673578	0	7	3.88478806	1.16568136
554	2015	0.00056784	0.58938428	0	14.696835	0	7	3.78254444	1.3942293
554	2014	0.00065379	0.09811624	0	14.794471	0	7	3.78827752	1.50182174
554	2013	0.00064379	0.05047256	0	14.855373	0	7	4.00492846	1.71578766
554	2012	0.0004389	1.71086842	0	14.736643	0	7	4.0673524	1.83610357
555	2016	0.00349788	0.02237285	0	15.194352	0	7	4.14237064	1.25900913
555	2015	0.00371011	0.0237468	0	15.179949	0	7	4.07760168	1.43632875
555	2014	0.00446999	0.01528164	0	15.185914	0	7	3.93546434	1.52646709
555	2013	0.00894289	0.1065594	0	15.286181	0	7	4.05389127	1.74715463
555	2012	0.00919658	0.07709344	0	15.209327	0	7	4.05546296	1.59999103
556	2016	0.00698654	0.04872159	0	15.009932	0	7	4.3276634	0.88217785
556	2015	0.00535762	0.04858157	0	15.002333	0	7	4.28638305	0.94413544
556	2014	0.01550911	0.0142352	0	15.024614	0	7	4.25853895	0.93151584

556	2013	0.01413661	0.02902468	0	15.110191	0	7	4.39577542	2.60238638
556	2012	0.03468351	0.04775534	0	15.039201	0	7	4.35631222	2.59929192
557	2016	0.03176026	0.14502978	0	14.680435	0	7	4.14968522	0.99719473
557	2015	0.00197205	0.00608942	0	14.646811	0	7	3.95678723	1.20042913
557	2014	0.00217064	0.0604166	0	14.79227	0	7	3.94171291	1.40104824
557	2013	0.00244002	0.06610417	0	14.856697	0	7	4.04116423	1.45627228
557	2012	0.00216865	0.16972674	0	14.843348	0	7	3.98609365	1.49933707
558	2016	0.01424308	0.03070863	0	14.955491	0	7	4.02532817	0.66217238
558	2015	0.01130189	0.16926418	0	14.915759	0	7	3.94051788	0.73325356
558	2014	0.03014407	0.03219803	0	14.979213	0	7	3.90234228	0.5088132
558	2013	0.01468662	0.2378824	0	15.076397	0	7	4.06606406	0.87931923
558	2012	0.00798702	0.14077447	0	15.004865	0	7	4.0230223	0.98678834
559	2016	0.00966712	0.08905429	0	15.794426	0	7	4.1266818	0.68865109
559	2015	0.00805944	0.10532351	0	15.811525	0	7	4.02365971	0.72026904
559	2014	0.01663192	0.2134479	0	15.905964	0	7	3.9739861	0.82083918
559	2013	0.00840458	0.03936493	0	16.010059	0	7	4.14867667	1.10255916
559	2012	0.01117928	0.06318792	0	15.945575	0	7	4.16401154	1.17055086
560	2016	0.09068404	0.07393796	1	17.899496	1	7	4.50930037	1.23602248
560	2015	0.0757631	0.14005147	1	17.79651	1	7	4.45668184	1.24236163
560	2014	0.07441521	0.23235856	1	17.769481	1	7	4.43415026	1.26024718
560	2013	7.7997E-05	0.52172283	1	17.810149	1	7	4.51573902	1.49379247
560	2012	0.00015499	0.26360119	1	17.761874	1	7	4.49584004	1.65658425
561	2016	0.02176247	0.05571092	0	14.297315	0	7	4.44702098	1.32579222
561	2015	0.00635278	0.11314831	0	14.277861	0	7	4.44755058	1.20865821
561	2014	0.01401237	0.09956656	0	14.23925	0	7	4.39067282	1.32370886
561	2013	0.01836532	0.14645946	0	14.251095	0	7	4.49725315	1.33560878

561	2012	0.02483504	1.05633681	0	14.158717	0	7	4.51116345	1.17151356
562	2016	0.01366619	0.01315016	0	14.831821	0	7	4.29221147	0.95428107
562	2015	0.08833317	0.04509095	0	14.826142	0	7	4.18488721	0.97648985
562	2014	0.01080442	0.03025759	0	14.906261	0	7	4.17938697	1.10960861
562	2013	0.01183865	0.0791965	0	14.979049	0	7	4.29822808	1.23188832
562	2012	0.01348566	0.30916564	0	14.926404	0	7	4.2395204	1.30239822
563	2016	0.00161969	0.13016122	0	14.579135	0	7	3.92298971	0.37504301
563	2015	0.00138105	0.17958782	0	14.609703	0	7	3.8869078	0.26585815
563	2014	0.00165862	0.18001557	0	14.646249	0	7	3.8531171	0.42789044
563	2013	0.00236121	0.32450809	0	14.738585	0	7	4.05960312	0.53652729
563	2012	0.00518056	0.65816487	0	14.629579	0	7	4.05984835	0.79413756
564	2016	0.01455949	0.022144	0	14.207615	0	7	3.6004622	0.60758167
564	2015	0.01220126	0.09093973	0	14.228412	0	7	3.55552128	0.16254733
564	2014	0.01205702	0.22841046	0	14.283981	0	7	3.55894843	0.2578997
564	2013	0.03705298	0.19966201	0	14.365716	0	7	3.7059483	0.32429048
564	2012	0.05885741	0.07344003	0	14.303345	0	7	3.71557615	0.70100721
565	2016	0.01091917	0.12056139	0	14.732368	0	7	4.3176656	0.61375218
565	2015	0.0083788	0.11641143	0	14.739063	0	7	4.29434423	0.74485451
565	2014	0.0050552	0.12256624	0	14.762377	0	7	4.26645323	0.86237717
565	2013	0.08659229	0.13963672	0	14.846067	0	7	4.45296588	1.3769352
565	2012	0.02876334	0.03969079	0	14.750564	0	7	4.42766708	1.23882051
566	2016	0.47047477	0.46704488	1	16.509905	1	7	4.42184553	1.63038655
566	2015	0.34659016	0.50208836	1	16.436211	1	7	4.26196376	1.6732336
566	2014	0.36796121	0.52549392	1	16.469014	1	7	4.16040429	1.5512595
566	2013	0.38565212	0.58830709	1	16.584183	1	7	4.27091735	1.67016643
566	2012	0.45509555	0.50827497	1	16.510025	1	7	4.24776583	1.65617588

567	2016	0.00524323	0.17023295	0	15.260878	0	7	4.32164862	0.57530464
567	2015	0.00655249	0.11192949	0	15.262245	0	7	4.24841614	0.73384949
567	2014	0.00723973	0.14836828	0	15.305124	0	7	4.21038862	0.79277892
567	2013	0.00807431	0.17507117	0	15.398056	0	6	4.31847499	1.16809109
567	2012	0.013607	0.0667676	0	15.350326	0	6	4.29415743	1.24657098
568	2016	0.0192819	0.02219486	1	18.148685	1	7	3.63604083	0.32568426
568	2015	0.02052785	0.00512584	1	18.205729	1	7	3.53575438	0.34177458
568	2014	0.01907785	0.04731479	1	18.373072	1	7	3.58860418	0.41804959
568	2013	0.03050593	0.04150464	1	18.454996	1	7	4.10311454	0.30600714
568	2012	0.03512291	0.02542893	1	18.438967	1	7	4.14041864	0.58285452
569	2016	0.01295275	0.00021698	1	17.701403	1	6	4.31850301	0.41197322
569	2015	0.01359122	0.03183388	1	17.852158	1	7	4.44505224	0.75259417
569	2014	0.03085408	0.05355783	1	17.886968	1	7	4.49616639	0.94591322
569	2013	0.05746103	0.0686236	1	17.853952	1	6	4.53212883	1.25388263
569	2012	0.11799901	0.11588078	1	17.783128	1	6	4.46818937	1.26273876
570	2016	1.41459242	0.33431563	1	16.700399	1	4	4.13557655	2.42536354
570	2015	0.11639363	0.59108234	1	16.722834	1	4	4.16339954	2.5236298
570	2014	0.25495922	0.55926258	1	16.763076	1	4	4.07255384	2.46902182
570	2013	0.14299064	0.86302455	1	16.919946	1	4	4.25705942	2.5818905
570	2012	0.19657368	0.67784875	1	16.85952	1	4	4.21724443	2.36775757

Appendix 16: Primary data.

ID	Gp	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B(AV)	C1	C2	C3	C4	C5	C(AV)	D1	D2	D3	D4	D5	D(AV)
1	2	1	0	1	1	3	2	5	2	5	5	4.25	3	4	3	4	3	3.4	4	4	2	4	3	3.4
2	2	1	1	1	2	3	0	3	4	4	4	3.75	2	4	4	2	3	3	3	2	2	2	3	2.4
3	2	1	1	0	2	1	1	4	2	5	5	4	1	5	1	1	3	2.2	5	5	5	4	4	4.6
4	2	1	0	2	2	3	2	4	4	4	5	4.25	3	4	3	3	2	3	3	3	3	4	2	3
5	2	1	0	2	2	3	0	4	4	4	4	4	2	4	4	2	2	2.8	4	4	4	4	2	3.6
6	2	1	0	0	2	1	1	2	2	3	2	2.25	3	3	3	3	3	3	3	3	3	3	3	3
7	2	1	0	1	2	3	0	5	5	2	5	4.25	2	4	2	1	4	2.6	3	5	4	5	4	4.2
8	2	1	0	0	1	1	0	2	4	4	2	3	3	3	3	3	3	3	4	4	2	4	4	3.6
9	2	1	0	0	1	2	2	2	2	4	4	3	4	2	4	4	4	3.6	2	4	2	3	4	3
10	2	1	0	0	2	1	2	1	2	2	4	2.25	4	4	3	4	2	3.4	4	4	4	5	2	3.8
11	2	1	0	1	2	2	1	2	2	2	1	1.75	1	1	2	1	1	1.2	1	1	1	1	1	1
12	2	1	0	0	1	1	0	2	2	4	2	2.5	2	3	4	4	2	3	2	4	2	4	1	2.6
13	2	1	0	2	2	3	0	2	2	4	3	2.75	3	3	3	3	3	3	3	3	3	3	3	3
14	2	1	0	1	0	3	0	2	2	2	4	2.5	3	3	3	3	4	3.2	4	4	2	4	4	3.6
15	3	1	0	2	1	3	0	2	1	2	4	2.25	2	2	2	2	2	2	3	4	4	4	4	3.8
16	2	1	0	1	2	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
17	1	0	1	2	2	3	1	4	2	4	4	3.5	3	3	3	3	3	3	3	3	3	3	3	3
18	2	1	0	1	4	2	0	1	1	2	5	2.25	3	3	2	3	3	2.8	3	3	3	3	3	3
19	2	1	0	1	3	3	1	2	2	2	4	2.5	4	4	3	4	3	3.6	2	4	2	3	3	2.8

20	1	0	0	1	3	0	0	2	1	2	2	1.75	3	3	3	3	3	3	2	2	2	2	2	2
21	1	0	0	1	4	1	0	2	4	4	4	3.5	2	3	3	3	3	2.8	3	3	3	4	2	3
22	2	1	0	2	2	3	2	2	2	4	4	3	4	4	4	4	4	4	4	4	4	2	4	3.6
23	2	1	0	0	4	1	1	4	4	2	4	3.5	2	2	3	3	2	2.4	3	3	3	3	3	3
24	2	1	0	2	3	2	1	2	2	2	3	2.25	3	3	3	3	4	3.2	3	3	3	3	4	3.2
25	2	1	0	1	1	3	1	2	4	4	4	3.5	2	4	4	4	4	3.6	3	3	3	3	3	3
26	2	1	0	1	2	2	0	1	3	4	4	3	4	4	3	4	4	3.8	4	5	2	4	4	3.8
27	2	1	0	1	2	3	1	4	4	5	5	4.5	3	3	2	3	3	2.8	1	4	4	2	4	3
28	3	1	0	1	3	2	1	2	4	2	4	3	4	4	4	4	3	3.8	4	5	2	4	4	3.8
29	2	1	0	1	2	3	0	1	4	2	5	3	4	4	4	4	5	4.2	1	4	1	1	5	2.4
30	3	1	0	2	4	3	0	4	2	5	5	4	1	2	4	2	4	2.6	2	5	4	2	4	3.4
31	2	1	0	1	1	3	0	2	2	2	3	2.25	4	4	3	4	4	3.8	3	4	2	2	4	3
32	2	1	0	2	2	3	0	3	3	4	4	3.5	2	4	4	2	4	3.2	4	5	1	4	2	3.2
33	3	1	0	2	2	3	0	3	5	5	3	4	3	4	4	3	4	3.6	4	3	4	4	4	3.8
34	2	1	0	2	2	3	2	2	4	2	4	3	3	2	2	4	4	3	2	4	2	2	4	2.8
35	3	1	0	3	1	3	0	2	4	5	4	3.75	2	5	5	3	4	3.8	4	4	2	4	4	3.6
36	2	1	0	2	4	3	0	4	4	5	4	4.25	2	2	4	4	4	3.2	4	4	2	5	4	3.8
37	2	1	0	1	4	2	0	1	3	3	4	2.75	4	4	3	4	2	3.4	2	4	2	4	2	2.8
38	3	1	0	2	1	3	0	1	5	4	5	3.75	1	4	3	2	3	2.6	2	3	2	4	4	3
39	2	1	1	2	2	3	0	2	2	2	2	2	2	2	2	2	4	2.4	2	2	2	2	2	2
40	3	1	1	0	3	1	0	3	5	4	4	4	1	2	2	1	4	2	4	5	2	4	4	3.8
41	2	1	0	0	2	2	0	2	1	2	4	2.25	3	4	4	2	5	3.6	3	2	2	2	4	2.6
42	3	1	1	2	4	3	0	4	2	5	5	4	4	5	4	3	4	4	5	5	4	4	4	4.4
43	2	1	0	3	1	3	0	1	2	2	4	2.25	3	3	3	3	4	3.2	2	3	2	2	4	2.6

44	2	1	0	2	2	3	2	2	2	2	4	2.5	4	4	4	4	4	4	2	2	2	2	3	2.2
45	2	1	0	2	4	3	1	2	4	4	4	3.5	2	3	2	3	3	2.6	2	3	2	2	4	2.6
46	2	1	0	1	4	3	0	4	3	5	4	4	4	4	3	4	4	3.8	3	3	2	4	4	3.2
47	2	1	0	1	1	3	1	2	4	2	4	3	2	3	2	4	3	2.8	3	2	2	4	3	2.8
48	2	1	0	1	2	2	0	2	2	2	2	2	2	1	3	3	2	2.2	4	4	4	4	3	3.8
49	2	1	0	0	2	1	2	2	2	4	4	3	2	4	3	4	3	3.2	3	2	3	3	3	2.8
50	3	1	0	2	1	3	0	2	5	5	4	4	1	5	5	1	4	3.2	3	4	1	4	4	3.2
51	1	0	0	1	3	3	0	1	2	2	2	1.75	2	2	3	3	4	2.8	2	2	2	3	3	2.4
52	1	0	0	3	2	1	1	3	3	2	3	2.75	2	4	4	4	3	3.4	4	2	2	4	2	2.8
53	1	0	0	0	3	1	1	1	4	4	1	2.5	3	3	3	3	3	3	2	3	2	2	3	2.4
54	1	0	0	2	3	3	1	2	4	2	4	3	2	2	2	2	3	2.2	2	2	3	3	2	2.4
55	1	0	0	2	3	0	0	2	2	1	4	2.25	3	3	3	3	3	3	3	3	3	3	3	3
56	1	0	1	1	3	1	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
57	2	1	0	1	2	2	2	3	2	4	4	3.25	2	4	3	2	2	2.6	3	4	2	4	4	3.4
58	2	1	0	1	2	2	2	1	5	4	4	3.5	2	2	3	4	4	3	3	2	3	4	4	3.2
59	1	0	0	1	3	2	1	1	2	2	1	1.5	2	3	2	1	1	1.8	3	2	3	3	2	2.6
60	3	0	1	0	2	0	0	4	4	5	3	4	2	4	3	1	4	2.8	3	4	2	3	4	3.2
61	1	0	0	2	3	1	0	4	4	4	4	4	4	4	4	4	2	3.6	2	4	2	4	2	2.8
62	1	0	0	3	3	3	2	1	1	4	2	2	3	3	3	3	3	3	3	3	3	3	3	3
63	1	0	2	3	2	3	1	1	1	3	4	2.25	1	2	2	2	2	1.8	2	2	2	2	2	2
64	1	0	1	0	2	1	1	3	2	4	4	3.25	4	4	3	4	4	3.8	4	4	5	3	4	4
65	3	1	0	3	4	3	0	4	4	5	5	4.5	4	3	4	4	3	3.6	4	3	1	4	4	3.2
66	1	0	0	1	3	0	0	2	1	2	3	2	2	2	2	3	2	2.2	2	2	2	2	2	2
67	1	0	0	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

68	1	0	0	0	3	0	0	2	3	2	4	2.75	3	2	3	4	3	3	4	4	2	4	4	3.6
69	1	0	0	1	3	1	0	1	2	2	4	2.25	3	4	4	4	4	3.8	3	3	3	4	4	3.4
70	1	0	0	1	3	3	1	2	2	1	3	2	2	1	4	4	2	2.6	4	4	2	3	2	3
71	1	0	0	1	3	2	0	2	4	4	4	3.5	3	3	3	3	3	3	3	3	2	4	2	2.8
72	1	0	1	2	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
73	1	0	0	1	3	0	0	2	2	4	3	2.75	2	1	5	1	1	2	4	3	4	2	3	3.2
74	1	0	0	2	4	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
75	1	0	0	2	3	1	1	1	1	1	2	1.25	3	4	4	3	4	3.6	2	4	2	2	2	2.4
76	1	0	0	3	3	1	0	4	2	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3.6
77	1	0	0	2	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
78	1	0	1	1	3	1	1	2	2	4	4	3	4	4	4	4	4	4	4	3	2	4	3	3.2
79	1	0	0	1	3	1	1	1	1	3	4	2.25	3	2	2	2	3	2.4	2	2	4	3	3	2.8
80	2	1	0	3	2	3	0	1	1	4	4	2.5	5	5	5	5	4	4.8	3	3	1	5	5	3.4
81	1	0	0	2	4	3	1	4	4	4	4	4	1	2	2	2	3	2	2	2	2	4	3	2.6
82	1	0	0	3	3	0	0	4	2	4	4	3.5	4	4	4	4	3	3.8	3	4	4	4	3	3.6
83	3	0	0	1	3	1	0	4	2	1	4	2.75	4	4	4	3	3	3.6	2	3	2	3	3	2.6
84	1	0	0	3	2	2	0	4	2	4	4	3.5	4	4	4	4	4	4	4	4	2	1	4	3
85	1	0	1	3	3	2	0	3	2	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3
86	1	0	1	1	3	2	0	2	2	2	2	2	3	3	3	3	2	2.8	4	4	2	2	4	3.2
87	1	0	0	1	3	1	0	2	4	4	4	3.5	2	4	2	2	4	2.8	2	4	2	3	4	3
88	1	0	0	2	3	3	0	4	2	4	4	3.5	2	5	4	2	3	3.2	2	4	4	4	4	3.6
89	1	0	0	2	3	3	1	2	2	4	4	3	2	2	2	4	4	2.8	3	3	4	4	4	3.6
90	1	0	0	1	3	1	2	1	2	2	1	1.5	2	4	3	2	2	2.6	2	2	3	2	1	2
91	1	0	0	2	2	1	0	3	3	4	4	3.5	3	3	3	3	3	3	3	3	3	3	3	3

92	1	0	0	1	3	0	0	2	4	3	2	2.75	2	2	3	3	4	2.8	4	3	2	2	4	3
93	3	0	0	3	4	3	0	1	1	1	4	1.75	2	5	2	1	3	2.6	2	2	1	4	2	2.2
94	1	0	0	1	3	0	0	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	3.4
95	1	0	0	1	3	1	0	1	4	5	4	3.5	2	3	2	1	2	2	2	2	2	3	4	2.6
96	1	0	0	3	4	3	0	2	2	4	4	3	3	3	3	3	3	3	4	4	2	2	3	3
97	3	0	0	3	3	3	1	4	4	4	4	4	1	1	2	2	2	1.6	2	3	2	4	4	3
98	1	0	0	2	3	3	1	2	2	3	2	2.25	2	2	4	2	2	2.4	2	4	2	2	2	2.4
99	1	0	0	1	2	0	0	4	4	4	4	4	2	1	2	2	4	2.2	3	4	2	2	2	2.6
100	1	0	0	1	3	0	1	4	4	4	4	4	2	2	2	2	1	1.8	4	4	2	2	4	3.2
101	1	0	0	3	3	3	2	2	2	4	2	2.5	3	3	3	3	3	3	3	3	3	3	3	3
102	1	0	1	3	1	3	2	4	4	4	4	4	2	4	4	2	4	3.2	5	5	2	4	2	3.6
103	1	0	1	1	3	0	0	2	2	2	2	2	3	2	2	2	2	2.2	3	4	4	4	4	3.8
104	1	0	1	2	3	3	0	2	4	2	4	3	2	2	4	4	4	3.2	3	4	2	3	4	3.2
105	1	0	1	2	3	1	0	3	3	4	4	3.5	3	3	3	3	3	3	3	3	3	3	3	3
106	1	0	0	3	3	0	0	4	2	4	4	3.5	3	4	3	3	3	3.2	4	3	3	4	3	3.4
107	1	0	0	3	3	0	0	3	3	3	3	3	3	5	3	3	3	3.4	4	3	3	3	3	3.2