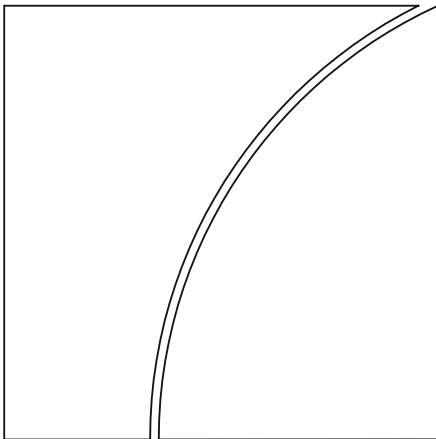Basel Committee
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Working Paper 31

The interplay of accounting and regulation and its impact on bank behaviour

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Contents

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List of abbreviations

AEG	Accounting Experts Group of the Basel Committee on Banking Supervision
AFS	Available for sale
BCBS	Basel Committee on Banking Supervision
BRSS	Bank Regulation and Supervision Survey conducted by the World Bank
CET1	Common Equity Tier 1
CDO	Collateralised debt obligation
CDS	Credit default swap
EU	European Union
FSB	Financial Stability Board
G20	Group of Twenty
GAAP	Generally accepted accounting principles
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
NPL	Non-performing loans
OECD	Organisation for Economic Co-operation and Development
OCI	Other comprehensive income
RAP	Regulatory accounting principles
RTF	Research Task Force of the Basel Committee on Banking Supervision
S&L	Savings and loan associations
SNC	Shared National Credit
SIV	Structured investment vehicle
TLAC	Total Loss Absorbing Capacity
WTO	World Trade Organization

1.   Introduction

Accounting rules and disclosure standards are important determinants for banks' incentives and behaviour, and the recent financial crisis, where criticism was voiced (eg regarding the role of fair value accounting of financial assets and incurred loss provisioning of loans), is just another example of the importance and relevance of banks' financial reporting in a regulatory and supervisory context.

In March 2013, the Basel Committee's Research Task Force (RTF) initiated a new work stream (RTF-RA) that deals with aspects of the interplay of accounting and regulation and its impact on bank behaviour from a research perspective. At the same time, groups like the Accounting Experts Group (AEG) and other bodies continued to work on specific policy decisions on accounting issues from a regulatory policy perspective. Specifically, the RTF-RA work stream was tasked to "*identify ways in which the interaction between accounting and regulatory rules provides incentives that affect the risk taking of financial institutions*", and it commenced research on specific aspects of loan loss provisioning, disclosure rules, fair value accounting, and prudential filters.

The aforementioned topics should be explored from an economic perspective but conditioned by the current accounting framework that applies to financial institutions. Given this perspective, the RTF-RA work stream does not recommend changes in accounting rules or in accounting-related regulatory instruments. Instead, it is aimed at conducting an economic analysis of the mechanisms at play, and the associated implications for bank behaviour. However, the outcome of this research may be informative for policymakers if observed in the context of the broader academic literature and if combined with relevant practical experiences.

This report summarises the RTF-RA work stream's findings, which were prepared by individual members and discussed at six internal meetings. A members list is provided above. It is important to note that most of this research is still preliminary, and that many members will continue to work on their analyses and conclusions. In some cases, further research is clearly warranted, hence policy conclusions based on the evidence presented in this report should not be drawn without further research and supplementary analysis. A brief summary of individual contributions together with the specific research questions addressed can also be found in the appendix.

This report is not the only observable output of the RTF-RA work stream. In October 2014, it organised a joint academic workshop hosted by Deutsche Bundesbank and the RTF, where members discussed their own research with representatives of universities, policy institutions and the industry. Further, in January 2015, the RTF-RA published a literature review (BCBS (2015b)) that presents prior findings of academic research. Both documents are meant as reference documents for policy makers, supervisors, accountants and researchers.

Section 2 provides some background how regulation and accounting of financial institutions intertwined in the past, in particular with respect to the globalisation of banking services, financial innovation processes and the experience of financial crises. It is different from the presentation of other projects in that it does not present original empirical research but rather insights on these aspects from an academic researcher's perspective.

Section 3 presents the findings from the work stream's projects in a compressed manner. All projects are empirical in nature, and they analyse data from various jurisdictions (cf Annex 2). In Section 3.1, the timeliness, adequacy and cyclicality of banks' loan loss provisions are addressed, while Section 3.2 focuses on fair value accounting in three different contexts: market discipline, contagion risk and prudential filters. Research questions and respective findings are summarised in the following table.

Section	Research question	Empirical findings
3.1	*Loan loss provisioning models, banks' practices and procyclicality*	
3.1.1	Are banks' loan loss provisioning policies timely and adequate?	Provisioning choices of banks depend to a large extent on backward-looking factors (eg NPL ratios, spreads at origination) questioning their timeliness and adequacy.
3.1.2	Does banks' loan loss provisioning have a cyclical element?	No clear evidence. Aside from the backward-looking factors above, discretionary provisions in some countries tend to increase as macroeconomic conditions deteriorate, while other analyses cannot find this effect.
3.1.3	How do earnings and capital management incentives influence banks' provisioning decisions?	The importance of earnings management incentives for provisioning decisions has been documented by several analyses, whereas the management of regulatory capital seems to be a somewhat less significant factor.
3.1.4	Do backward-looking provisioning rules amplify the procyclicality of lending?	A cross-jurisdictional analysis shows that banks which are subject to more backward-looking provisioning rules tend to contract their lending more strongly during economic downturns.
3.2	*Fair value accounting from a perspective of markets and regulators*	
3.2.2	Do banks' capital ratios differ according to the degree to which they are exposed to market discipline?	Banks with higher exposure to market discipline either in the form of reliance on subordinated debt or being listed on a US exchange hold higher capital ratios.
	How is banks' discretion in how they measure assets with no readily observable market prices associated with their capital ratios?	Banks' capital ratios and the amount of Level 3 assets on their balance sheets are negatively associated. However, exposure to market discipline dampens this effect.
	Does this relationship depend on economic conditions or market sentiment?	Market discipline appears to be more effective during economic downturns and more volatile market phases, and less effective during more benign conditions.
3.2.3	Through which channel (direct or indirect links, common exposures or accounting similarities) did contagion risk spread during the recent crisis?	No clear evidence for the hypothesis that the designation of assets at fair value led to contagion among large, systemically important banks. Exposures to common risks and investors' uncertainty about banks' structured portfolio investments were more important.
3.2.4	How does the so called neutralisation approach, in the context of prudential filters, by which neither unrealised gains nor losses in relation to debt instruments are included in capital ratios, affect the size of the available for sale (AFS) portfolio and regulatory capital ratio buffers?	Fluctuations in banks' capital ratios would have been larger without the prudential filter for gains and losses in the AFS portfolio. Further, if both gains and losses on AFS assets are neutralised in banks' regulatory capital, they tend to hold relatively more AFS assets. However, capital buffers have historically been highest if gains were recognised as capital.

In summary, the results described in this report as well as the conclusions from other studies reported in BCBS (2015b) suggest that both in the context of loan loss provisioning and the valuation of banks' assets, there is a tension between backward-looking and forward-looking measurement. This observation is also consistent with the mixed picture that is given by the analytical results regarding several research questions. One conclusion is that *corner solutions* in one or the other direction do not seem optimal, and that an adequate mix of the two concepts may be superior. The other conclusion is that further evidence on the research questions posed is clearly needed. For example, all of our projects focus on quantities, but not on prices of financial instruments (eg loan rates or yields of securities). Therefore, researchers are encouraged to further address the interplay of accounting and regulation and its impact on bank behaviour from an academic perspective.

2. Accounting standards, banking regulation and bank behaviour

This section gives an overview of the role of prudential regulation and accounting in relation to bank behaviour. It also describes broader trends influencing banks before the 2008 crisis. Relevant literature is cited, but the section is not intended to be a literature review.[1] The aim is to provide a backdrop for the specific analyses summarized in Section 3.

Banking crises may be seen as a result of excessive risk-taking by banks. Even though each crisis has its own characteristics, the development of crises seems to follow similar patterns: (i) weaknesses are built into the financial system, (ii) some event makes the weakness explicit, (iii) the crisis spreads through contagion and (iv) resolution measures are applied. After resolution measures have been applied, there is usually a prolonged recovery phase before the real economy is back on a normal trajectory (Ingves and Lind (2009)).

Which weaknesses were built into the financial system when the problems first emerged in the US subprime market in 2007 and more broadly in the financial markets in 2008? In November 2008, the G20 countries summarised the root causes of the crisis (G20 (2008)):

"During a period of strong global growth, growing capital flows, and prolonged stability earlier this decade, market participants sought higher yields without an adequate appreciation of the risks and failed to exercise proper due diligence. At the same time, weak underwriting standards, unsound risk management practices, increasingly complex and opaque financial products, and consequent excessive leverage combined to create vulnerabilities in the system. Policymakers, regulators and supervisors, in some advanced countries, did not adequately appreciate and address the risks building up in financial markets, keep pace with financial innovation, or take into account the systemic ramifications of domestic regulatory actions."

Even though considerable work has been done since 2008 to address the weaknesses present at the time, it is of interest to revisit the evaluation made by the G20 and to examine how the financial system had evolved during the preceding years. Several points in the G20 declaration are worth noting. First, the declaration states that (some) policymakers, regulators and supervisors were not ahead of events. The observation that regulators seem to be "behind the curve" may be expected when bank behaviour and the regulatory process are endogenous to each other (Llewellyn (2011)). If banks seek to circumvent regulation, they may invest in financial innovation and change the way they conduct business. In particular, risk seemed to move to places where regulation is weak (Haldane (2010)). Generally, this response from banks leads to new regulation, and the process of circumvention and regulatory change may continue. In this perspective, regulation and regulatory changes may be considered as one of the forces shaping developments in the financial system.

Second, the G20 declaration refers to complex and opaque financial products. This issue points to the trends of financial innovation and securitisation that had been ongoing for decades. These trends did, however, change pace and character (involving complex structures linked to subprime loans in the US) a few years before the crisis. Interestingly, the G20 countries called upon global accounting standard bodies to "... enhance guidelines for the valuation of securities, also taking into account the valuation of complex, illiquid products, especially during times of stress" (G20 (2008)). In particular, the measurement of complex securities in illiquid markets at fair value was considered to be problematic. Further, the G20 countries stated that accounting standard setters should "... significantly advance their work to address weaknesses in accounting and disclosure standards for off-balance sheet vehicles", which includes securitisation exposures that were partly held off-balance sheet. These two examples show that accounting

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[1] BCBS (2015b) reviews relevant literature.

standards were considered to be important characteristics of the financial system at the time and that it was seen as important to consider the role of accounting standards when solving the crisis.

Finally, the fact that the G20 countries met to discuss the 2008 crisis showed the global character of this event. Increased trade and integration had taken place together with an internationalisation of banking and the emergence of global financial markets, which was widely seen as a positive development, eg due to the ability for individuals and countries to share risk. The financial system was, however, also efficient in transmitting shocks between countries (Gieve (2006)).

While banking regulation, as the name implies, is directly related to banks, accounting standards apply to firms in general (including banks). Mandatory accounting standards and disclosure rules shall secure transparency about the financial performance and standing of firms. Prudential bank regulation shall secure the safety and solvency of banks. Both banking regulation and accounting standards mitigate the negative effect of information asymmetry and help debt and equity investors when they are deciding to provide financing for banks.

The rest of this section is organised as follows. Section 2.1 presents the objectives of banking regulation and accounting standards and gives a brief overview of the arguments underpinning the rationale for the regulation. Section 2.2 provides a stylised description of banks' objective and the role of regulation and accounting. Section 2.3 describes important trends shaping the financial system during the decades before the crisis and Section 2.4 summarises.

2.1 Objectives and rationale for prudential regulation and accounting standards

The negative consequences of market failure provide a main justification of regulatory interventions – also in the financial sector. Considering the latter, market failure comprises financial instability on the system level which may be caused by information asymmetries or negative externalities. The objective of prudential banking regulation[2] is thus (i) to sustain systemic stability, (ii) to maintain the safety and soundness of individual banks, and (iii) to protect customers (Llewellyn (1999)).

Banks play a crucial role in the financial sector and therefore also for the real sector. There are two theoretical approaches to explaining the existence of banks that both build on information asymmetries between depositors (households) and borrowers (firms). Diamond (1984) argues that banks function as a delegated monitor if firms have private information about their investments. Bryant (1980) as well as Diamond and Dybvig (1983) show that banks are beneficial in insuring depositors against illiquidity if banks have private information about their liquidity needs. In both cases banks create wealth by reducing transaction costs for market participants (Bhattacharya and Thakor (1993)).

However, their specific business structure also implies that banks are prone to bank runs. For instance, anticipating an illiquidity problem, depositors may withdraw their funds prematurely in order to minimise potential losses (Diamond and Dybvig (1983)). Banks take into account potential risks at the individual level when making their decisions. However, from this perspective, they do not consider the overall impact of their own default on the economy. Hence, the economic rationale for banking regulation is to prevent those defaults that are welfare reducing. That implies that regulation will be justified as long as the resulting social benefits exceed the social costs that may result from market inefficiencies (Llewellyn (1999)).

Although banks reduce information asymmetries between households and firms, their existence generates new information asymmetries between banks and depositors. According to the principal-agent theory, information asymmetries may induce adverse selection and moral hazard. Adverse selection occurs when less informed market participants avoid making transactions with better informed participants (Akerlof (1970)). The concept of moral hazard holds that the agent (the bank management) is incentivised

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[2]   In contrast, conduct of business regulation focuses on how banks conduct business with their customers.

to make decisions that are not optimal for the principal (the bank owners) (Holmström (1979)). Compensation schemes are particularly important when aligning bank managers' risk taking incentives to those of the shareholders. Excessive risk taking may increase reported profitability in the short run while losses are observed after a long period of time. It is therefore desirable that parts of the compensation are deferred in order to evaluate better the outcome of the risk taking.[3]

In a stable environment, ie an environment where one may benchmark against previous periods, trust between banks and its stakeholders may be built through comparing banks' performance against the performance in previous periods. This may in itself limit the problem of information asymmetry. If banks' business environment is changing, eg through liberalisation of competition, through innovation in financial markets or through reduced supervision, information asymmetry may increase. Informed market participants observe how competition and risk taking change, while less informed participants find comparisons with prior periods less useful. The representation hypothesis therefore regards regulation as beneficial if unsophisticated investors bear high risks (Dewatripont and Tirole (1994)). In that case regulation will reduce information asymmetries and thus one source of market failure.

Negative externalities are another relevant cause of market failure in a financial system and therefore constitute a second argument in favour of regulatory intervention. The default of an individual bank may adversely affect several other parties and stakeholders. First, in the absence of deposit insurance, depositors suffer from losing their deposits. Second, banks may be linked directly by business relations as well as indirectly by operating in the same markets, eg the interbank market or asset markets. Both linkages might constitute a channel of contagion, ie the default of a single institution might trigger the default of other banks.[4] Third, financial distress may affect the real sector. Banks might try to prevent a default by liquidating assets pre-emptively. If this leads to a funding shortfall for firms, aggregate supply may decline (Freixas and Rochet (1997)). Moreover, firms may face difficulties in receiving new funding during financial crises. Analyses on recent financial crises costs indicate a cumulative decline in GDP of 9–20% on average (Hoggarth et al (2002), Reinhart and Rogoff (2009)).

During the last decade, the objective of prudential regulation has been extended. It not only considers banks but financial institutions in general, as they are likewise capable of inducing financial instability. Financial institutions are increasingly interconnected across borders. Moreover, several hybrid forms of both financial institutions and financial instruments emerged and business models have changed. Banking regulation thus has to take into account the interdependencies between banking, insurance and capital markets (Herring and Schmidt (2011)).

Due to the developments in financial markets, macroprudential regulation gains importance to complement traditional microprudential regulation. Microprudential regulation, which focuses on the safety and soundness of an individual financial institution, was found to be less effective with respect to systemic risk. Macroprudential regulation, therefore, is concerned about the well-being of the financial system as a whole and aims to reduce credit volatility and contagion effects (Tarullo (2014)).

The objective of financial reporting[5] is to provide decision relevant information to agents dealing with the firm. In the Conceptual Framework for International Financial Reporting Standards (IFRS), the objective is described as follows (IASB (2008)):

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[3]   See Principle 11: Compensation in BCBS (2015).

[4]   See eg Allen and Gale (2000), Freixas et al (2000), Dasgupta (2004), Hasman and Samartín (2008), Brunnermeier and Petersen (2009) as well as Gai and Kapadia (2010) for analyses of different contagion channels. Acharya (2009) shows that financial institutions may also default simultaneously if they are hit by a common shock.

[5]   By the term "accounting" we mean general purpose financial accounting. One may discern between several types of accounting, see, eg King (2006). Other types of accounting are tax accounting, cost accounting and statutory accounting. The latter is statements (or accounts) used by regulatory bodies and used to, eg, compute capital adequacy ratios.

"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 about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit."

As we see it, the objectives of prudential regulation and financial reporting differ in parts. Banks' debt providers are primarily interested in the repayment of their money. Their main concern is therefore the solvency and soundness of banks. Moreover, equity investors are interested in future expected dividend payments. In other words, debt holders focus on "downside risk" while stockholders focus also on "upside potential". The objective of prudential regulation and the interest of debt investors are similar in the sense that it is the survival of the bank (firm) that is of primary interest.

While the objectives of prudential regulation and financial reporting diverge, there are similarities in the economic rationale for the two. According to Llewellyn (1999), the economic rationale is the justification, based on economic criteria, why mandatory rules are necessary to achieve the objectives. The similarity is partly based on the unregulated market outcome caused by the opaqueness of the value of the firm to outside investors. For banks, the opaqueness causes uncertainty about whether the bank is solvent, which may at worst result in a run on the bank. Opaqueness also explains why the liquidation value of assets is lower than the going concern value of assets. This may trigger a solvent bank becoming insolvent if it needs to liquidate assets so serve the redemption from depositors during a run.

Financial reports may reduce the opaqueness, or information asymmetry.[6] The information asymmetry between informed and uninformed investors may reduce market liquidity and increase firms' cost of capital. A reduction in opaqueness may also change management's decisions and reduce the principal-agent problem.

2.2   Banks' objective and the effect of regulation and accounting standards

The objective function of banks may serve as a starting point for organising thoughts on how accounting standards and banking regulation influence bank behaviour. A common assumption is that banks' objective (as other private firms' objective) is to maximise the market value of equity. Banking regulation imposes restrictions on banks' behaviour, particularly on the risk-taking of banks. Similarly, accounting standards impose rules on how banks shall determine and disclose information about their financial standing and performance. Banks make decisions to achieve their objective within the constraints set by the two sets of rules.

Prudential capital regulation for banks puts limits on the maximum level of risk that banks can be exposed to relative to the level of capital they hold. These quantitative regulatory ratios reflect the minimum level of capital banks are expected to hold, and these rules are designed to secure a high probability that banks survive a severe economic downturn. Authorities monitor whether banks comply with these regulatory requirements. In addition to monitoring compliance with quantitative requirements, authorities also observe (through supervision[7]) banks' behaviour and risk-taking in order to secure the safety and soundness of banks. Supervisors may use banks' public financial reporting, but they also have access to regulatory reporting from banks. Such regulatory reporting is partly confidential to supervisors and may, among other things, contain detailed information about banks' risk exposures.

Accounting standards may influence bank behaviour in several ways. First, accounting standards influence bank behaviour directly through disclosure to debt and equity investors and by allowing benchmarking between banks. Transparency may reduce the problem of information asymmetry between

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[6]   Leuz and Wysocki (2008) discuss the economic rationale for financial reporting and disclosure.

[7]   This distinction between the terms "monitoring" and "supervision" is based on Llewellyn (1999).

informed and uninformed investors and may also reduce the agency problem (Barth et al (2004), Caprio et al (2008) and Carvajal et al (2009)).

Second, accounting standards may influence banks indirectly through the effect they have on quantitative regulatory requirements, such as the minimum capital ratio. An example is book equity, which is an important element of regulatory capital. In some cases, prudential filters have been applied to correct for the undesired consequences of using accounting numbers directly.[8]

Third, accounting standards may also influence banks indirectly through the impact financial statements have on the supervision of banks, ie the role of financial statements on the broader evaluation of safety and soundness of banks. It may be difficult for supervisors to curb excessive risk-taking when banks seem healthy and report high book returns (FDIC (1997, p 84)). There may, however, be problems with relying to a large degree on banks' financial statements when evaluating the stability of individual banks or the financial system (Borio and Tsatsaronis (2005, 2006)). The problems are particularly related to the measurement of risk and to measurement errors (ie "the risk of risk measures"). Aggregation of bank-specific information when performing sector or economy-wide evaluations is another problem. In particular supervisors should bear in mind the different users of financial statements (eg equity and debt investors, financial analysts, suppliers, customers, employees and the general public) and consider that interests of these stakeholders are not necessarily aligned with supervisory information needs. The fact that accounting rules have not specifically been designed to satisfy supervisors justifies regulatory reporting deviating from accounting figures.

Furthermore, even though the disclosure of financial information helps reducing information asymmetry, the users of this information, such as investors, financial analysts and supervisors, know that accounting standards give the preparers of financial statements some flexibility to represent judgements and estimates when presenting the financial standing and performance of firms. This flexibility gives management the possibility to manage the numbers presented in financial statements. Users may suspect that the preparers have used their discretion to increase the profit and the net worth of the bank. The basic assumption underlying management's incentive for window-dressing is, however, that the users do not know that the financial statements have been managed.

A bank group is a bank (company) with wholly or partly owned subsidiaries. The usefulness of financial reporting for a bank group critically depends on proper consolidation of the companies in the group. One of the concerns related to financial stability is too high debt levels in banks. Off-balance sheet financing may be used to reduce reported debt levels.

In the non-financial sector, the well-known case of Enron involved off-balance sheet financing and fraud. Enron did not consolidate debt in single-purpose entities, thereby hiding aggregated debt levels at the group or consolidated level. Another method to (lawfully) lower reported debt was used by Lehman Brothers through "Repo 105" transactions. These transactions involved selling assets to a lender and at the same time agreeing to buy the assets back at a later date (repurchase agreement). The assets were removed from Lehman's balance sheet and the "proceeds" from the sale were used to repay debt. At the buyback date, Lehman Brothers increased the debt level and bought back the assets. The result of these Repo 105 transactions was lower debt levels at reporting dates. Already in the 1992–1997 Japanese banking crisis, the lack of proper consolidation rules played a negative role (Kanaya and Woo (2000)). Related companies were used to clean up banks' balance sheets through the sale of bad loans, but without consolidating the related companies. Banks then appeared to be in a better shape than they actually were.

Loan losses are perhaps the single most important entry in the profit and loss account of banks involved in traditional deposit-taking and lending. Banks may have incentives to delay and underreport losses in order to delay and possibly avoid negative price responses in equity and debt markets. The development in loan losses is also closely followed by supervisors. Delayed loss reporting has featured in

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[8]   Section 3.2.4 gives more details of prudential filters and presents a research project on their functionalities.

many banking crises. Kanaya and Woo (2000) argue that during the 1992–1997 Japanese banking crisis, the loan classification rules were too lax and that it therefore took too much time to recognise the extent of non-performing loans. Reporting of loan losses may, on the other hand, be criticised because they seem to be too high in the run-up to a crisis. During the 1987–1993 Norwegian banking crisis it was claimed that the loss recognition rules caused a higher than necessary reporting of losses, thereby contributing negatively to the development of the crisis. The commission investigating the crisis did, however, not support this view (Moe (2004)).

According to Jones (2013) there are three broad categories (excluding the fraud category) of incentives for management to perform window-dressing. First, management may want to present high profits to increase salaries, bonuses and remuneration through stock and stock options. This category is labelled personal incentives.

The second category includes the incentives to manage the accounts as to meet analysts' expectations. If earnings are below analysts' estimates, the stock price is likely to fall. Managers may also want to smooth earnings over time. This gives the impression that the performance of the bank is steadily increasing and that the bank is well run. Profit-smoothing also gives the impression that the risk related to the bank's performance is lower than would have been the case without profit smoothing. A low volatility in reported earnings makes future earnings easier to predict.

The third category includes cases where financial statements are managed under specific circumstances. One such circumstance is to decrease the regulatory visibility by not reporting high profits, which may lead to regulatory intervention because of the associated risk. Other circumstances may be to manage the equity ratio so that loan covenants are not breached, to increase profit in relation to takeovers or to increase profit in "bad times" while hoping for improved future improvements in the business environment. For banks, this category covers the management of accounting numbers with consequences for the regulatory capital ratio.

While banks have incentives to perform window-dressing, authorities may also change regulation and accounting standards before or during crises. Banking crises are always evaluated ex post to establish the causes of the crises and to evaluate the role of authorities, supervisors and banks. Regulatory authorities and prudential supervisors have been criticised on the ground that they did not take timely action to correct negative developments, thereby allowing negative developments to go too far and eventually turning into systemic crises. Authorities' inaction and procrastination are often referred to as regulatory forbearance.

Two examples are the 1992–1997 Japanese banking crisis and the 1984–1991 savings and loans (S&L) crisis in the United States. In Japan, banks were allowed to change valuation principles from the "lower-of-cost-or-market" principle to the cost principle for equity securities held for investment purposes (Kanaya and Woo (2000)). In the S&L crisis deregulation and new types of owners caused extreme growth in S&L institutions during the years 1983 to 1985 (FDIC (1997)). Regulatory capital was augmented by the use of regulatory accounting principles (RAP). These accounting principles were more lax than the principles in the US GAAP. Another example is the amortisation of supervisory goodwill, which regulators allowed to be increased from 10 to 40 years.

2.3   Three trends shaping the financial system up to the 2008 crisis

2.3.1   Globalisation, international financial markets and large global banks

The world economy has become more open and integrated with regard to trade in goods and services. European countries were early movers among the OECD countries in the trend towards greater integration. The Treaty of Rome in 1957/58 became the basic legal framework for the establishment of the single market in the European Union (EU). By 1968, a full customs union was established, with tariffs and quotas on internal trade being abolished and a common external tariff on third countries coming into effect. Although trade liberalisation proceeded much more slowly at the global level than it did in Europe, major

expansions of trade followed with the Global Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organisation (WTO), which was established in 1995.[9]

Harmonisation of accounting standards across countries was an important instrument for increased economic integration. The call for international harmonisation and convergence of accounting standards started in the late 1950s.[10] A harmonised set of accounting rules was seen as necessary to promote cross-border capital flows. The United Nations promoted the use of international accounting rules as a means to promote investment and economic growth. Other bodies giving support to global accounting standards were the G20 countries, the World Bank, IMF and the Basel Committee on Banking Supervision. The replacement of local GAAPs with international accounting standards led to increased comparability across companies and countries. Replacing accounting standards may, however, be demanding for preparers and users trained and accustomed to the local standards. In many cases the international accounting standards focus more on the equity investor perspective than the local standards.[11]

Political reform in Eastern Europe in the early 1990s ended the cold war and set the stage for further trade and integration. The growth in export from China and the growth of emerging economies in the late 1990s and in the first years of the 2000s showed that globalisation was becoming a reality. The now familiar term BRIC was first used in 2001, denoting the countries Brazil, Russia, India and China.[12]

Increased trade and integration came hand-in-hand with increased banking activity across national borders. Foreign banks tend to follow their customers, and banks entered countries with which their home country had strong trade linkages (Claessens and Van Horen (2014)). Common language and geographic proximity are also important determinants when banks establish operations abroad. At first foreign banks primarily focused on providing financial services to their international corporate clients in host countries. In the beginning of the 2000s there was a shift where foreign banks increasingly provided services to the host economy, including personal and housing related lending (IMF (2007)).

Deregulation facilitated the emergence of financial conglomerates, often through mergers and acquisitions. Financial conglomerates could be involved in activities such as banking, securities trading and services, asset management and insurance. This process led to large and complex financial institutions with a global presence. It was, however, not only large banks from developed countries that engaged in cross-border activities. Many medium-sized banks established activities abroad. According to Claessens and Van Horen (2014), banks from OECD countries invested mostly in emerging markets and other OECD countries, banks from emerging markets tended to invest in developing countries or in other emerging markets and banks from developing countries tended to invest in other developing countries or in emerging markets.

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[9] Some of the important GATT rounds were the Dillon round (1960–61), the Kennedy round (1964–67), the Tokyo round (1973–79) and the Uruguay round (1986–1994). The Doha round under WTO started in 2001.

[10] A brief history of the international convergence of accounting standards is presented on FASB's home pages, see www.fasb.org/jsp/FASB/Page/SectionPage&cid=1176156304264.

[11] As an example, when describing the implementation of IFRS in Germany, the United Nations (2008) noted several shortcomings of the German GAAP compared to IFRS. Some of the German GAAP's shortcomings were: 1) overemphasis on creditors and too much weight on the prudence principle, 2) artificial stabilisation of profits by building up and reducing hidden reserves, 3) tax accounting affects commercial accounting and distorts the objective of the commercial balance sheet and 4) too many accounting policy choices.

[12] Since 2010 the term BRICS is used, which also includes South Africa.

2.3.2 Increased role of securities markets, fair value measurement and off-balance sheet financing[13]

The downscaling of capital controls allowed foreign investors to invest at national stock exchanges. Large investors, and retail investors through investment funds, could invest in emerging market or global portfolios of both equity and debt instruments. The harmonisation of accounting standards made it simpler for foreign investors to use financial statements when analysing equity and debt instruments.

Securities markets, as opposed to real markets, are characterised by low transaction costs, high liquidity and many market participants. Efficient securities markets allow new information to be quickly reflected in prices.[14] Stock markets will reward good management and debt markets will require lower interest rates from less risky banks. Through its' price setting, securities markets will therefore work as a mechanism for allocating resources to their most productive and efficient use.

The trust in markets' ability to correctly price the stock of a firm led shareholders to link managers' pay to the development in stock prices. Stock options were seen as a means of mitigating the principal-agent problem between shareholders and management. Another example of the increasing role of securities markets was the inclusion of market discipline as one of the three pillars in the Basel II framework. Market discipline will, however, only work if the market has enough relevant information, and banks were required to publish information enabling investors to properly evaluate the risk banks were exposed to.

Securities markets did not only grow in size due to the increased volume of traditional stocks and bonds. Financial innovation involved a growth in derivatives markets and the securitisation of assets previously held on banks' balance sheet. Traditionally, securitisation involved the sale of assets by banks to a special purpose vehicle which financed the purchase of the loans through issuance of asset backed securities. Securitisation of mortgages started in the US in 1970 and much later in Europa (Segoviano et al (2013)). UK's first residential mortgage backed security was issued in 1985.

The advantages of securitisation were risk diversification for investors, lower funding costs for banks, improved liquidity for illiquid assets and improved regulatory capital ratios for the originating bank. Securitisation increased over time, and one of the factors driving the increase in securitisation was regulatory arbitrage by banks. The regulatory framework under Basel I contributed to this. Jackson et al (1999) examined the impact of Basel I and concluded that (p 26) "The available evidence suggests [, therefore,] that the volume of regulatory capital arbitrage is large and growing rapidly, especially among the largest banks."

The securitisation and increased role of securities markets changed banks' business models in different ways. Llewellyn (2013) argues that the traditional banking model was the main model during the years 1960 to the beginning of the 2000s and that the "immediate pre-crisis model" was prevalent during the period 2000 to 2007. The pre-crisis banking model was characterised by banks originating loans, as in the traditional model, but the loans were securitised and removed from the banks' balance sheet (originate to distribute). Banks also increasingly relied on short term market funding and a larger portion of their assets were securities. The trading book constituted an increasingly larger part of the balance sheet. One reason for this was that regulatory capital charges were lower for the trading book than for the banking book.

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[13] Financial systems may be classified as bank based or marked based. Markets played an increasing role in both types of systems, but the distinction between the two remained. A distinction may also be made between the role of markets depending on the type of banks. Small banks and corporate or mutual banks are less dependent on securities markets than other types of banks.

[14] In efficient securities markets all relevant information is reflected in prices.

Securities markets thus played an increasingly important role for banks, both on the asset side and as a source of funding. Securities not held to maturity are measured at fair value, both under IFRS and US GAAP. [15] Both standards have a hierarchy of fair value methodologies ranging from the use of observable prices in liquid markets (mark-to-market) to model-based prices (mark-to-model). The measurement of assets at fair value was seen as positive, giving an unbiased estimate of firms' resources. After the savings and loan crisis in the US in the mid-80s, some argued that banks' assets should increasingly be measured at market values to allow securities markets and investor to "supervise" banks' risk taking (FDIC (1997, p 84)).

Securitisation and the establishment of special purpose entities such as structured investment vehicles (SIVs) led to a strong growth in banks' off-balance sheet entities from the mid-1990s on (IMF (2008)). Such entities are not consolidated under IFRS or US GAAP if the bank does not hold the majority of the risk or rewards related to the entity. As a result of the financial crisis with falling prices and the drying up of liquidity, several banks brought their SIVs onto their balance sheet. This caused uncertainty about the real exposure of banks to future credit losses.

2.3.3 Increasing complexity of financial products

Financial products like collateralised debt obligations (CDOs) were referred to as "toxic assets" when the crisis started. This name implied that the value of the assets was uncertain and that it could fall rapidly if the value of the underlying asset or security fell. The liquidity in these financial products dried up, and prices based on actual transactions in the market were not available to determine the value.

However, not all securitisations were complex. [16] Certain types of securitisation products that were developed during the years 2000 to 2007 were most opaque (Segioviano et al (2013)). The complexity arose along several dimensions. First, securitisations were made by using collateral with high credit risk (such as subprime mortgages), but with a complex tranching of the securities financing the asset pool. This financial engineering allowed a large part of the securities to receive a good rating by credit rating agencies. Second, the collateral pool became in itself complex when tranches of debt from other SIVs were used as collateral (CDO squared) or when derivatives contracts (CDS) were used as the underlying collateral (synthetic CDOs).

The increase in the most complex products was driven by several factors. One was the incentive to originate large volumes of subprime mortgages. Subprime mortgages increased the share of the US mortgage origination from about 7 to 20 percent during the years 2000 to 2006 (Segioviano et al (2013)). Another important role was played by credit rating agencies who assigned good credit ratings to these complex financial products.

In a rising market, liquidity is often high, and prices are easily observable, which simplifies fair value measurement. This was also the case for the more complex securitised products that emerged in the last years before the crisis broke out in 2008. During the crisis, however, the liquidity dried up for these complex products and fair value measurement had to rely on pricing models (which was increasingly questioned by the market). In addition, the credit rating agencies re-evaluated their rating models. This led to massive downgradings of the most complex products.

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[15] In FAS 157 fair value is defined 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."

[16] Whether a financial product is considered to be complex depends to some degree on how long it has been present and traded in the market. Initially all new types of securities or contracts may be regarded as complex, or difficult to understand. Over time investors get accustomed to new products.

2.4   Summary

The 2008 global financial crisis highlighted the relationship between accounting standards, banking regulation and financial stability.

In the decades before the crisis, reduction in trade barriers through free trade agreements and reduction in capital barriers, together with the harmonisation of accounting rules, contributed to an increase in global trade and capital flows. Banks followed their customers and expanded internationally. This development led to the emergence of large global banks and to global financial markets.

Securities markets grew in size and diversity. Banks' regulatory arbitrage contributed to the growth in securitisation. Fair value accounting helped banks to show increasing profitability and to expand during times of rising asset prices.

The complexity of financial products increased mainly in the period from 2000 to 2007. The complexity was primarily related to credit risk derivatives and the financial engineering done to produce AAA-securities. The number of off-balance sheet entities grew as a part of the securitisation process. When the crisis started, several banks brought their off-balance sheet entities onto their balance sheet. This caused uncertainty about banks' true risk exposure and about the safety of banks.

Policymakers have agreed to a multitude of measures aiming to increase the resilience of the financial system as a response to the global financial crisis. This includes on the regulatory side, for example raising the level and the quality of banks' capital, the introduction of new liquidity standards, the OTC derivatives reforms, and the measures targeted at shadow banking. The international and US accounting standard setters have, for example, given guidance on how to determine fair value in illiquid markets, they improved the accounting for off-balance sheet items and they issued standards on expected loan loss provisioning, which are forward-looking and take account of the lessons of the crisis. However, the trend towards a globalisation of financial markets still calls for a higher convergence of financial instruments accounting under IFRS and US GAAP, which would further enhance the resilience of the global financial system.

After these general thoughts about the relation between the regulation and accounting of financial institutions, this report presents also the findings from specific research projects in the following section. Section 3.1 focuses on instruments valued at amortised cost and summarises research on the timeliness, adequacy and cyclicality of banks' loan loss provisions. In contrast, Section 3.2 focuses on instruments and describes potential implications for market discipline, contagion risk, and the role of prudential filters.

3.   Findings from specific research projects

3.1   Loan loss provisioning models, banks' practices and procyclicality

This section aims at introducing the concepts of loan-loss provisioning models and explains how six research projects on provisioning relate to the literature on loan loss provisioning, which was described in detail in BCBS (2015b).

All of the six projects are empirical in nature, using panel data sets to assess the incentives and impacts of provisioning decisions and the relevant policy conditions. In particular, Domikowsky et al (2014) use a supervisory dataset on German banks that covers the years 1995 to 2010, comprising of more than 5,000 banks. Schechtman and Takeda (2016) use supervisory data on approximately 50 Brazilian banks, covering the years 2005 to 2013. Park et al (2015) use a supervisory dataset that comprises of over 120 domestic commercial and savings banks as well as foreign branches, covering most of the banks during

the years 2001 to 2014.[17] Arbak (2015) uses an annualised dataset comprising of 28 Belgian banks covering the years 1999 to 2014 based on annual observations. Gaul and Uysal (2015) rely on a loan-level data obtained from the US Shared National Credit (SNC) loan data, which are then used to determine banks' loan loss reserves. Domikowsky, Foos and Pramor (2015) compile an international database that brings together historical information on the provisioning regimes for up to 52 countries with bank-level data for up to 4,500 banks operating in those countries, spanning over the years 1997 to 2012.[18]

To a large extent, one common aspect in all of the mentioned projects is that banks have some form of discretion over their choice of provisioning levels, at least partially. This flexibility given to banks is clearly essential for an empirical study over how those decisions may be shaped and what those decisions may bring in terms of their eventual impacts. However, the discretion, and the ability of banks to use provisioning policy to manipulate their earnings, has also been a source of concern, leading to the development of the "incurred loss" provisioning under the International Accounting Standards (IAS) 39 rules in mid-2000s.

Under the *incurred loss* provisioning model, losses can only be recognised if there is objective evidence that a financial asset or group of assets is impaired. While this might have reduced the potential for discretion for banks, it has been recognised, especially amidst the financial crisis, that its backward-looking nature might give rise to less timely and inadequate provisioning in good times and a sudden rise of provisioning in early phases of crises. These concerns in turn have led to the G20 recommendation to develop new standards to replace the IAS 39 rules with the development of the IFRS 9 rules, which will substitute the incurred loss approach with a more forward-looking expected loss model. These rules are expected to enter into force from 2018 across the globe.

Although the projects have varying objectives, in broad terms they all aim at assessing the underlying incentives and the eventual impacts of the provisioning decisions of banks as well as the policy choices that shape those decisions. With this in mind, the studies aim at responding to four distinct – but not necessarily mutually exclusive – policy questions, which are closely related to the developments and concerns identified above.

The first and foremost policy question that is assessed by almost all of the projects in this work stream is **whether the provisioning policies are timely and adequate**. The focus of this branch of research is whether a bank builds up adequate reserves in a timely manner, or as evidence on potential future losses mounts. Empirically speaking, one could conjecture that the non-discretionary and backward-looking nature of IAS 39 rules might have undermined the timeliness and adequacy of provisioning policies, especially during expansionary periods in which incurred losses are relatively low. In turn, one could alternatively argue that a bank may choose to disregard any evidence on future expected losses and delay loss recognition if it had full discretion over its provisioning policies. In studying the pre- and post-implementation period for IAS 39 rules, these papers can provide answers to both arguments.

A second policy question studied by most of the papers is **whether provisioning has a cyclical element**. In a nutshell, cyclical provisioning can mean two things. On the one hand, banks may provision less in an upswing due to a variety of reasons. As noted above, under the IAS 39 rules, one would indeed expect provisions to be lower during an upswing when incurred losses are relatively small. More broadly, banks may want to maintain their market power in such expansionary periods, which may be accompanied by a collective loosening of lending standards and possibly their provisioning policies. On the other hand, supervisors (or the bank itself) may prefer that banks provision more during upswings and use these reserves when credit quality deteriorates in the future. The sample of the papers cover at least one important crisis event, most notably the most recent global financial crisis of 2008/9, which gives them the

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[17]   For savings banks, the Korean dataset only covers the years 2009 and 2014.

[18]   Further recent evidence on the timing of Dutch banks' loan loss provisioning during the crisis is provided by de Haan and van Oordt (2016).

comparative advantage of responding to this policy question by linking whether provisioning practices respond to underlying economic conditions.

A third common policy question that is answered by several papers is **whether earnings and capital management incentives influence provisioning decisions**. Since provisions are booked as expenses, they may be used to manage an institution's earnings, possibly to meet market expectations and internal targets. Provisioning may also influence the level of regulatory capital, either through its impact on retained earnings or more directly to the extent that loan loss reserves are included in the calculation of total regulatory capital.[19] A portion of loan loss provisions may also be tax-deductible, giving banks an added incentive to provision more in any given period for tax-related purposes. More broadly, higher provisions today may signal that future earnings will rise, especially if these investors believe that the reserves can be used to that effect. These inter-linkages imply that managers may use provisioning policy to meet market's or shareholders' expectations, ultimately to maximise their own earnings. Given that the "incurred loss model" was developed to precisely counter such forms of manipulations, it is essential to see the likelihood that management incentives may be rooted out by the policy change.

A fourth policy question that has been taken into consideration by some of the papers is **whether backward-looking provisioning rules amplify procyclicality in lending**. Economic theory has several explanations as to why lending volume may move in tandem with economic conditions while lending standards and credit quality may move in the opposite direction. The *capital crunch hypothesis* predicts that as capital requirements become binding during a downturn, banks may downscale their lending activities. Similarly, banks may relax their lending standards during expansionary periods to increase their reported earnings and as their capital ratios improve above the minimum requirements. Furthermore, expansionary periods often imply a reduced likelihood that a particular loan will face non-payment. Managers facing short-term incentives may be inclined to grow their lending business, possibly by lowering their institution's lending standards and cutting down on costly risk monitoring, which will ultimately lower the quality of their credit portfolio.

In the next subsections we provide a detailed overview of the relevant projects with regards to these four policy questions.

3.1.1 Is provisioning timely and adequate?

Delayed expected loss recognition has been found to be potentially problematic for at least two reasons: compared to timely provisioning, banks may be less willing to lend during recessions (Beatty and Liao (2011)), and their risk of capital inadequacy is higher in downturns (Bushman and Williams (2013)). Hence, the identification of both the timeliness and adequacy of banks' provisioning policies is an important task for bank supervisors and analysts and thus a challenging research question for itself. It is also needed for a meaningful analysis of its potential consequences, eg regarding bank lending and risk.

Empirically, this necessitates the use of a non-discretionary measure of credit quality. Most papers in the literature rely on a change in the share of non-performing loans (NPL) to total loans or total assets

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[19] The extent to which loan loss reserves are included in the calculation of regulatory capital varies from one jurisdiction to another although under the Basel II and III frameworks the local standards have started to gradually move to a more uniform treatment. Under Basel I and the standardised approach to credit under the Basel II and more recently the Basel III standards, general loan loss reserves may be included as Tier 2 capital, up to a maximum of 1.25% of risk-weighted assets. Under the internal ratings-based (IRB) approach of Basel II and Basel III, loan loss reserves were to be built to absorb any expected losses while the regulatory capital requirements are to protect against unexpected losses. Thus, the IRB approach allowed the recognition of total reserves (including both general and specific reserves) that are in excess of expected losses as Tier 2 capital, once again up to a limit of 0.6% of risk-weighted assets. In turn, any shortfall has to be deducted from both Tier 1 and Tier 2 capital in equal amounts. In Basel III, the deduction from capital in respect of a shortfall of the stock of provisions to expected losses under the IRB approach should be made in the calculation of Common Equity Tier 1.

as an indicator of timeliness. In a nutshell, a rise in the NPL ratio implies a greater probability that the bank will face or have already faced accounting losses, depending on the supervisory treatment. If provisioning policy is insensitive to changes in non-performing loans, it is likely to be less timely.[20]

At first sight, the use of the non-performing loans ratio as a non-discretionary proxy for credit quality may appear curious. For one thing, banks may have some flexibility in determining whether a loan is non-performing as recognising the losses on that loan. However, starting with the Basel II accord, regulators across the world have required banks to automatically re-classify loans that are past-due (usually for a period of 90 days or more) as non-performing.[21] To that extent, the standardisation of the definition of non-performing loans ratio should result in a relatively non-discretionary measure.

Timely loss recognition also implies a forward-looking element rather than a narrow focus on past credit quality. This has not been entirely taken into account in the popular use of current or past NPL ratios as proxies of credit quality. Past-due loans are also those for which interest accruals have been impaired, implying immediate and possibly past losses. Thus, a provisioning policy that is closely linked with current NPL ratios is likely to be backward-looking. To the extent that timely provisioning implies recognising losses before they happen, banks aiming to provision for expected losses should also consider forward-looking estimates of NPL.

Five of the six papers on loan loss provisioning presented in this report have sought to address whether provisioning policies appropriately take account of future losses in a timely manner.

Domikowsky et al (2014) assess the extent to which loan loss reserves[22] respond to changes in the share of current and forward NPL ratios. This approach is motivated by the fact that banks that are subject to the German GAAP, a subsample of the banking sector, are free to choose between different types of provisioning practices, including but not limited to forward-looking provisioning. In order to focus on the question on whether banks take advantage of this flexibility, the authors remove all banks that are subject to international accounting rules (IAS 39) from their sample.

Under the German national accounting standards, banks are allowed to build general and specific loan loss reserves. Specific reserves are expected to cover loan-specific risks for smaller portfolios of relatively homogenous loans. General provisions are instead aimed at covering latent risks such as future losses that cannot be related to a specific loan as well as economic risks relating to larger and more diversified portfolios of loans. Banks can also build a third pocket of reserves to provide allowances for specific credit and market risks, but these are often less used due to various restrictions on their use.

Domikowsky et al (2014) find that the relative flexibility afforded to German banks has been partly effective. Indeed, provisions increase when both current and one-year forward NPL ratios deteriorate. In particular, the authors find that specific provisions are strongly and positively correlated with the change in NPL ratio from the current year to the next. Further analysis of the subsectors reveals that the latter result is stronger for cooperative banks and savings banks than for commercial banks. Interestingly, the other reserve pockets, including most notably the general reserves, do not appear to be used for other purposes, including provisioning for current losses, implying that at least some part of the potential losses may not be covered.

Much like the German study, Schechtman and Takeda (2016) take advantage of the discretion granted to Brazilian banks in building up a part of their loan loss reserves. Under the Brazilian national

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[20]   Empirically, De Haan and van Oordt (2016) document for a sample of Dutch banks that the target level of allowances amounts on average to 49% of impaired loans, and they analyse the speed at which this target level is reached.

[21]   The NPL definition of Basel II also contains a discretionary element. Indeed, a bank may identify a loan to be non-performing if the obligor is deemed to be unlikely to meet its credit obligations in full, even if its interest payments are not past-due.

[22]   In this subsection, we distinguish between loan loss provisions and loan loss reserves so that the former variable represents the net addition of loss allowances to the latter variable. Loan loss provisions are identified as a flow variable while the loan loss reserves are identified as the stock variable, which appear on a bank's balance sheet as a liability (or a contra-asset value).

accounting rules, banks have to first build a largely non-discretionary reserve, which are based on minimum provisioning rules set by the supervisor. On top of this floor are the discretionary reserves, for which banks have substantial freedom. Unlike most of the literature, the authors experiment with several NPL definitions that take account of different loan past-due ranges.

Schechtman and Takeda (2016) find that when most of the (statistically significant) NPL ratios grow, the discretionary component of loan loss provisioning also grows. Since some NPL classifications may pick up problem loans at a relatively early stage (eg loans that are past-due for more than 15 days), a link between those measures and loan loss provisioning hint at the presence of an expected loss component. For forward NPL ratios, only indicators that are based on a relatively early stage of arrears are positively linked to discretionary provisioning in a robust and significant manner, potentially providing evidence on the forward-looking aspect of the latter.

Park et al (2015) use a supervisory dataset to assess the impact of the implementation of the international accounting standards on the provisioning practices of Korean banks. What makes the Korean framework unique is that the shift from national to international accounting rules is directly reflected in sample. While all Korean banks were subject to the national accounting rules until 2011, the provisioning data on commercial banks and foreign branches used in the study is directly aligned with international accounting rules under IAS 39. In addition, since 2011, the data also allows a distinction between IAS 39-compliant reserves and "excess reserves", which are in line with the national rules but more discretionary.[23]

Park et al (2015) show that the IAS 39-compliant reserves are linked to current NPL ratios and that the relationship is weaker when forward NPL ratios are considered. While the paper does not directly investigate the question of whether the provisioning policies have become timelier in the course of the years, the authors do find that the implementation of IAS 39 has generally led to an increase in the amount of total loan loss reserves, including both IAS 39-compliant and excess reserve, although there was no change in minimum provisioning requirements. This implies that the national rule has contributed to preserving the loss absorbency of Korean banks, even after controlling for cyclical factors.

As noted above, the share of non-performing loans measures the ratio of loans that are deemed to be in default. This implies that although the indicator may be a good measure of non-payment probability (or probability of default), it may not fully capture the expected losses on those impaired loans.

Gaul and Uysal (2015) use a novel approach to provide a more accurate estimate of how timely the provisioning occurs. The analysis is based on the internal loan loss assessments that are reported to the US Shared National Credit (SNC). Under the program, each US regulated entity has to report to the SNC their own internal risk ratings and loan loss assessments for syndicated loans and loan commitments of more than $20 million. The internal loan loss assessments are used to determine banks' loan loss reserves.

The authors' empirical analysis essentially uses the internal loan loss assessments and the relevant empirical test is whether the corporate loan spreads at the origination of a loan are correlated with future changes in loan loss allowances. If provisioning is timely, meaningful information regarding future losses should be taken into account as soon as that information is available. In other words, lagged information should be a robust estimator of future loss assessments, especially as the lags grow.

The results show that corporate loan spreads at origination persistently forecast future downgrades of those loans to the substandard and doubtful categories beyond the origination date. Moreover, the recognition of losses on substandard and doubtful loan categories is slower during expansionary periods as well as for banks with lower earnings or higher provisions.

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[23]   Out of concern that the nominal amount of accounting standard compliant reserves would decline significantly after introduction of the IAS 39, the Korean Financial Supervisory Services (FSS) introduced a new requirement that Korean banks appropriate retained earnings as excess reserves (termed "reserves for loan losses") in the amount of or above the difference between their IAS 39 compliant reserves and their minimum provisioning requirements.

Unlike most of the literature, Arbak (2015) focuses on the adequacy of provisioning. While timeliness may be a desirable component of provisioning, another element that is of interest is whether the reserves that are built up compare well with the actual (ie charged-off) losses. Actual losses have a mechanic impact on loan loss reserves. When a loan is charged-off, the (unimpaired) value corresponding to that loan is taken off the asset-side of a bank's balance sheet. At the same time, the reserves that have been accumulated for those loans are removed from the liability side. Based on this latter relationship, one would then expect that loan loss reserves would drop as current losses are realised. A one-to-one (negative) relationship would indeed imply that the provisioned amounts correspond perfectly to charged-off losses.

Under Belgian national accounting rules, institutions are granted flexibility over the choice of provisioning policies for individual reporting purposes, as opposed to consolidated reporting. Some of the banks in the sample did have to adjust their reporting systems between 2005 and 2006 by implementing IAS 39 for their consolidated accounts but not necessarily for their individual accounts. The empirical tests assess whether the parallel IAS 39 implementation might have led to spillovers to individual data, thus having a broader influence on the provisioning policies of Belgian banks.

The empirical results show that loans loss reserves drop by almost one-to-one in response to charged-off losses. This implies that the loan loss reserves are in broad terms adequately built to absorb losses. The implementation of IAS 39, however, appears to have generated a weak but statistically significant spillover. In particular, banks that are subject to IAS 39 appear to accumulate reserves more gradually, even after controlling for the recent financial crisis and potential endogeneity between current and forward losses. Moreover, larger institutions appear to partly take account of their potential losses, implying that their loan loss reserves on average prove inadequate. There also appears to be a weak but statistically significant link between forward losses and current provisioning, especially amidst the financial crisis, implying that loan loss reserves are built in a more or less timely manner.

3.1.2 Does provisioning have a cyclical element?

Prior research (Laeven and Majnoni (2003), Pain (2003), Bikker and Metzemakers (2004)) documents that banks' loan loss provisions strongly fluctuate with the business cycle, which may be driven by banks' higher credit risk in economic downturns as well as by their incentive to postpone provisions under favourable conditions.

Empirically, an assessment of the extent to which provisioning is cyclical is often made with reference to a mix of variables. Natural choices are variables that summarise current macroeconomic conditions, including most notably real GDP growth and unemployment rates. Bank-specific variables, such as growth in consumer loans, can also be used to control for the fact that upturns are often accompanied not only by increased lending but also by lower monitoring and lending standards. More direct indicators on credit quality, such as current or past NPL ratios, may also be used to measure the degree of cyclicality, highlighting a clear overlap with the previous policy question.

Four of the six projects on loan loss provisioning address the question on whether provisioning may be related to the business cycles.

Taking advantage of the flexibilities afforded to German banks under national rules, Domikowsky et al (2014) assess whether banks may be using such discretion to account for economic cycles in their provisioning policies. The authors find no significant evidence on whether concurrent GDP growth has any impact on provisioning. In particular, specific reserves, which are set aside to cover loan-specific risks, increase when GDP growth is high while general reserves appear to move in the opposite direction.

Likewise, Arbak (2014) finds no convincing evidence that macroeconomic conditions matter for the loan loss provisioning practices of Belgian banks. In particular, macroeconomic conditions such as GDP growth and unemployment lose any significance once realised losses are properly accounted for. This

implies that the cyclical considerations only matter indirectly via their impact on current and future losses as well as earnings.

Unlike the previous papers, Schechtman and Takeda (2016) show the presence of cyclicality in the Brazilian case. In particular, the authors provide evidence that discretionary provisions are lower in upswings and higher in downturns (although the same may not apply to minimum provisions that are largely based on regulatory ratings and the share of past-due loans). The result shows that macroeconomic conditions help explain the more flexible part of the provisioning policies. The result may also suggest the appropriateness of the introduction of countercyclical regulatory policies, such as the one studied by the authors.

Park et al (2015) find that the IAS 39-compliant reserves of Korean banks also set aside less provisions during upswings. This implies that the banks may be taking into account the macroeconomic conditions and their impact on the underlying loans in a general manner. However, the results become insignificant when excess reserves are considered. This confirms the weak evidence highlighted in the German and Belgian papers, where provisioning, if a discretionary component is included, has no clear direct cyclical component.

Gaul and Uysal (2015) also find that provisioning clearly has a cyclical component, especially for banks with less timely provisioning. The results are similar to the two studies cited above although with a slight twist. Indeed, the authors show that banks tend to set aside less loan loss allowances during upswings but only if they are slow in recognising their substandard and doubtful loans.

3.1.3   Do management incentives influence provisioning?

In order to assess whether earnings and capital management incentives are influential on provisioning policy, various control variables have been used in the literature. Theoretically, there are several rationales for this behaviour. Banks' may use their discretion in loan loss provisioning to manage their reported earnings, eg to meet earnings benchmarks (Dye (1988), Barth et al (1999) and Degeorge et al (1999)). Further, they may use discretionary loan loss provisions to manage their reported (accounting or regulatory) capital, which is used as an indicator of capital adequacy by the market, banking regulators and supervisors, or to signal private information about future earnings changes (Beaver et al (1989)).

A natural choice for assessing whether earnings management has an impact on provisioning is to empirically assess whether the non-discretionary component of net income is correlated with provisioning levels, focusing on earnings before provisioning and tax. If provisioning policy is indeed used to smooth earnings or to meet investors' expectations, one would expect a bank to increase provisioning when the earnings are high. Conversely, managers who aim to push earnings towards higher targets may lower current provisioning. In a similar manner, one would expect provisioning to respond positively to available core capital, after neutralising (if necessary) the direct impact of provisioning on regulatory capital.

Four projects have taken into account of the managerial incentives and their impact on provisioning policies.

Domikowsky et al (2014) provide evidence that earnings management may be a non-negligible component of the specific provisioning levels of German banks. This is not surprising since provisions represent a substantial portion of the variation in the non-discretionary components of net income lines. Interestingly, the same statement cannot be made regarding general provisions. Once again, this is understandable since general provisions are expected to cover latent risks relating to future expected losses as well as macroeconomic risks. Lastly, banks do not seem to be using their provisioning policy to signal their future earnings.

The authors also show that provisioning policies do not appear to be linked with capital management in the sense mentioned above. Instead, banks with higher capital ratios are inclined to provision less, which may be a reflection of the management's belief that the bank has sufficient cushion or that well-capitalised banks are also those with relatively riskless positions.

Arbak (2014) provides a similar test on whether earnings and capital management may play a role in the determination of provisioning policies of Belgian banks. Earnings management appears to be relatively uninfluential, but only for larger banks and more so amidst the financial crisis. These banks also appear to provision more when future earnings are large. Capital management seems to play a role, but mostly for smaller banks. The results show that earnings management or capital management behaviour has not changed with the implementation of IAS 39 rules but that the financial crisis might have offset the role played by capital management.

Park et al (2015) use a similar approach to assess the extent to which earnings management and capital management may be contributing to the determination of loan loss provisioning by Korean banks. The authors' results illustrate that earnings management may be one of the discretionary motives contributing to the determination of loan loss provisioning. This is particularly the case once bank size is controlled. Interestingly, the introduction of IAS 39 does not appear to have played a major role. Moreover, earnings management does not appear to be a plausible explanation for savings banks, which have not been subject to IAS 39 throughout the sample period.

Schechtman and Takeda (2016) are principally concerned with whether capital management incentives may have any impact on the provisioning policies of Brazilian banks. In particular, the authors take advantage of a policy change (effective between 2008 and 2010) that temporarily recognised the part of total reserves that are in excess of the regulatory minimum as Tier 1 capital. Unlike other studies, the assessment relies on a non-discretionary measure of regulatory capital, excluding various types of discretionary elements, including most notably loan loss provisions. Lastly, the authors also control for potential earnings management behaviour with the use of a similar measure.

The authors' results show that the temporary policy was mostly successful in getting some banks to provision more. In particular, banks with lower capital did respond to the additional incentives by provisioning more above the regulatory minimum during the period in which the policy was in effect. Outside this period, capital management does not appear to be influential in the determination of loan loss provisions. In turn, earnings management was influential in the determination of loan loss provisions above the regulatory minimum throughout the sample period.

3.1.4   Do backward-looking provisioning rules amplify the procyclicality of lending?

Compared to the setup of the projects outlined above, assessing the impact of provisioning on lending decisions implies a change of direction in the empirical analysis. So far, all of the policy questions focused on the different components of provisioning decisions by banks. This last policy question looks at whether provisioning may be a factor in explaining the sensitivity of lending decisions to underlying macroeconomic conditions. As noted above, the IAS 39 rules have been criticised in that they led to backward-looking provisioning, implying that banks only build up their reserves in bad times, which increases the cost of new lending to the real economy exactly when that may be desirable from a general welfare point of view.

Two projects with relatively distinct methodologies have considered whether lending is more sensitive to economic conditions under regulatory regimes that prescribe a more backward-looking approach.

Park et al (2015) investigate whether the relationship between the Korean business cycles and lending strengthened after the implementation of the IAS 39 rules. The authors find that the statistically significant positive relationship did strengthen following the implementation of the international accounting standards in 2011. In particular, the sensitivity of the loans for domestic commercial banks to real GDP growth almost quadrupled with the IAS 39 rules. The same results cannot be obtained for local banks that did not implement the international standards, which eliminates the possibility that the increased sensitivities may be due to other omitted factors (ie crisis conditions).

Differently than all of the other five papers covered above, Domikowsky, Foos and Pramor (2015) use a cross-country sample of banks. The authors include a variety of country-specific macroeconomic variables corresponding to the coverage in the international bank-level data. Information contained in a survey of provisioning characteristics is further aggregated into indices that aim to capture the extent to which the national rules impede deviations from backward- or forward-looking provisioning.

Data on provisioning rules is obtained from the World Bank's Bank Regulation and Supervision Survey (BRSS), which was conducted in the years 2000, 2003, 2007 and 2012 for up to 150 countries. Among other supervisory and accounting characteristics, the surveys specifically cover country-specific provisioning rules in place. Due to a lack of homogeneity over the years in the information on provisioning in the survey, the authors supplemented the BRSS database with their own survey spanning 11 countries, including the members of the RTF-RA work stream.

The empirical results of Domikowsky, Foos and Pramor (2015) confirm that banks in jurisdictions with more backward-looking provisioning rules contract lending more strongly during economic downturns than banks that operate under forward-looking regimes. In particular, nominal GDP growth has a much stronger impact on the change in loans provided by banks under regimes that are more backward-looking oriented. The result is robust to a number of alternative methodological and variable specifications, such as the inclusion of alternative macroeconomic indicators (ie GDP growth, unemployment, etc), controlling for loan demand conditions, distinguishing smaller banks from their larger peers or focusing only a smaller subset of countries (ie the RTF-RA subsample). Although the methodology and data used in this paper do not allow for an impact assessment of IFRS 9, its main result can be seen as evidence supporting the movement towards an expected loss provisioning model.

3.1.5 Synthesis of research findings on loan loss provisioning

As noted above, the papers presented provide a relatively broad view of the provisioning choices of banks, policies that shape those decisions, and the ultimate impact of these circumstances. Given that the samples in these studies cover a variety of business models, regulatory regimes as well as economic conditions and that the empirical methodologies differ substantially, it is only natural that the responses to the common policy questions will be different. However, strong and common positions also emerge in some cases. These differences, their potential underlying causes and the broader commonalities are discussed in this section.

One common message that comes out of the body of research in this work stream is that the provisioning choices of banks are to a large extent backward-looking, putting into question the timeliness and adequacy of the loan loss reserves. In particular, there is strong evidence from the studies covering Belgium, Germany, Korea, and the US that as current and past credit quality worsens, provisions increase in a statistically significant manner. Indeed, all of these studies show that changes in current credit quality indicators, measured either by changes in NPL ratios, charged-off loan ratios, or simply by loan spreads at origination, emerge as highly robust estimators of loan loss provisioning decisions of banks. In turn, the studies also show consistently that future credit conditions, as measured by comparable indicators, play a much weaker role in determining current provisioning decisions.

The studies mentioned in this report provide several explanations as to why provisioning may be insensitive to forward-looking indicators. The results of Schechtman and Takeda (2016) suggest that some of the weak findings could be explained by the choice of indicators and that the results could improve if an indicator that is based on a relatively early stage of arrears was used instead of the more popular choices. In addition, there is some evidence that certain business models may have a more forward-looking provisioning approach than others, as shown by Domikowsky et al (2014) for cooperative and savings banks. The weakness of forward-looking credit quality as an explanatory variable may also be less worrisome if banks use current conditions to forecast future conditions since the forward-looking element may already been taken into account by the contemporaneous relationship. Gaul and Uysal (2015) show that lagged information, even if highly aged, may continue to play a significant role in shaping bank's internal credit ratings and loan loss assessments over time because it contains valuable information about

future credit quality. The findings in Arbak (2015), however, document that the relationship continues to be weak after attempts are made to address this potential endogeneity problem.

While the evidence on the backward-looking nature of provisioning is relatively consistent, the question on the impact of IAS 39 remains open. The results of Arbak (2015) show that the situation might have gotten worse in Belgium after the implementation of the international standard, as provisions proved less adequate when banks had to charge-off impaired loans. In contrast, Park et al (2015) find that provisions have generally increased with the implementation of the rules. It is possible, however, that the results are at least partly due to the implementation differences in the two countries.

In turn, there is evidence that backward-looking rules effectively serve to amplify the pre-existing procyclicality in lending. In particular, the cross-country study by Domikowsky, Foos and Pramor (2015) confirms that banks that are subject to more backward-looking provisioning rules, such as those embodied under IAS 39, contract lending more strongly during economic downturns. Although more research is clearly needed on this question, this indicates that concerns regarding the IAS 39 rules may be well-founded. Indeed, Park et al (2015) show that the implementation of those rules in Korea has amplified the procyclicality of lending by making Korean banks' lending even more sensitive to economic conditions, in particular during economic downturns.

Likewise, identifying the sign of the cyclical component of provisioning choices turns out to be elusive. As noted above, provisioning increases with backward-looking measures of credit quality deterioration. However, the same cannot be said if other indicators are used to assess cyclicality. The Belgian and German studies find no consistent relationship between macroeconomic indicators and total provisions. In turn, the Brazilian, Korean and the US studies find evidence that discretionary provisions increase as economic conditions (and thus credit conditions) deteriorate. The US study (Gaul and Uysal (2015)), however, shows some weak evidence of exactly the opposite form of cyclicality, that the banks may be building more reserves during economic upswings, possibly indirectly due to a lowering of the incorporation of information into loan assessments.

There is also mixed evidence on whether management incentives are behind provisioning decisions, especially to the extent that capital management incentives are concerned. Almost all studies find that earnings management may be an important component of provisioning, although with varying level of statistical significance not only across countries but also across time periods. The evidence on the importance of capital management is more mixed, although the Brazilian study by Schechtman and Takeda (2016) indicates that the varying treatment of reserves in regulatory capital may be an important factor in explaining these differences. Somewhat surprisingly, there is no evidence from the group of projects conducted that the IAS 39 rules have played a role in reducing the role of management incentives.

3.2   Fair value accounting from a perspective of markets and regulators

3.2.1   Fair value related information and the behaviour of banks and investors

Fair value accounting – sometimes also called mark-to-market accounting – means in its pure form that respective assets and liabilities are represented on the balance sheet by market prices. First, this implies that third parties, eg investors, get an insight into management's views for making their own decisions, and the evidence presented in the previous section illustrates how fair value-related information is processed by market participants. Second, this implies that changes in the fair value are recognised as gains and losses in the income statement. However, actual accounting standards do not implement pure mark-to-market valuation of fair-valued assets, as there are circuit breakers (Laux and Leuz (2010)) and prudential filters, as explained in subsection 3.2.4. Rather than providing a full discussion of the pros and cons of fair value accounting versus historical cost accounting (see eg Landsman (2006)), this section focuses on three specific questions:

(i)   What is the joint impact of market discipline and banks' discretion in how they assess the fair value of assets with no readily observable market prices on their capital ratios? (Bouther and Francis (2017), presented in subsection 3.2.2);

(ii)   To what extent does fair value accounting matter for contagion among large, interconnected banks relative to other channels? (Foos and Georgescu (2014), presented in subsection 3.2.3);

(iii)   How do prudential filters for unrealised gains and losses in relation to debt instruments affect the size of the fair value portfolio and regulatory capital ratio buffers? (Argimón, Dietsch and Estrada (2017), presented in subsection 3.2.4).

It is important to note that these studies provide only partial analyses and that further, comprehensive work would be needed to assess the benefits and risks associated with fair value accounting in general.

3.2.2   Information disclosure, market discipline and bank behaviour

In response to the crisis, regulators have made a number of recommendations for expanding disclosures aimed at increasing transparency and fostering market discipline.[24] This was particularly true with respect to Pillar 3 disclosures focusing on regulatory measures defined in Pillar 1 of the Basel framework, which requires banks to adopt specified approaches for measuring credit, market and operational risks and their associated risk-weighted assets and capital requirements. The intended effects are to decrease the probability of individual bank failure and to promote financial stability more widely.

These objectives depend on the incentives and ability of market participants, including shareholders, creditors and counterparties, to understand and act on such disclosures so as to influence (eg through price and quantity responses) banks' risk-taking behaviour. Underpinning the efficacy of market discipline is the idea that such disclosures are in fact reliable and appropriately interpreted and used by the market.[25] The crisis showed, however, that accounting values may embed a significant degree of uncertainty and, as a result, may impede the market's ability to assess a bank's risk profile and overall capital adequacy. There is some evidence suggesting that accounting discretion may have contributed to this uncertainty (eg Huizinga and Laeven 2012). Given regulators' ongoing emphasis on the role of market discipline in containing risk-taking behaviour, it is important to understand the extent to which various sources of accounting discretion may interfere with this function.

It is also not clear how the interaction of accounting discretion and market discipline plays out as economic conditions or market confidence changes. Prior research showed that banks became increasingly opaque and their disclosures less reliable as economic conditions worsened ahead of the crisis (Flannery et al 2012). Accounting discretion was at least partly to blame for this transition (Huizinga and Laeven 2012 and Laux and Leuz 2010). In response, the market factored this opacity into its pricing decisions, applying higher valuation discounts to banks with more opaque assets (Jones et al 2013). But whether these adverse pricing decisions (or the expectation of such decisions) affected banks' risk-taking behaviour is not apparent.

In this section, we present one study by Bouther and Francis (2017) which attempts to address these issues by examining the relationship between accounting discretion allowed under fair value accounting standards and banks' risk-taking behaviour and whether this relationship depends on the extent to which banks are exposed to market discipline. To develop a model of risk-taking bank behaviour, it extends concepts from the research on the determinants of capital ratios. Using data from Federal Reserve regulatory returns for more than 600 US bank holding companies spanning 2008 to 2013, the authors model banks' choice of capital ratios, which they use as their main indicator of bank risk-taking and then examine the following:

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[24]   See for example, BCBS (2014, 2012) and Enhanced Disclosure Task Force (2012).

[25]   See Flannery (2001) for a good overview of the theory underlying market discipline.

- whether capital ratios differ according to the degree to which banks are exposed to market discipline (ie listed on a primary US exchange or dependent on subordinated debt funding);

- whether capital ratios differ at institutions reporting assets under the Level 3 provisions of the FASB's Accounting Standards Codification 820, Fair Value Measures and Disclosures, which give banks considerable discretion in how they measure assets with no readily observable market prices;

- whether the influence of market discipline depends on the nature of Level 3 assets reported by banks (ie whether in loans, trading assets, or other assets); and

- whether this influence depends on economic conditions or market sentiment.

Of primary interest is whether accounting discretion, which potentially renders disclosures less effective, also influences market discipline over banks' risk-taking (moral hazard) behaviour. The study estimates several models of banks' choice of capital ratios. Separate models for each of the measures of market discipline (subordinated debt funding and listing) are estimated and find a number of similar results. First, exposure to market discipline, either in the form of reliance on subordinated debt or being listed on a US exchange, provides incentives to hold higher capital ratios. Second, the study documents a negative association between capital ratios and Level 3 assets, which is consistent with the idea that the flexibility allowed under the Level 3 provisions may support opportunistic (moral hazard) behaviour. At the same time, however, the paper finds evidence that being listed or relying on subordinated debt dampens this behaviour. The results suggest that market discipline incentivises banks to hold higher capital ratios on average compared with their peers who also engage in Level 3 activities, but who are not exposed to market discipline. Third, these disciplining effects appear more pronounced during economic downturns and more volatile market conditions, consistent with idea that market discipline may be state contingent – and, in particular, less effective during more benign conditions. Finally, corroborating prior research (eg Berrospide and Edge 2010), the authors find evidence of procyclical capital management practices: bank holding companies' choice of capital ratios decreases (increases) as GDP growth increases (decreases). With respect to this finding, they also find evidence suggesting that Level 3 accounting can act to amplify procyclical behaviour.

The results have implications for understanding the merits of regulations designed to address management biases and modelling errors inherent in banks' fair value measurements. The evidence consistent with accounting discretion as contributing to moral hazard behaviour indicates that (additional) prudential valuation requirements may be justified. Benefits of prudential valuation may be greatest during more benign economic conditions, suggesting that regulatory scrutiny of asset valuations should be heightened during such conditions. The evidence also supports ongoing efforts to harness market discipline through increased reliance on uninsured funding (eg subordinated debt), consistent with FSB initiatives related to Total Loss Absorbing Capacity (TLAC) requirements. Findings point to accounting discretion as another possible source of procyclical bank behaviour that may be of interest to policymakers in their ongoing efforts to design macroprudential measures (eg countercyclical capital buffers) aimed at addressing the cyclicality of capital requirements.

3.2.3 Fair value accounting and contagion

Critics of fair value accounting have claimed that it may create or at least intensify contagion between banks, ie that it may aggravate the problem of financial shocks which can easily propagate in a network of banks. This *balance sheet contagion channel* involves a market-wide decrease in asset prices, leading to fair-valued accounting losses. Supervisory and regulatory pressure or funding constraints may then motivate fire sales of financial assets. As this brings about further declines in asset prices, a negative feedback loop between asset prices, fire sales and these constraints may be the consequence.[26] Theoretical

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[26]   See the literature review in BCBS (2015b) pp 3–4.

models (eg Allen and Carletti (2008), Diamond and Rajan (2011)) illustrate this asset fire sales spiral, but empirical evidence is very scarce, either because "circuit breakers" in accounting rules, the option to re-classify assets from the fair value to the historical cost category, prudential filters for regulatory capital or government support measures mitigated this *domino effect*, or because adequate data to analyse these effects is not (yet) available. Furthermore, even if evidence for contagious events were found, it remains unclear whether they can be attributed to the *balance sheet contagion channel* described above, to the existence of *common asset holdings* in multiple banks, or to bilateral direct links through *interbank borrowing and lending*.

The study by Foos and Georgescu (2014) provides new analytical work that addresses the question whether there is contagion risk among large, systemically important banks, and through which channel it spread during the recent financial crisis. More specifically, the effect of *accounting-induced indirect links* (the balance sheet contagion channel) is separated from that of *indirect links through common exposures or common risks* and from that of *direct links* between banks (eg through borrowing and lending on the interbank money market).

Given that there was a widespread view among regulators, politicians and banks during the financial crisis of 2007–2009 that fair value accounting can fuel irrational bubbles in boom periods and amplify downswing movements in bust periods, the authors set up the hypothesis that *fair value accounting leads to contagion*, and they test for this effect using market data on the value of banks' assets that is perceived by outside parties. If market participants assumed that banks had to mark down assets in line with excessively low market prices (eg by using the *ABX* index as a common valuation reference for asset-backed securities), or if they assumed that fair value losses forced banks to engage in fire sales, the co-movement between the market value of banks' assets would indicate contagion risk. However, alternative explanations for this finding include banks' exposures to *common risk factors*, the uncertainty of market participants on the distribution of *toxic* assets (eg subprime exposures or structured products) or the existence of *direct links* between banks through the interbank money market. The aim of this study is to identify the channel(s) through which contagion may have spread during the recent crisis rather than analysing primarily the strength of contagion itself.

Its empirical methodology relies on the assumption that contagion risk was reflected in credit default swap (CDS) spreads of large and interconnected banks. Foos and Georgescu (2014) analyse historical pairwise correlations of CDS spreads empirically and use them as a measure of contagion. After controlling for the impact of direct links, common portfolios (ie exposure to common risk factors) and exposure to certain toxic assets, the authors investigate whether the residual pairwise correlation can be attributed to the balance sheet contagion channel that is linked to fair-valued assets. To illustrate the identification strategy, it is being tested whether the correlation of two banks which both use fair value accounting for a large part of their assets is higher than the correlation of two banks which have similar direct links and similar exposures to common risk factors, but hold a larger part of their assets at historical cost.

In this study, several pairwise measures for banks' reliance on fair value accounting are applied. All of them have in common that they take two aspects into account: the fraction of fair-valued assets over total assets and the similarity of each pair of banks in terms of fair value reliance. The following specific measures are tested:

(i)   Relative shares of the *total fair-valued portfolio* as most comprehensive measure;

(ii)   relative shares of the *structured portfolio held at fair value*, given that this asset class was believed to be most critical during the crisis;

(iii)   the *total structured portfolio held at fair value or amortised cost*. If we identify a contagious effect of this portfolio, it would likely be due to toxic assets as such, rather than their accounting classification; and

(iv)   as a backtest, the *structured portfolio held at amortised cost.* Any impact of this portfolio on bilateral correlations cannot be attributed to fair value accounting but is likely driven by exposure to common risk factors or investors' uncertainty about toxic asset holdings.

As control variables, direct links are measured using credit register data about bilateral exposures relative to total regulatory capital. Furthermore, as a proxy for exposure to common risk factors, Foos and Georgescu (2014) measure the similarity in two banks' portfolios by the *Euclidian Distance* relative to industries or individual borrowers. They correct the estimation for other static bank characteristics using indicator variables at the bank level.

Regression results do *not* reveal consistent evidence for significantly higher CDS spread correlations if two banks are reporting a high fraction of their assets at fair value. More specifically, the authors observe a small and statistically insignificant positive correlation of total fair-valued assets (1) with their measure of contagion, while the relation of the structured portfolio held at fair value (2) may even be reversed. Results regarding the total structured portfolio (3) or its fraction held at historical cost (4) are different. The empirical results indicate a positive and highly significant relation of the latter variables, which are defined independently of fair value accounting, and the measure of contagion risk. This means that investors' uncertainty about banks' structured portfolios and the exposures to common risk factors may have played a more significant role in the context of contagion than the designation of assets at fair value. Finally it is worth noting that Foos and Georgescu (2014) find relatively consistent evidence for a positive relation of both direct links through bilateral exposures and indirect links through portfolio similarity on contagion.

3.2.4   Fair value accounting and prudential filters

Historically, prudential filters have been established as correction factors in the reconciliation of accounting equity into regulatory capital. In this context, under Basel III, the discretionary option to remove from banks' regulatory capital unrealised gains or losses recognised on the balance sheet as other comprehensive income would no longer be available. The Basel III proposal suggests that all unrealised gains and losses currently recognised on the balance sheet as other comprehensive income (OCI) fully increase (gains) or decrease (losses) regulatory capital and, in particular, Common Equity Tier 1 (CET1).

The relevance of this change will be commensurate to the amount of such gains and losses that are to be removed, the majority of which correspond to those arising from AFS securities.[27] On average, 10% of total assets of European banks are held in portfolios that give rise to such gains and losses, while for most jurisdictions, the largest amount of AFS securities (around 80%) are debt securities. As the EU Capital Requirements Regulation is aligned with the Basel III proposal, with the final treatment that unrealised gains are to receive still under discussion, the potential impact of the new approach in EU banks can be rather large.

This proposed new regulatory treatment has prompted a specific research project by Argimón, Dietsch and Estrada (2017), which provides empirical evidence on the impact of the AFS prudential filters on the relative size of bank's AFS portfolio and on regulatory capital, taking advantage of the heterogeneity of treatment of unrealised gains and losses in different EU jurisdictions, for different instruments and across time. The underlying hypothesis is that banks are concerned with regulatory risk in terms of capital requirements, so that the greater uncertainty associated with an unfiltered approach would give rise to larger capital buffers and/or reductions in the proportion of the investment portfolio in the AFS category, the main source of such increased volatility.

Specifically, the study analyses how the so called neutralisation approach, by which neither unrealised gains nor losses in relation to debt instruments are included in capital ratios, affects the size of the AFS portfolio and regulatory capital ratio buffers. Many jurisdictions changed to that approach during

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[27]   OCI also includes gains and losses on cash flow hedges.

the crisis. It also analyses the effect of the asymmetric filter that requires the inclusion of all unrealised losses, but allows a different treatment for gains, on the size of the AFS portfolio and on capital buffers. In particular, under the asymmetric filter the regulator may choose from nil to partial recognition of unrealised gains. Some jurisdictions also changed the proportion of recognised gains during the period of analysis, either as a result of a tax change or of a prudential regulatory decision.

The results obtained using consolidated annual data, publicly provided by SNL, for the period 2005 to 2013 for at most 155 banks of 17 European jurisdictions[28] support the hypothesis that existing AFS filters affected observed capital buffers and investment decisions for European banks. In particular, the study finds evidence that:

- if the AFS filter had been removed from capital during the period 2005 to 2013, so that unrealised gains and losses would have been fully recognised in capital, the changes in capital ratios would have been much larger than those actually observed;

- banks tend to hold a higher proportion of AFS assets in relation to securities valued at fair value if unrealised gains and losses from fixed income securities are neutralised, and thus not recognised in regulatory capital, than if losses are recognised and gains are fully, partially or not recognised at all. It is the inclusion of losses that mainly drives the result. Further,

- regulatory capital ratios are not affected by this neutralisation;

- the size of the proportion of gains that are allowed to be recognised in regulatory capital when losses are fully recognised does not affect the weight that the holdings of AFS assets have on total assets at fair value, and

- observed regulatory capital ratios increase with the proportion of gains allowed to be recognised as own funds, after taking into account the economic environment

From this empirical evidence, it can be concluded that the proposal contained in the Basel III framework to remove all prudential filters of unrealised gains and losses of instruments at fair value may potentially impact banks' capital and portfolio composition.

On the one hand, it might be accompanied by higher volatility in capital ratios. On the other hand, the removal of the possibility of neutralisation may lead to a decline in AFS holdings of debt instruments by banks, most of which are sovereign bonds. Given that in some cases, banks provide a large part of the demand for long-term government securities, a contraction of trading in these markets could result. Moreover, costly changes in liquidity management may also take place with more assets being classified as held to maturity. Some policymakers have picked up this issue in the context of liquidity requirements.[29] Concerns have been raised for the possibility that it could even affect banks' ability to lend. Finally, the full recognition of unrealised gains as own funds will on average result in higher capital buffers. In the current context of declining gains, such higher capital buffers would need to be met with additional capital that will need to be raised or with lower risk weighted assets, thus affecting lending decisions.

Notice however that the higher risk sensitivity that the removal of the AFS filters will impose on banks is not addressed in this research project. Under an unfiltered framework, losses are timely and fully transferred to capital. Therefore, the incentives to accumulate assets that become illiquid as banks try to

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[28] The jurisdictions included are Austria, Belgium, Cyprus, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain and the United Kingdom.

[29] Enria, Farkas and Overby (2016) argue that if large parts of sovereign exposures are still valued at amortised cost, a sale at market prices may not be backed by sufficient regulatory capital to absorb accounting losses. A valuation at amortised cost would be "difficult to justify when a large share the very same sovereign assets is used to comply with the newly introduced liquidity requirements. (...) Therefore as a minimum sovereign assets used to fulfil the LCR requirements should always be measured at fair value, also for accounting purposes" (p 62). Thus, the decline in AFS holdings of debt instruments triggered by a removal of all prudential filters may have undesired side-effects also in this context.

delay the recognition of losses in income until very late, will be removed with the removal of the filters. Further analysis of the impact of the removal of filters on the promotion of sound practices for managing and controlling risk, that could be assessed through their dividend policy, would shed light into the sought for benefits of this approach.

3.2.5 Synthesis of research findings on fair value accounting

As noted above, the empirical results from the three studies presented in this section can only provide partial evidence on the respective aspects and should be seen in the broader context of potential benefits and risks associated with fair value accounting. These studies suggest the following conclusions.

- While **banks' capital ratios** are in general positively associated with their exposure to market discipline, its **negative association to Level 3 assets may indicate opportunistic (moral hazard) behaviour.** This effect is more pronounced during benign economic conditions, but it is dampened if banks have outstanding listed equity or subordinated debt. Further, it is shown that banks' capital ratios fluctuate in line with GDP growth, which indicates that **Level 3 assets may amplify procyclical bank behaviour**.

- **No clear evidence** is found for the hypothesis that **fair value accounting leads to contagion** as measured by correlations in CDS spreads of large banks whereas direct links through bilateral exposures and indirect links through common risk are positively associated with CDS spread correlations. This indicates that **investors' uncertainty about banks' structured portfolios and their exposures to common risks are more important drivers of contagion risk** than the designation of their assets at fair value.

- **Without the prudential filter** for gains and losses in the AFS portfolio, we would have seen much **larger fluctuations in banks' capital ratios**. Further, it is found that **banks hold relatively more AFS assets if both AFS gains and losses are neutralised in their capital** whereas the higher the proportion of gains allowed to be recognised as capital, the higher tend to be banks' capital ratios.

In evaluating these results it should also be borne in mind that all three problems were subject to significant limitations in the scope and quality of empirical data used. Any future availability of more comprehensive or more detailed data sets would provide an opportunity for researchers to immerse themselves more deeply into the interaction of fair value accounting and prudential regulation.

Annex 1: Academic workshop (16–17 October 2014) summary

The work stream on Regulation and Accounting of the Committee's Research Task Force (RTF-RA) organised an academic workshop on 16–17 October 2014 at Deutsche Bundesbank's Conference Centre in Eltville, situated close to Frankfurt. The workshop has been the work stream's main research event, targeted at a distinguished international audience from academia, researchers from policy institutions, and practitioners alike. The **one-and-a-half-day schedule** presented **eleven research projects**, with presenters and discussants from European and North American universities and policy institutions. Details of all presentations and discussions can be found in the workshop programme included with this report. The members of the RTF-RA workstream had already convened one day before the conference to review the current state of their research projects and to discuss further proceedings.

After brief opening remarks by Daniel Foos, the RTF-RA's lead, the conference commenced with a presentation by **David Grünberger** of the Austrian Financial Market Authority. Based on historical ratings data and using a migration model, Grünberger simulates various **impairment rule approaches** under current consideration by standard setters. In his evaluation of their potential impact on bank income and lending, the author concludes that the expected loss approaches "three bucket" or "lifetime loss" do not reduce the cyclicality of accounting income or credit supply in the absence of reliable rating migration predictions. He proposes an alternative approach that incorporates risk weighting into the model and could thereby reduce the volatility of bank profits and lending without compromising accounting transparency.

Trevor Harris of Columbia Business School presented joint work with his co-authors Urooj Khan and Doron Nissim, looking at possible improvements in **estimating expected credit losses** on loan portfolios that would allow for better bank profitability assessments. By combining various non-discretionary measures related to credit risk and included in bank disclosure, the authors' new measure results in better credit loss predictions than other measures currently in use. Interestingly, the new measure is negatively correlated with subsequent stock returns, implying that investors' decisions do not fully incorporate information on expected credit losses, and it contains information not yet captured by loan-loss allowance and provisions.

Fair value accounting and its alleged role in fomenting **contagion** during the 2007–2009 financial crisis was analysed by **Daniel Foos** of Deutsche Bundesbank in joint work with Oana-Maria Georgescu. Given that compelling empirical evidence to support that claim is still largely missing, the authors investigate whether accounting-induced indirect links may have had a significant impact on crisis dynamics. Using pairwise correlations of CDS for German banks as a proxy for contagion risk, their study controls for direct links and common risks among banks but finds little evidence that the remaining correlations are driven by similarity in fair value portfolios.

Within the exact same research strand, **Urooj Khan** of Columbia Business School presented evidence on **whether fair value accounting increases systemic risk in the banking system**. He finds that the extent of fair value reporting is associated with an increase in contagion among banks and that bank contagion increases most severely during periods of market illiquidity. His results also suggest that bank contagion associated with fair value accounting is more likely to spread to poorly capitalised banks and to banks that hold relatively higher positions of fair value assets.

Following the morning sessions of research presentations and a lunch break, **Christian Leuz** of the University of Chicago's Booth School of Business gave a **keynote speech on "The real accounting problems with respect to financial stability: what can we learn from the crisis?"**. Leuz disputed the frequently alleged role of fair value accounting in fuelling crisis dynamics, based on a growing body of empirical evidence. He then turned to elements of current accounting standards that in his view became major issues of concern during the financial crisis. The most relevant aspects in Leuz's view include the incentives created by financial reporting for bank decisions, the interaction between accounting and bank

regulation (eg the banking book – trading book distinction), insufficient disclosure on the funding structure and liquidity gaps of banks as well as the connection between disclosure and market discipline. As the presentation deliberately challenged some widely held beliefs about the role of accounting, it was followed by a particularly lively debate among the audience.

The sessions of research presentations resumed with **Seda Oz** of McGill University taking a closer look at the **impact of FAS 166/167 ("Accounting for transfers of financial assets") on the transparency in financial reporting of securitising banks**. Using the dispersion in analysts' earnings forecasts, implied volatility, stock illiquidity, and bid-ask spreads to measure information uncertainty within a difference-in-difference framework, she finds that securitising banks have experienced a reduction in information uncertainty during the transition from pre- to post-FAS 166/167 periods after 2009 in contrast to non-securitising banks. The reported effect is even stronger if securitising banks consolidate variable interest entities during the periods governed by FAS 166/167.

Also based on a difference-in-difference framework around the **introduction of dynamic loan loss provisioning in Spain** in 2000, **Lars Norden** of the Erasmus University, Manuel Illueca and Gregory Udell investigate the **resulting effect on bank risk taking**. The authors find that banks with high conditional accounting conservatism (eg accounting conservatism linked to current market values) in the pre-adoption period substantially increased their risk exposure in the post-adoption period. These banks experience higher loan growth and lend more to ex ante riskier borrowers and borrowers of lower accounting quality. Pointing to reduced screening and monitoring incentives, the authors conclude that unintended side effects of changing the loan loss provisioning rules for banks can be significant.

The first conference day concluded with an **official dinner at Schloss Vollrads**, a scenic vineyard site in the Rheingau that traces its history back to the 13th century as possibly the oldest winery in Germany. Over dinner, **Andreas Dombret** of the Executive Board of Deutsche Bundesbank gave a speech on **"The more the merrier? Harmonisation and transparency in banking supervision"**, in which he presented his views on the foundations, current role, and limits of harmonisation in Europe with specific reference to the European Banking Union.

The second day of the conference started with a presentation of joint work of **Annelies Renders** of Maastricht University, Peter Fiechter, Wayne Landsman, and Kenneth Peasnell, who look at the **privilege enjoyed by too-important-to-fail (TITF) banks in the face of regulatory pressure**. The amendments to IAS 39 in 2008 allowed banks to reclassify investments from fair value to historical cost, a potential means to better protect Tier 1 capital levels. TITF banks are found to have made significantly less use of this option, which the authors take as evidence that these banks enjoy taxpayer protection that shields them from regulatory pressure. The study's findings turn out to be robust to a number of extensions such as excluding globally systemically important financial institutions from the sample.

Justin Chircop of Lancaster University presented joint work with Zoltán Novotny-Farkas, examining the **likely consequences of implementing a specific element of the Basel III framework in the US market**, viz. the mandatory inclusion of unrealised fair value gains and losses in AFS securities in Tier 1 regulatory capital. Using quarterly data on US banks during 2009–2013, the authors find that the enactment of such a rule would have resulted in a marked increase in the volatility of regulatory capital. Moreover, share prices have reacted negatively to news that raise the likelihood of eventual implementation, with stronger reactions for banks with larger relative amounts of unrealised gains and losses. Interestingly, the study does not observe the costly changes in investment behaviour or reclassification of AFS securities, as asserted by opponents of the new rule, among advanced approaches banks.

In another study focused on the US market, **Christian Laux** of the Vienna University of Economics and Business and Thomas Rauter analyse the **prevalence and determinants of leverage procyclicality** for commercial and savings banks over the period 1990–2013. The authors find bank leverage to be strongly procyclical even after controlling for various economic and bank-specific determinants of leverage. That procyclicality appears not to be driven by marking-to-market but rather through banks'

business expansion with the aim of adjusting their leverage and capital ratios. The authors also find a difference in the drivers of procyclicality depending on whether banks recognise more or less than 20% of their assets at fair value.

Procyclicality is also the topic of **Christian Domikowsky** of the Finance Center Münster, Sven Bornemann, Klaus Düllmann, and Andreas Pfingsten, who look at **the impact of loan loss provisioning on the cyclicality of the loan business** among German banks. By using three different measures of forward-looking provisioning as under an expected loss approach, the authors find that German banks use specific loan loss provisions countercyclically, in particular for earnings management and by anticipating non-performing loans. In contrast, the use of general loan loss provisions appears to be predominantly driven by tax considerations. In a broader context, the findings demonstrate the importance of loan loss provisioning rules for bank behaviour.

In the last research presentation of the workshop, **Jan Riepe** of Tübingen University also looks at different motives for building loan loss provisions. His study exploits the fact that banks face an upper threshold for the amount of loan loss allowances eligible as supplementary regulatory capital. Above that threshold, the capital management motive becomes irrelevant while earnings management and tax incentives remain unaltered, which allows for separate **identification of capital management behaviour** in the data. The author finds significant changes in banks' reporting behaviour around the capital recognition threshold, which points to an important role for the capital management motive. In addition, the study reports stronger capital management activity for banks with weaker market discipline and less incentive-based compensation.

The workshop ended after some closing remarks by Daniel Foos. Informal feedback gathered to date confirms that the conference has been perceived to be of high academic quality and was generally very well-received in terms of its format, the location, and general conference organisation. The organisers were encouraged to organise similar events in the future, which would provide a platform for a regular exchange of academics, practitioners and staff of regulatory and supervisory authorities on the interplay of accounting and regulation.

The interplay of accounting and financial regulation and its impact on bank behaviour

A Joint Workshop of Deutsche Bundesbank and the Research Task Force of the Basel Committee on Banking Supervision

Workshop Programme

Thursday, 16 October 2014

Time	Session	Speaker	Discussion
09:30–09:45:	Welcome / Opening Remarks	Daniel Foos (RTF-RA Lead)	
09:45–10:30:	A Rating Migration Model for Loan Loss Provisions	**David Grünberger (Austrian Financial Market Authority)**	*Discussion:* Michel Dietsch (ACPR, Banque de France)
10:30–11:15	The Expected Rate of Credit Losses on Banks' Loan Portfolios	**Trevor Harris (Columbia Business School),** Urooj Khan, Doron Nissim	*Discussion:* Peter Raupach (Deutsche Bundesbank)
11:15–11:30:	Coffee Break		
11:30–12:15:	Contagion: direct links versus accounting induced indirect links	**Daniel Foos (Deutsche Bundesbank),** Oana-Maria Georgescu	
12:15–13:00	Does Fair Value Accounting Contribute to Systemic Risk in the Banking Industry?	**Urooj Khan (Columbia University)**	*Discussion:* Jannis Bischof (Goethe University Frankfurt)
13:00–14:00	Lunch		
14:00–15:00	Keynote Speech: "The Real Accounting Problems with respect to Financial Stability: What can we learn from the crisis?"	Christian Leuz (University of Chicago Booth School of Business)	
15:00–15:30	Coffee Break		
15:30–16:15	Did FAS 166 and FAS 167 improve the Transparency of Securitising Banks?	**Seda Oz (McGill University Canada)**	*Discussion:* Bill Francis (Bank of England)
16:15–17:00	Conditional Accounting Conservatism and Bank Risk Taking	Manuel Illueca, **Lars Norden (RSM Erasmus University),** Gregory F Udell	*Discussion:* Isabel Argimón (Banco de España)
18:00–21:00:	Dinner / Dinner Speech	Andreas Dombret (Deutsche Bundesbank)	

Friday, 17 October 2014

08:45–9:30:	Why Too-Important-to-Fail Banks in Europe Elected Not to Use the IFRS Option to Reclassify Financial Assets out of Fair Value in 2008	Peter Fiechter, Wayne R Landsman, Kenneth Peasnell, **Annelies Renders (Maastricht University)**	*Discussion:* Justin Chircop (Lancaster University)
09:30–10:15:	The economic consequences of including fair value adjustments to shareholders' equity in regulatory capital calculations	Justin Chircop, **Zoltán Novotny-Farkas (Lancaster University)**	*Discussion:* Peter Fiechter (University of Neuchatel)
10:15–10:30:	Coffee Break		
10:30–11:15:	Pro-cyclicality of US Bank Leverage	**Christian Laux (Vienna University of Economics and Business),** Thomas Rauter	*Discussion:* Nikola Tarashev (Bank for International Settlements)
11:15–12:00:	Loan Loss Provisioning and Pro-cyclicality: Evidence from an Expected Loss Model	**Christian Domikowsky (Finance Center Münster),** Sven Bornemann, Klaus Düllmann, Andreas Pfingsten	*Discussion:* Manuel Illueca Muñoz (Universitat Jaume I)
12:00–12:15:	Short Break / Refreshments		
12:15–13:00:	Capital Management without Earnings Management - Disentangling the managerial reporting incentives	**Jan Riepe (Tübingen University)**	*Discussion:* Günther Gebhardt (Goethe University Frankfurt)
13:00–13:15:	Closing Remarks	Daniel Foos (Deutsche Bundesbank)	
13:15–14:00:	Lunch		

General schedule: 45 minutes for each paper (Presentation 25 + Discussion 10 + Q&A 10)

Annex 2: Project list of the RTF-RA work stream

Title of the project	Contributors	Research questions	Data
Loan loss provisioning models, banks' practices, and procyclicality			
Capital (and earnings) incentives for loan loss provisions in Brazil: evidence from a crisis-buffering regulatory intervention	Ricardo Schechtman (Central Bank of Brazil), Tony Takeda (Central Bank of Brazil)	• How (if any) the recognition of discretionary loan loss reserves as regulatory capital affected banks' provisioning behaviour? • Do banks smooth earnings through loan loss provisions?	• Brazilian banks' balance sheet and regulatory capital data • Credit register data on loan arrears. • Quarterly data, 2005Q2–2013Q3.
Loan Loss accounting rules and bank lending over the cycle: evidence from a global sample	Christian Domikowsky (Finance Center Münster), Daniel Foos (Deutsche Bundesbank), Marcus Pramor (Deutsche Bundesbank)	• How does the loan loss accounting model (incurred loss vs expected loss) affect the cyclicality of bank lending?	• Global index on loan loss accounting rules • Bank-level financial reports from 61 countries • Annual data, 1997–2012
Loan loss provisioning and procyclicality: evidence from (more than) an expected loss model	Christian Domikowsky (Finance Center Münster), Klaus Düllmann (SSM/European Central Bank), Sven Bornemann (Finance Center Münster), Andreas Pfingsten (Finance Center Münster)	• Do banks build their loan loss provisions counter-cyclically? • What is the role of earnings management and prudent provisioning?	• Financial statements and supervisory reports of all German banks • Annual data, 1995–2010
Do banks recognise risky loans too slowly? And, could this increase the cyclicality of loan loss provisioning?	Lewis Gaul (Office of the Comptroller of the Currency)	• Do banks immediately incorporate information in loan spreads about borrower risk into credit ratings? If not, could this have led to procyclical loan loss provisioning in the past?	• Shared National Credit Data • DealScan syndicated loan Data • Compustat, CRSP
Identifying provisioning policies of Belgian banks	Emrah Arbak (National Bank of Belgium)	• Is Belgian banks' loan loss provisioning influenced by non-loss factors and in particular the introduction of IAS 39?	• Quarterly/annual data for 24 banks, covering 1999–2014.

Title of the project	Contributors	Research questions	Data
How do Korean accounting and regulatory regimes interplay and affect Korean banks' behaviour?	Jung Phil Park (Bank of Korea), Jihoon Kim (Bank of Korea), Jee In Jang (Chung-Ang University, KASB/KAI), Joonhei Cheung (Anyang University)	• How is the change in accounting standards intertwined with national supervisory treatments and the Basel Framework on loan loss provisioning? • How do interactions among them affect Korean banks' lending behaviour (in particular, procyclicality of the banks' lending)?	• Financial and regulatory reports (quarterly) of the 17 Korean commercial banks (2001~2014), 83 saving banks (2009~2014) and 20 foreign banks' branches operating in Korea (2001~2014)
Information disclosure, market discipline and bank behaviour			
Accounting discretion, market discipline and bank behaviour: some insights from fair value accounting	Regis Bouther (PRA/Bank of England), William B. Francis (PRA/Bank of England)	• How does accounting discretion affect banks' risk-taking behaviour? • How does accounting discretion affect the influence of market discipline over banks' risk-taking behaviour? • Does this influence depend on economic or market conditions?	• Quarterly regulatory return information for over 600 US bank holding companies for the period 2007Q1 to 2013Q4. • The data include detailed breakdowns on fair value level 1 to 3 assets and liabilities, which are used to proxy relative degrees of accounting discretion.
Fair value accounting and contagion			
Contagion: direct links versus accounting-induced indirect links	Daniel Foos (Deutsche Bundesbank), Oana-Maria Georgescu (European Central Bank)	• What is the impact of fair value accounting-induced indirect links on contagion between banks?	• Financial and regulatory reports and CDS spreads for 14 German banks • Quarterly data, 2006–2010
Accounting and prudential filters			
Prudential filters, portfolio composition and capital ratios in European banks	Isabel Argimón (Banco de España), Michel Dietsch (ACPR/Banque de France), Ángel Estrada (Banco de España)	• What is the impact of the prudential filters referring to unrealised gains and losses on regulatory capital and portfolio composition?	• Public annual individual EU banks data from SNL covering 2005 to 2013 • CEBS (2007) report on prudential filters

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