

No. 591

Günther Gebhardt and Zoltán Novotny-Farkas

## Comparability and predictive ability of loan loss allowances – The role of accounting regulation versus bank supervision

## The CFS Working Paper Series

presents ongoing research on selected topics in the fields of money, banking and finance. The papers are circulated to encourage discussion and comment. Any opinions expressed in CFS Working Papers are those of the author(s) and not of the CFS.

The Center for Financial Studies, located in Goethe University Frankfurt's House of Finance, conducts independent and internationally oriented research in important areas of Finance. It serves as a forum for dialogue between academia, policy-making institutions and the financial industry. It offers a platform for top-level fundamental research as well as applied research relevant for the financial sector in Europe. CFS is funded by the non-profit-organization Gesellschaft für Kapitalmarktforschung e.V. (GfK). Established in 1967 and closely affiliated with the University of Frankfurt, it provides a strong link between the financial community and academia. GfK members comprise major players in Germany's financial industry. The funding institutions do not give prior review to CFS publications, nor do they necessarily share the views expressed therein.

# Comparability and predictive ability of loan loss allowances – The role of accounting regulation versus bank supervision

**Günther Gebhardt**

Goethe University Frankfurt  
[gebhardt@wiwi.uni-frankfurt.de](mailto:gebhardt@wiwi.uni-frankfurt.de)

**Zoltán Novotny-Farkas\***

Lancaster University Management School  
[z.novotny-farkas1@lancaster.ac.uk](mailto:z.novotny-farkas1@lancaster.ac.uk)

March 2018

## **Abstract**

We investigate whether and how the shift from discretionary forward-looking provisioning to the restrictive incurred loss approach under International Financial Reporting Standards (IFRS) in the European Union (EU) affects the *cross-country* comparability and predictive ability of loan loss allowances. Given bank supervisors' keen interest in comparable and adequate loan loss allowances, we also examine the role of supervisors in determining financial statement effects around IFRS adoption. We find that the application of the incurred loss approach has led to more comparable loan loss allowances. However, some differences persist in countries where supervisors were reluctant to enforce the incurred loss approach. Our results also suggest that the predictive ability of loan loss allowances improved following IFRS adoption. Finally, in supplemental analyses we document that increased comparability of loan loss allowances is associated with the cross-country convergence of the risk sensitivity of bank leverage indicating an improvement in the effectiveness of market discipline in the EU.

**Keywords:** comparability, loan loss allowances, IFRS, bank accounting, supervisory intervention

**JEL Classification:** M41, M48, G21

\*Corresponding author. We thank Sudarshan Jayaraman, Max Müller, Jason Xiao and workshop participants at the 2015 MEAFA Meeting at Sydney University, the 2016 summer workshop of the Institute of Economics of the Hungarian Academy of Sciences in Budapest, the 2018 Annual Accounting Conference in Berlin, Católica-Lisbon School of Business & Economics, Lancaster University, Mannheim University, University of Rochester, and Tilburg University for helpful comments.

## 1. Introduction

This paper examines the effects of mandatory International Financial Reporting Standards (IFRS) adoption in the European Union (EU) on the *cross-country* comparability and predictive ability of banks' loan loss allowances.<sup>1</sup> The harmonization of accounting standards and the improvement of comparability of financial statements across EU countries is one of the prime goals of mandatory IFRS adoption and explicitly stated in Article 1 of the EU Regulation 1606/2002. Moreover, in the banking industry, cross-country comparability of financial statements is one of the key criteria along which supranational bank supervisors evaluate accounting standards from a financial stability perspective (ECB 2006; Nouy 2014; BCBS 2015; EBA 2017). The effectiveness of EU wide bank supervision and their tools (such as stress tests) critically hinges upon comparable bank financial statements (ECB 2014). Cross-country comparability facilitates consistent calculation and interpretation of key supervisory ratios and, in turn, the adequate selection of micro- and macroprudential policy responses (Nouy 2014; Gaston and Song 2014). Furthermore, comparable bank accounting enhances the level playing field between banking institutions and strengthens market discipline (ECB 2006).

However, empirical evidence suggests that comparability (and other) benefits of IFRS adoption depend on the compliance with and consistent enforcement of accounting standards (e.g., Barth et al. 2012; Christensen et al. 2013; Cascino and Gassen 2015). In the banking setting, bank supervisors play a key role in the enforcement of accounting rules beyond national securities regulators. While recent papers document beneficial effects of supervisory scrutiny for financial statement transparency (Costello et al. 2016; Bischof et al. 2016), in the context

---

<sup>1</sup> The loan loss allowance is a “stock” measure that reflects bank management’s estimate of future credit losses on its loans outstanding. It can be viewed as a contra asset account that reduces the gross amount of loans on the balance sheet. In contrast, the loan loss provision is a “flow” measure in the income statement reflecting bank managements’ estimate of future credit losses during the period (see e.g. Ryan 2007). As such, the loan loss provision reflects periodical adjustments of the loan loss allowance. Our paper focuses on the loan loss allowance.

of loan loss accounting the objectives of accounting standard setters and bank supervisors are significantly different (Wall and Koch 2000). The restrictive incurred loss approach and detailed guidance under previous International Accounting Standard (IAS) 39 rules reflect accounting standard setters' desire to reduce discretion and to achieve comparable and transparent financial reporting.<sup>2</sup> However, the incurred loss approach is at odds with supervisors' preference for more prudent, forward looking provisioning, which derives from their objective to maintain safety and soundness of the financial system (Wall and Koch 2000; Balla et al. 2012). Consistent with this argument, anecdotal evidence shows that the Spanish supervisor, the *Banco de España*, forced banks to continue with dynamic provisioning even after the introduction of IFRS in 2005 and despite the awareness of this issue by EU institutions overseeing the consistent application of EU laws.<sup>3</sup> Hence, given supervisors' diverging incentives and powers, the IFRS effects on comparability likely depend on supervisors' acceptance of the incurred loss approach.

The tension between standard setters' and supervisors' objectives indicates a potential trade-off between the comparability and predictive ability of loan loss allowances. Specifically, by reducing the room for discretion the restrictive incurred loss approach also limits managers' ability to incorporate private information about future loan losses in determining loan loss allowances (ECB 2006; Dugan 2009). To the extent that bank managers used accounting discretion under previous local rules to incorporate information regarding future expected

---

<sup>2</sup> IAS 39 was applicable from 2005 to 2017 in the European Union. Effective from 1 January 2018, IFRS 9 has replaced IAS 39 and the incurred loss approach. The standard requires more forward-looking recognition of future expected losses.

<sup>3</sup> In April 2009, Charles McCreevy, the former EU Internal Markets Commissioner with the self-proclaimed priority to ensure proper enforcement of Internal Market rules stated: "*The [IFRS] rules did not allow the dynamic provisioning that the Spanish banks did, and the Spanish banking regulator insisted that they still have the dynamic provisioning. ... funnily enough, I should have actually been taking action over the last year on infringements proceedings against the Spanish for allowing the Spanish regulator to not to allow his banks to go IFRS route. I should have been prosecuting him for being responsible and conservative if I'd been thoroughly doing my duty, because all other countries in the EU had adopted IFRS and did it in a proper way. The Spanish regulator said no, and we didn't go down this particular route, ...*" (Emphasis added) (IASB 2009).

losses, the adoption of the incurred loss approach will lead to a decrease in the predictive ability of loan loss allowances. However, if managers exploited discretion opportunistically, then the predictive ability of loan loss allowances might improve following the adoption of IFRS.<sup>4</sup> The anecdotal evidence from Spain further suggests that supervisors likely influence the way that managers use accounting discretion.

The EU setting offers several advantages to examine these questions. First, before IFRS adoption local accounting rules allowed significant discretion to incorporate forward-looking judgements into loan loss allowances, but the extent and nature of discretion varied significantly across EU countries. The shift to the restrictive incurred loss approach provides a powerful setting to detect changes in loan loss accounting practices (e.g., Gebhardt and Novotny-Farkas 2011). Second, the diversity of loan loss accounting practices across EU countries is largely attributable to the varying extent national bank supervisors intervene into bank accounting. Three countries (Denmark, Portugal, Spain) stand out particularly in that their national bank supervisors have the authority to set accounting standards for banks, but their loan loss accounting approaches differed significantly before IFRS adoption. The Danish supervisor relied on a principles-based approach and required a “mark-to-market” type of accounting for loans. In contrast, the Portuguese and Spanish supervisors followed a rules-based approach and stipulated statistical and dynamic loan loss provisioning, respectively. This institutional variation allows us to investigate whether and how different supervisory approaches (principles-based versus rules-based) and supervisory (non-)acceptance of IFRS affect the comparability and predictive ability of loan loss allowances.

We employ two empirical methods to measure cross-country comparability. First, we test whether coverage ratios (loan loss allowances divided by non-performing loans), which are

---

<sup>4</sup> Bushman and Williams (2012) provide evidence that discretion used for income smoothing dampens discipline over risk taking, consistent with diminished transparency. In contrast, accounting discretion reflecting the recognition of future expected losses is associated with improved risk-taking discipline.

key inputs in supervisory risk assessments (Gaston and Song 2014) and in ratings (Beatty and Liao 2011), become more comparable across EU countries. To this end, we compare the distributional characteristics (i.e., range, interquartile range and standard errors) of and pairwise (country-by-country) differences in median coverage ratios from the pre-IFRS period with those in the post-IFRS period. If IFRS adoption leads to more comparable loan loss accounting, we should observe a decrease in the cross-country variability and in the pairwise differences of coverage ratios. Second, using regression analysis we measure the extent to which country factors (fixed effects) explain variation in loan loss allowances beyond firm-specific and macroeconomic credit risk measures. In principle, loan loss allowances should be primarily determined by measures of credit risk such as non-performing loans and charge-offs (see, e.g., Beatty and Liao 2014). However, in an international sample of banks, because of cross-country differences in local GAAP rules and institutional arrangements, country factors (such as bank supervision) are also likely to contribute to the cross-country variation of loan loss allowances. If IFRS adoption leads to more comparable accounting then we should observe, on average, a reduction in the influence of country factors on loan loss allowances.

To capture supervisors' acceptance of the incurred loss method in the three interventionist countries, Denmark, Portugal and Spain, we conduct a *de jure* analysis of these supervisors' regulations regarding the implementation of IAS 39. We find that the Danish supervisor accepted the primacy of IFRS from 2005 onwards. In contrast, the Portuguese supervisor applied adjustments to IFRS impairment provisions, while the Spanish supervisor essentially required the continuation of dynamic provisioning under the IFRS label. Based on these insights, convergence of loan loss accounting is more (less) likely in supervisory regimes that (are reluctant to) accept the incurred loss approach.

To examine the predictive ability of loan loss allowances we follow prior literature and measure the association of loan loss allowances with future charge-offs (Altamuro and Beatty

2010; Beck and Narayanamoorthy 2013). This measure is also in line with the Securities and Exchange Commission's (SEC) Staff Accounting Bulletin (SAB) 102 that considers a loan loss allowances methodology as valid when it is able to predict actual subsequent charge-offs.

Using a sample of 89 banks from 12 EU countries over the period from 2000 to 2008, we find an increase in the comparability of banks' loan loss allowances following the mandatory adoption of IFRS. Specifically, we first document a significant reduction in the cross-country variation and pairwise (country-by-country) differences of coverage ratios following the accounting switch. Second, in our regression analysis, we find that while country fixed effects increase the explanatory power of our loan loss allowance models by about 18 percent under local GAAP, their incremental adjusted  $R^2$  declines significantly to about 6 percent in the period after the adoption of IFRS. Consistent with Danish supervisors' acceptance of IFRS, we find that Danish banks reverse more of their "excess" loan loss allowances than banks from non-interventionist economies and their coverage ratios become more comparable with those of other EU banks.<sup>5</sup> In contrast, the IFRS effect on loan loss allowances and coverage ratios is attenuated in Portugal and Spain, where supervisors were reluctant to enforce the incurred loss approach.

In additional cross-sectional analyses, we use *bank-specific* IFRS transition effects, i.e., the differences between IFRS and local GAAP loan loss allowance amounts in the IFRS adoption year, to partition our sample into banks with small versus large transition effects. In essence, the transition effects proxy for the revealed differences between banks' prior provisioning practices and the incurred loss approach. We find that the incremental explanatory power of country fixed effects decreases more in the large transition subsample, but remains virtually unchanged in the small transition subsample. These cross-sectional findings mitigate

---

<sup>5</sup> We use the term "non-interventionist" to refer to national supervisors that do not have the authority to set accounting standards and includes the supervisors from Belgium, Finland, France, Greece, Ireland, Italy, Netherlands, Sweden, United Kingdom.

concerns that unobserved economic trends such as increased internationalization of sample banks and/or increased market integration drive our results rather than the switch to IFRS.

Next, we provide evidence that the association of loan loss allowances with future charge-offs has improved following IFRS adoption. Moreover, we find that before IFRS adoption loan loss allowances in statistical and dynamic provisioning regimes (Portugal and Spain) exhibit a significantly higher association with future charge-offs than in non-interventionist regimes. Interestingly, loan loss allowances under “mark-to-market” accounting in Denmark do not have a higher predictive ability than in non-interventionist countries. The former finding suggests that a more formal rules-based approach for forwarding looking provisioning can improve the predictive ability of loan loss allowances. In contrast, the latter result indicates that, under the more principles-based accounting system, Danish banks did not use their discretion to incorporate future expected losses, but rather to build “buffers” (e.g., Danmarks Nationalbank 2006, p. 27). After IFRS adoption, we do not find differences in the predictive ability of loan loss allowances across different supervisory regimes.

In supplemental tests, we investigate whether greater comparability of loan loss allowances provides benefits for market discipline. Market discipline is one of the main pillars of the Basel regulatory framework and of effective bank supervision (see, e.g., BCBS 2006). Transparent disclosures facilitate the risk assessment and disciplining of banks by market participants. Bushman and Williams (2012) show that cross-country variation in loan loss accounting practices, capturing variation in bank transparency, are associated with differences in the effectiveness of market discipline. We, in turn, expect increased loan loss allowance comparability to level the playing field among market participants and reduce cross-country variation in the strength of market discipline, as measured by the sensitivity of bank leverage to changes in asset risk. We document that the country-level risk sensitivities of leverage converge following the adoption of IFRS and this convergence is significantly associated with

country-level IFRS transition effects on loan loss allowances. While descriptive in nature, this evidence is indicative of a positive association of comparable loan loss accounting and the effectiveness of market discipline in the EU.

We contribute to the literature in several ways. First, we complement extant literature examining the effects of IFRS adoption on the comparability of financial statements (e.g., Barth et al. 2012; Cascino and Gassen 2015) by providing evidence that comparability of banks' loan loss accounting has increased across EU countries. Second, we complement recent literature examining the impact of supervisory scrutiny on financial reporting outcomes in banks (Costello et al. 2016; Bischof et al. 2016; Nicoletti 2017). We show that local supervisory incentives and intervention can impede compliance with and consistent application of accounting standards (Ball 2006). As such, our findings highlight the importance of recent efforts of supranational bank supervisors and organizations (e.g., European Banking Authority (EBA); Basel Committee of Bank Supervision (BCBS)) to ensure consistent supervisory practices in the implementation of the newly introduced expected loss approach under IFRS 9.<sup>6</sup> Third, our paper also complements studies examining the effect of changes in internal control regulation (Altamuro and Beatty 2010) and SEC intervention (Beck and Narayanamoorthy 2013) on the informativeness of loan loss allowances. Consistent with these studies, we document that a tightening of loan loss accounting rules can improve the predictive ability of loan loss allowances for future charge-offs. This finding casts doubts over whether the more discretionary IFRS 9 expected loss approach will ultimately improve the informativeness of loan loss allowances. Finally, we document a previously unexplored benefit of greater cross-country comparability, namely its positive association with the effectiveness of market discipline.

---

<sup>6</sup> In anticipation of the EU-wide adoption of IFRS 9, the BCBS issued guidance for banks and bank supervisors on the implementation and ongoing application of expected credit loss accounting (see BCBS 2015). The EBA issued a largely similar guidance for bank supervisors to promote consistent application and interpretation of the IFRS 9 expected loss rules within the EU (EBA 2017).

The remainder of the paper is structured as follows. Section 2 provides the institutional background and discusses the related literature. Section 3 develops the hypotheses. Section 4 describes the sample and data. Section 5 presents the research design and the empirical results. Section 6 examines potential benefits of increased comparability of loan loss allowance for effectiveness of market discipline. Section 7 concludes.

## **2. Institutional background and related research**

### ***2.1. Institutional background***

#### **2.1.1. Harmonization efforts in the European Union and loan loss provisioning**

Before the mandatory adoption of IFRS, several regulations including the *European Economic Community (EEC) Fourth Directive (78/660/EEC)*, the *Seventh Directive (83/349/EEC)*, and in particular, the *Bank Accounts Directive (86/635/EEC)* aimed at harmonizing bank accounting rules within the EU. According to the *Bank Accounts Directive* loans had to be recognized at their nominal value. To recognize deteriorations in the creditworthiness of individually identifiable debtors bank had to set aside specific loan loss allowances. In addition, banks were required to create general loan loss allowances to cover latent risks inherent in the performing loan portfolio. However, especially the implementation of this forward-looking component of loan loss allowances varied widely across EU countries due to different tax incentives and regulatory capital treatments of general loan loss allowances (e.g., Gebhardt and Novotny-Farkas 2011). Moreover, important to our study, in some EU countries bank supervisors were strongly involved in the design of loan loss accounting rules (see Section 2.1.2 for a more detailed discussion).

Since 2005 publicly traded EU companies are required to apply IFRS for their consolidated financial statements. Article 1 of the EU Regulation 1606/2002 (the IAS Regulation) motivates the mandatory introduction of IFRS as a means “to ensure a high degree

of transparency and comparability of financial statements and hence an efficient functioning of the Community capital market and of the Internal Market”. The International Accounting Standards Board’s (IASB) Conceptual Framework describes comparability as “the qualitative characteristic that enables users to identify and understand similarities in, and differences among, items” (IASB 2010, QC 21). The IASB aims to achieve comparability through consistency (IASB 2010, QC 22) and through the elimination of alternative accounting methods.

To ensure consistent loan loss accounting IFRS provide significantly more (specific) guidance on the timing of loan loss recognition and on measurement than most prior local accounting rules. IAS 39 paragraph 59 requires the recognition of loan losses only if there is objective evidence that a credit event has occurred as of the balance sheet date, i.e., that a loss has been incurred.<sup>7</sup> Paragraph 59 provides a non-exclusive list of loss events that may constitute ‘objective evidence’ (e.g., significant financial difficulty of the borrower, default or delinquency in interest or principal payments). Importantly, unlike under prior local accounting rules, general loan loss provisioning for unspecified credit risks or the anticipation of expected credit losses due to future events are not allowed under the IAS 39 rules.<sup>8</sup> The restriction to incurred losses aims at curbing the room for managerial discretion that has been widely used for income smoothing and regulatory capital management (for an overview see Beatty and Liao 2014). Furthermore, IAS 39 paragraph 63 specifies that if a loss has been incurred, “the amount of the loss is measured as the difference between the asset’s carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not been incurred) discounted at the financial asset’s original effective interest rate”. Before the introduction of IFRS, some countries used the sum of undiscounted cash flows to determine loan loss

---

<sup>7</sup> IAS 39 was in force until 31.12.2017 and has been replaced by IFRS 9 effective from 01.01.2018.

<sup>8</sup> See IAS 39 Implementation Guidance paragraph E.4.6.

allowances, while others discounted future cash flows using the market interest rate (Gebhardt and Novotny-Farkas 2011).

### 2.1.2. The role of supervisors in loan loss accounting

Bank regulators and supervisors rely heavily on reported accounting amounts when calculating and monitoring banks' regulatory capital adequacy. From their perspective, loan loss allowances should cover future expected credit losses while regulatory capital should protect banks from unexpected losses (Wall and Koch 2000). Insufficient recognition of unrealized expected losses through loan loss allowances create loss overhangs that compromise the ability of banks' capital to absorb unexpected losses during downturns, when previously unrecognized expected losses materialize (Bushman 2016).<sup>9</sup>

To ensure adequate (loan loss) accounting supervisors scrutinize reported bank financial statements and intervene if necessary. Appendix A shows that the nature and degree of supervisors' influence on bank accounting in general and loan loss accounting in particular varies across the twelve EU jurisdictions of our sample. In most countries, supervisors have the right to meet and discuss with auditors their report and in about a half of the sample countries supervisors may even take legal action against auditors. While in most countries supervisors can give mere recommendations on accounting issues, Denmark, Portugal, and Spain stand out because their supervisory authorities are involved in accounting standard setting. The remaining columns of Appendix A show to what extent supervisors intervene in loan classification and provisioning.

According to the information summarized in Appendix A, we broadly classify loan loss accounting regimes into interventionist and non-interventionist approaches. The interventionist

---

<sup>9</sup> Supervisors' preference for more conservative loan loss accounting stems from their asymmetric loss function. Specifically, understated loan loss allowances (overstated regulatory capital) may increase the probability of a bank failure and increase the cost imposed on deposit insurance systems, and ultimately tax payers. In contrast, overstated loan loss allowances do not impose costs to supervisors (Benston and Wall 2005).

countries include Denmark, Portugal and Spain. These countries further differ in the nature of intervention. In Portugal and Spain supervisors relied more on formal rules and required so-called statistical and dynamic provisioning, respectively, under which loan loss provisions have to be recognized for every newly issued loan based on a formulaic approach. In contrast, the Danish regulator applied a more principles-based approach under which banks were required to write down loans to their market value (see also Bernard et al. 1995). Finally, the non-interventionist regimes (e.g., Ireland, United Kingdom (UK)) generally do not interfere with banks' loan loss accounting. Appendix B provides a detailed description of the loan loss accounting rules of the three interventionist countries and the UK as a representative example of non-interventionist supervisory approach.

An interesting question is whether interventionist supervisors enforce the IFRS impairment rules given that the incurred loss approach clearly collides with regulators' preference for forward looking provisioning. The last column in Appendix A indicates that while Denmark and all the non-interventionist countries accept IFRS impairment provisions without adjustments for regulatory purposes, this is not the case in Spain and Portugal. To investigate this further, we gather more information on the rules and regulations that were in place in these countries before and after IFRS adoption (see Appendix B for a more detailed discussion). Our *de jure* analysis reveals that while all three supervisors implemented the IFRS impairment provisions, Portugal and Spain issued additional regulatory documents that are aimed to provide strong disincentives for banks to decrease the level of loan loss provisions. In fact, in Spain, the *Banco de España* issued a specific guidance on how to estimate loan losses according to the IFRS rules which in essence requires banks to maintain the previous dynamic provisioning. These supervisory measures raise concerns about the enforcement and proper application of IFRS. In contrast to the Spanish and Portuguese regulators, the Danish supervisor accepted the primacy of IFRS. Specifically, the *Danish Financial Supervisory Authority* noted

that “the rules for recognition of impairment losses/provisions laid down in the IAS standards and implemented in the Danish regulation give a sufficient measurement of banks’ asset quality” (IMF, 2007, p. 27).

## **2.2. Related research**

Our study is related to three streams of the accounting literature. First, there is a surprisingly small literature *directly* investigating the effects of IFRS adoption on cross-country comparability of financial statements.<sup>10</sup> Generally, findings of comparability studies are mixed (see e.g., reviews by Brüggemann et al. 2013; Singleton-Green 2015).

Barth et al. (2012) examine whether accounting amounts of an international sample of non-US firms become more comparable with those of US GAAP firms following the adoption of IFRS. They find that IFRS adoption leads to greater earnings and value relevance comparability between non-US and US firms. Barth et al. (2012) also document that comparability is greater for firms that adopt IFRS mandatorily, firms in common law and high enforcement countries, and in more recent years. Yip and Young (2012) obtain similar findings for a sample of 17 European countries and three different proxies for comparability (the similarity of accounting functions that translate economic events into accounting data, the degree of information transfer, and the similarity of the information content of earnings and of the book value of equity). In contrast, using an international sample of firms and a set of alternative comparability measures Cascino and Gassen (2015) show that the overall comparability effect of IFRS is modest. They further document that comparability increases

---

<sup>10</sup> Several studies attempt to deduce comparability effects indirectly from capital market consequences of IFRS adoption. For example, using the EU setting Yu (2010) and DeFond et al. (2011) infer comparability benefits of IFRS adoption from greater cross-border equity investments by international mutual funds. Ozkan et al. (2012) and Wu and Zhang (2010) attribute increases in pay-performance sensitivities in EU countries and in the use of accounting performance of foreign peers for relative performance evaluation after IFRS adoption to greater financial statement comparability. Young and Zeng (2015) find improved valuation performance of pricing multiples in a sample of EU countries following the switch to IFRS, which they also attribute to enhanced reporting comparability.

only for firms with stronger incentives to comply with IFRS and in countries with stronger enforcement regimes.

To our knowledge, our study is the first to investigate the effects of IFRS adoption on financial statement comparability of banks.<sup>11</sup> Furthermore, we focus on measuring the comparability of a specific accounting item that reflects an individual economic outcome, the measurement of credit risk, rather than aggregate accounting measures of economic outcomes such as earnings and book value of equity (e.g., De Franco et al. 2011; Barth et al. 2012; Yip and Young 2012; Young and Zeng 2015). A potential concern particularly with studies attempting to measure the impact of IFRS on summary accounting measures is that divergent comparability effects for different accounting items in different countries might offset each other because of initial differences between local GAAP and IFRS (Singleton-Green 2015).

Secondly, our paper relates to recent studies examining the role of bank supervisions in the financial reporting quality of banks. Costello et al. (2015) study the effect of regulatory leniency on the likelihood of income-decreasing restatements in US banks. They show that greater regulatory leniency is associated with lower likelihood of income-decreasing restatements. Bischof et al. (2016) document that enforcement of Pillar 3 disclosure requirements by strict supervisors leads to increased risk disclosures of an international sample of banks. These findings suggest potential benefits of supervisory intervention for banks' financial reporting transparency. Nicoletti (2017) examines how diverging incentives of auditors (who want to avoid misstatements of loan loss allowances) and bank supervisors affect loan loss provision timeliness of US banks. Generally, she finds that regulatory scrutiny and external audits are each positively associated with loan loss provision timeliness, relative to a benchmark group of unaudited banks subject to lower regulatory scrutiny. However, banks

---

<sup>11</sup> In their additional analyses, Barth et al. (2012) find improvements in comparability in Finance, Insurance, and Real Estate firms. However, financial reporting practices of the industries included in this industry group are substantially different. Our study focuses specifically on banks.

subject to both greater regulatory scrutiny and external audits banks recognize less timely loan losses compared to unaudited banks, consistent with a conflict between auditors and regulators. Our paper complements these studies by investigating whether supervisors' preference for forward looking provisioning hinders the consistent application of the incurred loss approach and, in turn, compromises the objective of comparable financial reporting.

Thirdly, our study relates to studies examining the effect of tighter regulations and accounting rules on loan loss accounting. Altamuro and Beatty (2010) document that internal control provisions mandated by the Federal Depository Insurance Corporation Improvement Act (FDICIA) increased loan loss provision validity of US banks, as measured by the association of current period loan loss provisions with next period charge-offs. Beck and Narayanamoorthy (2013) examine the impact of SEC intervention through the issuance of Staff Accounting Bulletin (SAB) 102 on the informativeness of loan loss allowances, as measured by their association with future charge-offs. SAB 102 intended to curb alleged overstatements of loan loss allowances to create cookie jar reserves and "to promote a more disciplined and consistent loan loss methodology" (Beck and Narayanamoorthy 2013, p. 43). The authors find that following the issuance of SAB 102 informativeness of loan loss allowances has improved. We complement these studies by providing international evidence on how the switch from different forward-looking regimes to the more restrictive incurred loss approach affects the predictive ability of loan loss allowances. Moreover, we document the role of supervisory intervention in influencing the predictive ability of loan loss allowances.

### **3. Hypotheses**

#### ***3.1. IFRS adoption and comparability of loan loss allowances***

We expect that loan loss allowances are more comparable after mandatory IFRS adoption. We base our prediction on the arguments in Section 2.1 that IAS 39 removes the cross-country

differences in recognition and measurement rules and limits the room for accounting discretion. Consistent with reduced discretion, Gebhardt and Novotny-Farkas (2011) document significantly less income smoothing through loan loss provisions in EU banks after mandatory IFRS adoption. Although this finding provides support for our prediction, it does not provide direct evidence on the comparability of loan loss allowances. Unlike most prior studies, we focus on loan loss allowances, rather than loan loss provisions for two reasons. First, supervisors, managers and auditors typically take a balance sheet, rather than income statement, perspective when evaluating the adequacy of the allowance account (Beaver and Engel 1996; Beck and Narayanamoorthy 2013). Second, the loan loss allowance reflects the cumulative effect of previous over- or under-reserving, while loan loss provisions merely capture periodical adjustments of the loan loss allowance. Therefore, the impact of IFRS adoption is likely to be more significant for the loan loss allowance. Specifically, we formulate the following hypothesis:

**H1: The mandatory adoption of IFRS increases the cross-country comparability of loan loss allowances.**

### ***3.2. Cross-sectional predictions – the role of supervisory intervention***

If IFRS adoption leads to greater cross-country comparability as predicted in H1, one would expect banks from countries with more forward-looking provisioning under previous local rules to make more significant changes to their loan loss accounting around the adoption of IFRS. In Section 2.1.2, we identified three countries (Denmark, Portugal and Spain) where supervisors explicitly required forward looking provisioning. Banks in these countries are likely to have built up significant reserves prior the adoption of IFRS that are not consistent with the incurred loss approach. Consequently, we predict that the reduction of these “excess” loan loss allowances will be more significant upon IFRS adoption in these countries, thus, leading to the following hypothesis:

**H2a: The mandatory adoption of IFRS leads to more pronounced reductions in over-reserving for banks from more forward-looking provisioning regimes (Denmark, Portugal, Spain).**

Because, in principle, market value accounting involves the most comprehensive incorporation of expected losses, conditional on compliance with the IFRS rules, we expect to observe the most significant decrease in loan loss allowances for banks in Denmark.

A maintained assumption underlying H1 and H2a is that banks comply with the new impairment rules. However, recent studies provide evidence that comparability (Barth et al. 2012) and capital market benefits of IFRS adoption (Christensen et al. 2013) vary with the level of enforcement. On average, we expect that IFRS rules are properly enforced within the banking industry because in addition to auditors and securities market regulators, bank supervisors also scrutinize bank financial statements. Nevertheless, the discussion in Section 2.1.2 suggests that in some interventionist countries bank supervisors appear to deviate in the implementation of the incurred loss approach, which might result in a less pronounced change in loan loss accounting. Therefore, we formulate the following alternative hypothesis to H2a:

**H2b: The mandatory adoption of IFRS leads to less significant changes in loan loss allowances for banks in countries where supervisors were reluctant to enforce the IFRS incurred loss approach (i.e., Spain and Portugal).**

### ***3.3. Predictive ability***

While our previous hypotheses predict an increase in comparability, an important question is how IFRS adoption affects the predictive ability or informativeness of loan loss allowances. In theory, an expected loss approach allows for an earlier recognition of future expected losses.

In turn, a switch to an incurred loss approach would imply a decrease in predictive ability. However, an expected loss approach provides greater room for discretion. On the one hand, discretion facilitates the incorporation of information about future expected losses; on the other hand, it also provides room for opportunistic accounting behaviour by bank management (Bushman and Landsman 2010). Bushman and Williams (2012) examine variation in loan loss provisioning practices across countries and document that banks in high discretion regimes do not necessarily impound more forward-looking information. In addition, given that the incurred loss approach relies more on past events, the probability of an actual loss in the short term is higher. Therefore, if the incurred loss model is consistently applied, we might observe improvements in the predictive ability of loan loss allowances after the adoption of IFRS. Consistent with this argument, Beck and Narayanamoorthy (2013) find that a similar tightening of loan loss accounting rules by SAB 102 increased the association of loan loss allowances with future charge-offs. Considering the opposing arguments we formulate the following non-directional hypothesis:

**H3: The predictive ability of loan loss allowances does not change after the mandatory adoption of IFRS.**

#### **4. Sample selection and descriptive statistics**

##### ***4.1. Sample selection***

To select our sample we start with the population of listed banks in the 15 “old” EU member states. We exclude Germany and Austria from our sample, because most listed banks in these countries adopted IFRS voluntarily before 2005, the year of mandatory IFRS adoption.

In addition, these early adopters experienced several revisions in the IFRS impairment rules, which resulted in a step-by-step adoption of the incurred loss approach.<sup>12</sup>

We also exclude Luxembourg from our analyses because its banks are all subsidiaries of bank holding companies already included elsewhere in our sample. For the remaining twelve EU countries, we identify 118 listed banks. We lose 15 banks whose financial statements are not available from their websites, or not available in English. Further, we exclude seven subsidiaries that operate in the same sector as their parent and six banks for which lending is not their main business and two banks because of insufficient data. Our final sample consists of 89 mandatory IFRS adopters.

We download the financial statements from the websites of the banks for the period from 2000 to 2008 and manually collect the relevant financial statement data. Hand-collection was necessary, as most of the key variables (i.e., non-performing loans and loan loss allowances) were rarely available in commercial databases for European banks in the period before the mandatory adoption of IFRS. The choice of the sample period is partly driven by the goal to have a relatively comparable number of observations before and after IFRS adoption and partly by the costs of hand collection. We do not extend the sample period beyond 2008 because (1) several of our sample banks failed shortly after 2008 and (2) bank supervisors in several crisis-affected countries might have taken idiosyncratic, potentially unobservable measures to intervene into banks' loan loss accounting.

Table 1 presents the sample distribution by country and bank specialization for the period before and after IFRS adoption respectively. The majority of the sample represents commercial banks. The sample is relatively balanced with 363 pre-IFRS and 325 post-IFRS adoption

---

<sup>12</sup> See also Gebhardt and Novotny-Farkas (2011).

observations, respectively. The actual number of observations used in the multivariate analyses varies depending on the specification used.

{Insert Table 1 here}

#### ***4.2. Descriptive data analysis***

Table 2 reports descriptive statistics for the variables used in the multivariate analyses for the pre- and post-IFRS adoption period separately. Table 2 suggests that banks set aside significantly less loan loss allowances in the period after IFRS adoption, although the indicators of credit risk increase. For example, the *Coverage ratio*, computed as loan loss allowance (*LLA*) divided by non-performing loans (*NPL*), decreases from 1.542 (0.759) in the mean (median) before IFRS adoption to 1.071 (0.640) after IFRS adoption. The decrease in the coverage ratio is attributable to both a decrease in loan loss allowances and a concurrent increase in non-performing loans around the accounting switch. Gross charge-offs (*GCO*) which represent actual loan losses remain almost unchanged with mean (median) 0.4% (0.3%) before and 0.4% (0.2%) after IFRS adoption. Overall, Table 2 indicates that under the incurred loss approach of IFRS banks recognize lower loan loss allowances despite higher level of (expected) credit risk as indicated by higher *NPL* and higher *Loans*.

{Insert Table 2 here}

### **5. Empirical analyses and results**

#### ***5.1. Comparability of loan loss allowances***

We start our analysis by examining changes in the distributional characteristics of coverage ratios before and after IFRS adoption. The coverage ratio is a key indicator used by

supervisors to assess the adequacy of loan loss allowances.<sup>13</sup> Cross-country comparability of coverage ratios is essential for effective international bank supervision (Gaston and Song 2014). Similar to the approach taken by Plumlee et al. (2017) we examine whether the (interquartile) range and the cross-country variation of median coverage ratios decreases after the adoption of IFRS.

{Insert Fig. 1 here}

Figure 1 plots the variation of coverage ratios by year. Figure 1 provides a first indication of a marked decrease in the dispersion of coverage ratios from 2005, the year of the mandatory introduction of IFRS. Table 3 Panel A shows the median coverage ratios by country for the pre- and post-IFRS periods separately, while Panel B provides the distribution statistics for median country-level coverage ratios. Panel B reveals that the range, interquartile range and the standard error decrease in the post-IFRS period indicating an increase in the cross-country comparability of coverage ratios. Panel C shows the distribution of the absolute magnitude of pairwise (country-by-country) differences in median coverage ratios. Specifically, we compute for each country-pair the difference in their median coverage ratios.<sup>14</sup> Panel C documents sizeable decreases in the range, interquartile range and standard errors of pairwise differences in coverage ratios after IFRS adoption. The lower part of Panel C indicates that the decreases

---

<sup>13</sup> The EBA regularly publishes the development of key risk indicators, including country-average levels of non-performing loans and coverage, for EU banks on its Risk Dashboard (<http://www.eba.europa.eu/risk-analysis-and-data/risk-dashboard>).

<sup>14</sup> For example, consider only three countries, Belgium (BE), Denmark (DK) and Finland (FI), and the median coverage ratio for each country, from both the pre-IFRS period and from the post-IFRS period (see also Plumlee et al. 2017). The coverage ratios could be labelled *CoverageBEPRE*, *CoverageDKPRE*, and *CoverageFIPRE* in the pre-IFRS period and *CoverageBEPOST*, *CoverageDKPOST*, and *CoverageFIPOST* in the post-IFRS period. The pairwise calculation for the pre-IFRS period would include *CoverageBEPRE - CoverageDKPRE*, *CoverageBEPRE - CoverageFIPRE*, and *CoverageDKPRE - CoverageFIPRE* and for the post-IFRS period *CoverageBEPOST - CoverageDKPOST*, *CoverageBEPOST - CoverageFIPOST*, and *CoverageDKPOST - CoverageFIPOST*. We test whether the mean and the median of the pre-IFRS pairwise differences (*CoverageBEPRE - CoverageDKPRE*, *CoverageBEPRE - CoverageFIPRE*, and *CoverageDKPRE - CoverageFIPRE*) is greater than the mean and median of the post-IFRS pairwise differences (*CoverageBEPOST - CoverageDKPOST*, *CoverageBEPOST - CoverageFIPOST*, and *CoverageDKPOST - CoverageFIPOST*).

in pairwise differences are also statistically significant at less than the 1% level. Taken together, the results in Table 2 are consistent with an increased cross-country comparability of coverage ratios, and by implication of loan loss allowances, after the adoption of IFRS.

{Insert Table 3 here}

Next, we conduct a more formal test of the comparability of loan loss allowances. Our approach to measure comparability relies on the differences in the explanatory power of models to explain variation in banks' loan loss allowances. In principle, time and firm-specific variation in loan loss allowances should be primarily driven by a clearly defined set of observable economic factors, i.e., proxies of credit risk like the volume of loans, nonperforming loans and charge-offs (see Beatty and Liao 2014). However, as mentioned above, in an international sample of banks country factors such as differences in local provisioning rules and institutional arrangements are also likely to play a significant role in the determination of loan loss allowances. If IFRS adoption leads to more comparable loan loss accounting then we should observe a significant reduction in the incremental explanatory power of country fixed effects in a regression of the loan loss allowance on its firm-specific and macro-economic determinants. Specifically, to test the comparability of the loan loss allowance we estimate the following regressions:

$$LLA_{itj} = \beta_0 + \beta_1 NPL_{itj} + \beta_2 GCO_{itj} + \beta_3 Loans_{itj} + \beta_4 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \beta_6 \Delta Unemployment_{itj} + Bank\ specialization\ dummies + \varepsilon_{it} \quad (1a)$$

$$LLA_{itj} = \beta_0 + \beta_1 NPL_{itj} + \beta_2 GCO_{itj} + \beta_3 Loans_{itj} + \beta_4 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \beta_6 \Delta Unemployment_{itj} + Bank\ specialization\ dummies + Country\ Dummies + \varepsilon_{it} \quad (1b)$$

where  $LLA_{itj}$  is the loan loss allowance scaled by total loans outstanding of bank  $i$ , in country  $j$  at the end of year  $t$ .  $NPL_{itj}$  is non-performing loans scaled by total loans outstanding, while  $Loans_{itj}$  is total loans outstanding scaled by total assets.  $GCO_{it}$  is current year's gross charge-

offs scaled by average loans outstanding for the year. The variables on the right hand side of the above equations are considered as (relatively) non-discretionary measures of credit risk (e.g., Beatty and Liao 2014). We also include *GDP Growth* and the *Unemployment* rate to control for macroeconomic factors affecting credit risk in loan portfolios. We predict the coefficients on all firm- and macro-level credit risk variables to be positive. *Bank specialization* dummies capture whether a bank is a commercial, cooperative, savings, real estate bank or a bank holding company and proxy for different business models.

As outlined in Section 2, previous local loan loss accounting rules varied in the extent they allowed or even required to provide for future expected losses. Before IFRS adoption these country-specific differences are likely to have lead to a relatively large proportion of unexplained variation, and in turn, lower  $R^2$  of the base model (1a) in a pooled international sample. In turn, the addition of country dummies is expected to yield an increase in  $R^2$ . If the switch to IFRS leads to more comparable loan loss accounting we should observe the following: First, for the basic specification (1a)  $R^2$  is likely to be higher under the IFRS regime as compared to local GAAPs. If countries move closer to the incurred loss approach of IAS 39, then our basic regression model (1a) should better explain the variation in loan loss provisions across banks after IFRS adoption. Second and more importantly, the additional explanatory power of country dummies in model (1b) should be higher under local GAAP than under IFRS. Specifically, we test whether  $(R_{1b}^2 - R_{1a}^2)^{\text{Pre-IFRS}}$  is significantly greater than  $(R_{1b}^2 - R_{1a}^2)^{\text{Post-IFRS}}$ . For this test we estimate equations (1a) and (1b) 1000 times, randomly assigning banks to the relevant partitions (i.e., pre- and post-IFRS adoption) and base our significance test on the standard error of the empirical distribution of the difference  $(R_{1b}^2 - R_{1a}^2)^{\text{Post-IFRS}} - (R_{1b}^2 - R_{1a}^2)^{\text{Pre-IFRS}}$  (see for a similar approach Barth et al. 2012).

{Insert Table 4 here}

Table 4 reports the results for regressions (1a) and (1b) and an additional specification that includes future charge-offs. For both specifications, we find a significant reduction in the incremental explanatory power of country dummies by 12 percent, respectively, suggesting substantial improvement in the cross-country comparability of loan loss allowances. Even without the inclusion of country fixed effects, the explanatory power of both base specifications is very high, especially in the post-IFRS adoption period, (i.e., 76 percent in column (3) and 85 in column (7)).

Figure 2 shows the time series evolution of the explanatory power as measured by  $R^2$  of the regressions (1a), (1b) and the incremental  $R^2$  of country dummies (i.e., the difference between the  $R^2$ s of (1a) and (1b)) from yearly regressions throughout our sample period. We observe a significant increase in the  $R^2$  of the base model particularly in 2005, i.e., in the year of IFRS adoption. Furthermore, the incremental  $R^2$  of the country dummies significantly drops starting from the year 2004 and reaching the lowest value of five percent in the year 2006. Overall, our results suggest that the loan loss allowances experienced a structural shift around the mandatory adoption of IFRS leading to more comparable loan loss accounting across EU countries.

{Insert Fig. 2 here}

## ***5.2. The role of supervisory intervention***

In this section, we investigate whether and how supervisory agencies and their actions upon IFRS adoption affect the comparability of loan loss provisioning practices. This analysis serves two purposes. First, we are interested in how comparability effects of IFRS adoption interact with regulatory actions by supervisors (see Brüggemann et al. 2013). Specifically, we examine whether supervisors' attitude towards the IFRS' incurred loss approach supports or hinders comparability. Second, to the extent that comparability effects predictably vary with

cross-sectional differences in regulatory actions, this mitigates concerns that our primary findings are attributable to other unobserved trends.

Again, we start by examining the distributional characteristics of coverage ratios. Table 5 Panel A ranks countries by the magnitude of the change in pairwise differences in median country-level coverage ratios (starting with the largest decrease on the top of the table). Panel A reveals that eleven of twelve countries experienced a decrease in pairwise differences in coverage ratios, indicating greater comparability. Interestingly, Danish banks exhibited the largest difference in coverage ratios relative to other countries before IFRS adoption, but also experienced the largest decrease in pairwise differences upon the switch. This finding is consistent with the Danish supervisors accepting and enforcing the switch from “mark-to-market” accounting to the incurred loss approach. Generally, Panel A shows that countries with larger pre-IFRS differences experienced the largest decrease in pairwise differences in coverage ratios except for two notable exceptions, Portugal and Spain. Consistent with the reluctance of the Portuguese and Spanish supervisors to enforce the incurred loss approach, these countries exhibit similar pairwise differences in country-level coverage ratios in both the pre- and post-IFRS periods. Panel B of Table 5 shows that the decrease in pairwise differences in coverage ratios in Denmark – labelled as *MVA* - (Portugal and Spain, labelled as *Statistical*) is statistically significantly larger (smaller) than in non-interventionist countries. These findings support the argument that (non-)acceptance of the incurred loss approach by bank supervisors matters for its consistent implementation.

{Insert Table 5 here}

Next, to investigate the impact of supervisors on loan loss allowances further, we modify the analyses reported in columns (5) to (8) of Table 4 (which include future charge-offs) by replacing the country dummies in the non-nested models (columns (6) and (8)) with indicator

variables capturing the different provisioning regimes discussed in Section 2.1.2.<sup>15</sup> Specifically, *Statistical* is an indicator variable taking the value of one for banks from Portugal and Spain, where statistical or dynamic provisioning was in place, and zero otherwise. *MVA* takes the value of one for banks from Denmark that had to apply “market value” accounting before the adoption of IFRS, and zero otherwise. In this specification, *Statistical* and *MVA* capture the level of provisioning beyond the provisioning of banks in countries with no supervisory intervention in accounting standard setting (i.e., non-interventionist regimes).

Based on our *de jure* analysis we expect to observe positive coefficients on *Statistical* and *MVA* before the adoption of IFRS. If IFRS leads to more comparable loan loss allowances, we expect all firms to reduce the level of overprovisioning after IFRS adoption. However, this reduction should be more pronounced in the *Statistical* and *MVA* provisioning regimes.

{Insert Table 6 here }

Table 6 reports results consistent with banks from *Statistical* and *MVA* countries maintaining higher allowances beyond incurred losses than banks from non-interventionist countries both in the period before and after mandatory IFRS adoption (columns (2) and (4) of Table 6). In line with market value accounting incorporating expected losses more comprehensively before the adoption of IFRS, loan loss allowances were highest for *MVA* banks (column (2)). Column (5) tests for difference-in-differences for *Statistical* and *MVA*, i.e., the incremental change in provisioning in these regimes relative to the base group. Both *MVA* and *Statistical* banks decreased the loan loss allowance more than banks in non-interventionist countries. *MVA* banks experienced the largest reduction in over-reserving as indicated by the tests in columns (5) and (6).

---

<sup>15</sup> We obtain similar results when we use the specification without future charge-offs (i.e., columns (1) to (4) from Table 4) or other specifications (e.g., including the average of current and past charge-offs).

Taken together, the findings in Table 6 corroborate the convergence of different loan loss accounting regimes following the adoption of IFRS. However, the coefficients on *Statistical* and *MVA* in column (4) indicate that supervisory intervention still matters. In particular, the level of over-reserving in *Statistical* regimes remains significant relative to non-interventionist countries, consistent with banks being reluctant to release their loan loss buffers possibly due to the pressure from their supervisors. This latter finding suggests that intervention by supervisors can hinder compliance with accounting standards.

### **5.3. Additional cross-sectional analyses – Exploiting transition effects**

So far our cross-sectional analyses have relied on an *ex ante* classification of countries into more or less forward looking provisioning regimes based on the extent of supervisory intervention. However, it is possible that even in non-interventionist countries banks used the discretion afforded to them to apply forward-looking provisioning or to build up reserves. Therefore, in this section, we use *bank-specific* IFRS transition effects on the loan loss allowance as an *ex post* measure of revealed differences between banks' prior provisioning practices and the incurred loss approach. Specifically, we exploit the fact that in their first IFRS statement banks had to restate their prior-year results according to IFRS; that is, for the year prior to IFRS adoption we can compare loan loss allowance numbers prepared under local GAAP with those reported under IFRS. Since the accounting numbers are for the *same firm year*, the differences between IFRS and local GAAP loan loss allowance figures will capture the extent of banks' prior over- or under-provisioning relative to the incurred loss approach.

Table 7 provides descriptive statistics on the differences between loan loss allowances reported under the IFRS and those reported under local GAAP by country. Three major country clusters emerge from the observed transition effects. In one group of countries, banks experienced a significant decrease in loan loss allowances reflecting previous over-reserving (e.g., Denmark, Ireland, Italy and Finland). The result for Denmark is consistent with the

reversal of the excess reserves that Danish banks built up due to the previous application of “mark-to-market” accounting. It further provides support for the argument that the Danish supervisor has accepted the primacy of IFRS to regulate bank accounting. Another group of countries show only small changes in their loan loss allowances (e.g., Netherlands, United Kingdom<sup>16</sup>, Sweden). Local GAAP provisioning rules in these countries were close to those in IAS 39. However, the direction of the impact of IFRS varies widely; for example, in the United Kingdom 40 percent of the banks experience an increase and 60 percent a decrease in their loan loss allowances. Finally, the third cluster of countries consisting of Belgium, France and Greece that experienced a significant increase in loan loss allowances. The increase in loan loss allowances is primarily attributable to the use of undiscounted expected cash flows to measure the amount of impairments in these countries, while IFRS requires discounted cash flows.

Interestingly, Portugal and Spain show relatively small transition effects. Given that the underlying local GAAP regimes required forward-looking provisioning, we expected significant reversals of their loan loss allowances upon transition to IFRS. Yet, only 50 percent and 25 percent of Spanish and Portuguese banks, respectively, exhibit (minor) decreases in their loan loss allowance. This finding is consistent with the argument that supervisors in these countries were reluctant to accept the incurred loss approach and instead required banks to maintain prudent provisioning practices even under IFRS.

{Insert Table 7 here}

Next, we use the observed transition effects as a proxy for the (dis)similarity of banks’ prior provisioning practices and IFRS’ incurred loss approach and explore whether they are associated with the magnitude of the IFRS impact on comparability. Specifically, we expect

---

<sup>16</sup> In the United Kingdom the large mean increase in the loan loss allowance is driven by one bank, the London Scottish Bank.

that the comparability effects of IFRS adoption reported in Table 4 will be larger for banks whose loan loss accounting practices were further away from the incurred loss approach. To test this prediction, we split our sample based on the observed transition effects and assign banks with an absolute change in their loan loss allowance of more (less) than six percent to the *Large transition effects* (*Small transition effects*) partition.<sup>17</sup> Then, we replicate our analysis from Table 4 using the specification that includes *F\_GCO* for the two subsamples separately.

Table 7 Panel B shows that the incremental explanatory power of country dummies reduces significantly by 15 percent for *Large transition effects*, but remains virtually unchanged for *Small transition effects* banks, respectively. The large(r) improvement in the comparability of loan loss allowances in the *Large transition effects* subsample is consistent with our prediction and mitigates concerns that our primary findings in Table 4 are driven by omitted factors or a general time trend.<sup>18</sup> Furthermore, the smaller incremental  $R^2$ s of country dummies in the *Small transition effects* subsample in the pre-IFRS period (9 percent) is in line with the argument that provisioning practices of these banks were already similar to the IAS 39 incurred loss approach even before the accounting switch. Overall, the results reported in this section support our previous inferences that IFRS adoption has led to a convergence of loan loss accounting practices.

---

<sup>17</sup> We chose the six percent cut-off point based on two considerations. First, the transition effects in the *Small\_transition\_effect* group should be indeed relatively small. Second, both subsamples should include sufficient number of observations. Using other cut-offs points (e.g., the median transition effect) yields similar results.

<sup>18</sup> We acknowledge that transition effects on loan loss allowances likely depend also on the underlying business model or the types of loans banks hold on their balance sheets. While we do not have data on banks' loan compositions, the relative proportion of different bank specializations is comparable for the small versus large transition effects subsamples. Specifically, the proportion of commercial, bank holding, cooperative, savings and real estate banks is 68%, 24%, 5%, 3%, and 0% for *Small Transition Effects* banks and 62%, 19%, 14%, 3%, and 2% for *Large Transition Effects*, respectively. A major identification threat would come from a convergence of business models of *Large Transition Effects* after IFRS adoption, which is unlikely to be the case.

#### 5.4. Predictive ability of loan loss allowances

The analyses in the previous sections suggest that loan loss accounting has become more comparable across countries after the adoption of IFRS. However, they also show that the level of loan loss allowances decreased significantly. This raises the concern that by reducing discretion the incurred loss approach also limits managements' ability to incorporate information about future expected losses, which might result in lower loan loss allowance informativeness. We address this question in the following analysis.

To test the impact of IFRS adoption on the predictive ability of loan loss allowances we estimate the following regressions separately for the local GAAP and IFRS period (similar to Beck and Narayanamoorthy 2013):

$$GCO_{it+1j} / GCO_{it+2j} = \beta_0 + \beta_1 LLA_{itj} + \beta_2 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \beta_6 \Delta Unemployment_{itj} + \\ Bank\ specialization\ dummies + \varepsilon_{it} \quad (2a)$$

$$GCO_{it+1j} / GCO_{it+2j} = \beta_0 + \beta_1 LLA_{itj} + \beta_2 LLA_{itj} * Statistical + \beta_3 LLA_{itj} * MVA + \beta_4 \\ Statistical + \beta_5 MVA + \beta_2 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \\ \beta_6 \Delta Unemployment_{itj} + Bank\ specialization\ dummies + \varepsilon_{it} \quad (2b)$$

where  $GCO_{it+1j}$  ( $GCO_{it+2j}$ ) is one-year-ahead (two-year-ahead) gross charge-offs. We do not include the independent credit risk variables ( $NPL_{itj}$  and  $Loans_{itj}$ ) in the above models to facilitate the evaluation of the ability of loan loss allowances to explain future charge-offs on a stand-alone basis (see also Beck and Narayanamoorthy 2013). In model (2b) we include interactions of  $LLA$  with  $MVA$  and  $Statistical$  to test whether the predictive ability of loan loss allowances is higher under regimes that were in principle more forward-looking.  $\beta_1$  in model (2b) captures the predictive ability of loan loss allowances in *non-interventionist* countries. We cluster standard errors at the bank level.

Table 8 Panel A (Panel B) presents the results for the predictive ability of loan loss allowances for one-year-ahead (two-year-ahead) charge-offs in the pre- and post-IFRS period separately. As expected, Panel A (Panel B) column (1) shows that the association between loan loss allowances (*LLA*) and one-year-ahead (two-year-ahead) charge-offs is positive and statistically significant for the pooled EU sample in the pre-IFRS period. Column (2) further reveals that, before IFRS adoption, loan loss allowances in *Statistical* regimes (i.e., Portugal and Spain) have a higher association with future charge-offs ( $GCO_{t+1}$  and  $GCO_{t+2}$ ) than in non-interventionist countries. Specifically, the coefficients on the interaction term *LLA\_Statistical* are positive (0.212 in Panel A; 0.235 in Panel B) and statistically significant (at less than the one percent level). In fact, the magnitude of the association between loan loss allowances with one-year-ahead (two-year-ahead) gross charge-offs is two-and-a-half (three) times larger in *Statistical* countries than in non-interventionist countries. This evidence suggests that statistical and dynamic provisioning can improve the predictive ability of loan loss allowances, probably because rules-based approaches offer less room for discretion and are easier to enforce than principles-based approaches.

Interestingly, the principles-based market value accounting in Denmark does not result in a higher association of loan loss allowances with future charge-offs in the pre-IFRS period (negative and close-to-zero coefficients on *MVA\_LLA* column (2) in Panel A and Panel B). This finding is surprising and contrasts with what one would expect, since, in theory, market value accounting is by definition more forward looking than other loan loss accounting approaches. However, in Denmark market values of loans were not based on observable market prices but estimated by management, and thus, were subject to significant discretion. Our results do not suggest that this discretion was used to incorporate information about future expected losses. Accordingly, Danmarks Nationalbank acknowledges that “[u]nder the previous accounting rules based on the prudential principle the banking institutions’ loan loss

provisions were not necessarily reflected in losses whereby the accumulated provisions partly served as buffer” (Danmarks Nationalbank 2006, p. 27).

{Insert Table 8 here}

Finally and importantly, in both Panel A and Panel B of Table 8, the comparison of columns (1) and (2) with columns (3) and (4), respectively, suggests that the association of loan loss allowances with future charge-offs has increased, on average, after the adoption of IFRS (significant at the 1% level). For example, in Panel A the coefficient on *LLA* increases from 0.136 in the pre-IFRS period (column (2)) to 0.232 in the post-IFRS period (column (4)). Moreover, the coefficients on the interaction terms *LLA\_Statistical* and *LLA\_MVA* are not significant any more in column (4) of Panel A and Panel B, suggesting that IFRS adoption largely reduces cross-country differences in the predictive ability of loan loss allowances.

Taken together, our results show that the predictive ability of loan loss allowances has increased under IFRS relative to the predictive ability of loan loss allowances under the (partial) expected loss approaches as implemented under different local GAAPs. We should note, however, that our test captures only predictive ability for the near term of one to two years. For this short horizon one should actually expect a higher association of loan loss allowances with charge-offs as allowances for incurred losses reflect future loan losses that are expected to occur with a rather high probability. The challenge for a more comprehensive loan loss provisioning as attempted with variants of expected loss provisioning models (e.g., the IFRS 9 impairment model) is to capture future loan losses also for longer horizons. Therefore, we caution the reader not to interpret our findings in a way that the incurred loss approach is preferable to the more forward-looking expected loss approaches.

## **6. Does greater loan loss allowance comparability improve supervisory effectiveness?**

So far, our results indicate that the comparability and predictive ability of loan loss allowances increased after IFRS adoption, but they do not speak to potential benefits of increased comparability. One of the main expected benefits of financial statement comparability from a supervisory perspective is that it could support the effective supervision of banks. Specifically, as mentioned earlier, increased comparability enhances the level playing field between banking institutions and strengthens market discipline, which is one of the main pillars of international bank regulation and supervision (ECB 2006; BCBS 2006).<sup>19</sup> More comparable financial statement information improves the ability of market participants to assess the riskiness of banks and helps them to impose disciplinary pressures on banks' risk taking. In this section, we attempt to test whether more comparable loan loss accounting under IFRS is associated with a reduction in cross-country differences in the strength of market discipline over banks' risk taking.

To do so, we build on Bushman and Williams (2012) who document that cross-country variation in loan loss provisioning practices is associated with variations in the strength of market discipline over risk taking. Discretionary loan loss provisioning designed to smooth earnings dampens risk-taking discipline, while loan loss provisioning reflecting timely expected loss recognition enhances risk-taking discipline. Based on these findings, we expect that increased comparability of loan loss accounting is associated with less variation in the strength of market discipline over risk taking across EU countries.

To test this conjecture we proceed in two steps. First, we examine pre- and post-IFRS variation in the strength of country-level market discipline over risk taking and the change in

---

<sup>19</sup> Market discipline as a supervisory tool was first formally introduced by the Basel II international capital regulatory framework in 2006 (BCBS 2006) and implemented by most advanced economies around the world (World Bank 2012). Basel II rests on three pillars: Pillar 1, minimum capital requirements, Pillar 2, supervisory review process, and Pillar 3, market discipline. Pillar 3 requires a range of capital and risk related disclosures that have been continuously expanded in recent years (see BCBS 2017 for the most recent Pillar 3 disclosure regulation).

the variation around the accounting regime switch. Second, we examine the association of cross-country variation in the strength of market discipline with pre-IFRS differences in loan loss accounting. We expect this association to be stronger (weaker) before (after) the adoption of IFRS.<sup>20</sup>

To measure the strength of market discipline over risk taking we follow prior literature in finance and accounting (e.g., Hovakamian and Kane 2000; Flannery and Rangan 2008; Bushman and Williams 2012) and examine the sensitivity of changes in bank leverage to changes in asset risk. This measure is based on the central idea of bank regulation that bank leverage (capital) should decrease (increase) with increases in asset risk. Specifically, we estimate the following OLS regression for each country separately for the pre- and post-IFRS adoption period:

$$\Delta D/V_{it} = \alpha_0 + \alpha_1 * \Delta \sigma_{V_{it}} + \varepsilon_{it} \quad (3)$$

where  $D$  is the face value of debt,  $V$  is the market value of bank assets,  $\Delta \sigma_V$  is the change in the volatility of the market value of bank assets. To estimate  $V$  and  $\sigma_V$  we exploit the concept that a firm's equity can be represented as a call option on the firm's assets, where the strike price is the face value of debt. Using the face value of reported liabilities ( $D$ ), the observed market value of equity, and the estimated standard deviation of stock returns, we obtain values for  $V$  and  $\sigma_V$  (see Appendix C for details).

We retain the country-specific coefficients on  $\sigma_V$ ,  $\alpha_1$  in equation (3), capturing the country-specific sensitivities of leverage to changes in asset risk. Effective market discipline should yield a negative  $\alpha_1$  coefficient consistent with the idea that for every unit increase in asset risk banks should decrease leverage. Table 9 Panel A reports the country-specific sensitivities of

---

<sup>20</sup> We acknowledge that (the change in) market discipline is influenced by many factors (e.g., bank and country-level governance; EU wide implementation of Basel II; increased risk disclosures in IFRS and Pillar 3 reports). Furthermore, it is not our objective to determine the level of risk-taking. Instead, we explore cross-country variation in the sensitivity of bank leverage to changes in risk and how this variation is associated with country-level differences in loan loss accounting before and after the adoption of IFRS.

changes in leverage to changes in asset risk for the pre- and post-IFRS periods separately. The sample size is somewhat reduced due to missing market data for some banks (e.g., Finland is not included). Before IFRS adoption, Panel A shows substantial cross-country variation in the sensitivity of leverage to risk. In fact, three of the eleven countries exhibit positive  $\alpha_1$  coefficients inconsistent with effective market discipline. However, after the adoption of IFRS all country-level risk sensitivities are negative and more comparable in terms of magnitudes. The lower part of Panel A (and Panel B) indicates that the range, interquartile range and standard errors of (pairwise differences in) country-level sensitivities decrease in the post-IFRS period. These findings suggest that the risk sensitivity of leverage has become more comparable following the adoption of IFRS across EU countries.

{Insert Table 9 here}

Next, we investigate whether the cross-country convergence in risk sensitivities of leverage is associated with the country-level differences in loan loss accounting as measured by the median country-level IFRS transition effects on the loan loss allowance. Panel C of Table 9 reports the pairwise differences in country-level risk sensitivities for each country before and after IFRS adoption, the change in the pairwise differences between the two periods and in the last column the median country-level transition effects on the loan loss allowance (*TransEff\_LLA*) obtained from Table 7 Panel A.<sup>21</sup> The fourth column (*'Change'*) shows the signed changes of each country's risk sensitivity relative to the other ten countries from the pre- to post-IFRS period. Negative signs indicate improvements in risk sensitivities relative to other countries. The fifth column (*'Change in absolute pw. diff.'*) shows that the absolute magnitude in pairwise differences decreased in all countries except in Ireland. Panel D of Table

---

<sup>21</sup> Specifically, for each country and country-pair we calculate the differences in the  $\alpha_1$  coefficient from the country-level estimation of equation (3), and report the mean pairwise differences in  $\alpha_1$  pre- and post-IFRS adoption.

9 reports results from simple OLS regressions of pre- and post-IFRS pairwise differences in risk sensitivities and their changes between the two periods on the median country-specific transition effects on loan loss allowances (*TransEff\_LLA*). The results show that while pre-IFRS pairwise differences in risk sensitivities are significantly associated with *TransEff\_LLA*, this association is statistically insignificant after IFRS adoption. Moreover, the change in absolute magnitudes of pairwise differences from the pre- to post-IFRS periods are significantly negatively associated with *TransEff\_LLA*. The latter result suggests that the reduction in country-level pairwise differences is larger in countries that had to increase their loan loss allowances upon transition to IFRS (positive *TransEff\_LLA*). More importantly, these findings indicate that the cross-country convergence in risk sensitivities of leverage is associated with the improvement in comparability of loan loss allowances. Taken together, these findings indicate that the improvement of cross-country comparability of loan loss allowances are associated with an improvement in market discipline, which, in turn, might support effective bank supervision.

## **7. Conclusion**

We investigate the impact of mandatory IFRS adoption on the comparability of loan loss accounting of banks in 12 European countries. We find that loan loss accounting has become more comparable across countries after the accounting regime switch. Some differences remain in countries where supervisors have been historically involved in accounting standard setting and reluctant to enforce the incurred loss approach. Our study also provides evidence that the association of loan loss allowances with future charge-offs has improved following IFRS adoption. Moreover, we provide first evidence on the benefits of increased comparability of loan loss allowances on market discipline. Specifically, we find that increased loan loss

allowance comparability is associated with a convergence in our proxy for the strength of market discipline within the EU.

We do not claim that the incurred loss approach is preferable to (properly implemented) expected loss approaches. Nevertheless, we believe our findings have important implications for the recent changes in loan loss accounting that will require a broader recognition of future expected losses (e.g., the adoption of IFRS 9 in the EU from 1 January 2018). First, the discretion in loan loss accounting provided under previous local GAAP rules does not appear to have been used to incorporate future expected losses, unless there is a strong supervisor that enforces very detailed formula-based rules as in the case of Portugal and Spain. Second, while in theory the incurred loss approach has conceptual deficiencies, in practice it seems to fare better than the previous forward-looking approaches. Specifically, it increases comparability of loan loss accounting across countries and improves the (short-term) predictive ability of the reported loan loss allowances for future charge-offs. Taken together, our results raise concerns over the impact of IFRS 9 on the comparability and the informativeness of loan loss accounting. The more discretionary expected loss approach under IFRS 9 potentially yields less comparable loan loss allowances. Moreover, it is unclear whether managers will exploit the greater discretion opportunistically or to inform about future expected losses (Bushman and Williams 2012).

Finally, while we are not able to identify causality, we believe our market discipline analyses highlight one potential channel through which financial statement comparability can enhance the effectiveness of bank supervision. As such, our findings are relevant not only to accounting standard setters but also bank regulators and supervisors .

## References

- Altamuro, J., and Beatty, A., 2010. How does internal control regulation affect financial reporting? *Journal of Accounting and Economics*, 49(1), 58-74.
- Ball, R., 2006. International Financial Reporting Standards (IFRS): pros and cons for investors. *Accounting and Business Research* 36(sup 1), 5-27.
- Balla, E., Rose, M., and Romero, J., 2012. Loan Loss Reserve Accounting and Bank Behavior. Federal Reserve Bank of Richmond Economic Brief 12-03: 1-4.
- Banco de Portugal, 2004. Financial Stability Report 2004. Lissabon.
- Banco de Portugal, 2005. Financial Stability Report 2005. Lissabon.
- Barth, J. R., G. Caprio and R. Levine (2001). The Regulation and Supervision of Banks around the World: A new database. World Bank Working Paper No. 2588 (Washington, DC).
- Barth, M. E., Landsman, W. R., Lang, M., and Williams, C., 2012. Are IFRS-based and US GAAP-based accounting amounts comparable? *Journal of Accounting and Economics*, 54(1), 68-93.
- Basel Committee on Banking Supervision (BCBS), 2006. International Convergence of Capital Measurement and Capital Standards: A Revised Framework— Comprehensive Version. Bank for International Settlements.
- Basel Committee on Banking Supervision (BCBS), 2015. Guidance on credit risk and accounting for expected credit losses. December 2015.
- Basel Committee on Banking Supervision (BCBS), 2017. Pillar 3 disclosure requirements – consolidated and enhanced framework. March 2017.
- Beatty, A., and Liao, S., 2011. Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics*, 52(1), 1-20.
- Beatty, A., and Liao, S., 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics*, 58(2), 339-383.
- Beaver, W. H., and Engel, E. E., 1996. Discretionary behavior with respect to allowances for loan losses and the behavior of security prices. *Journal of Accounting and Economics*, 22(1), 177-206.
- Beck, P. J., and Narayanamoorthy, G. S., 2013. Did the SEC impact banks' loan loss reserve policies and their informativeness? *Journal of Accounting and Economics*, 56(2), 42-65.
- Benston, G., and Wall, L. D., 2005. How should banks account for loan losses? *Journal of Accounting and Public Policy*, 24(2), 81-100.
- Bernard, V. L., Merton, R. C., and Palepu, K. G., 1995. Mark-to-market accounting for banks and thrifts: Lessons from the Danish experience. *Journal of Accounting Research*, 1-32.
- Bischof, J., Daske, H., Elfers, F., and Hail, L., 2016. A tale of two regulators: Risk disclosures, liquidity, and enforcement in the banking sector. Working Paper, University of Mannheim.
- Brüggemann, U., Hitz, J.-M., and Sellhorn, T., 2013. Intended and unintended consequences of mandatory IFRS adoption: A review of extant evidence and suggestions for future research. *European Accounting Review*, 22(1), 1-37.
- Bushman, W., 2016. Transparency, Accounting Discretion and Bank Stability, Federal Reserve Bank of New York's Economic Policy Review, Issue August 2016, 129-149, 2016

- Bushman, R., and Landsman, W. R., 2010. The pros and cons of regulating corporate reporting: A critical review of the arguments. *Accounting and Business Research*, 40(3), 259-273.
- Bushman, R. M., ND Williams, C. D., 2012. Accounting discretion, loan loss provisioning, and discipline of banks' risk-taking. *Journal of Accounting and Economics*, 54(1), 1-18.
- Cascino, S., and Gassen, J., 2015. What Drives the Comparability Effect of Mandatory IFRS Adoption? *Review of Accounting Studies*, 20(1), 242-282.
- Christensen, H. B., Hail, L., and Leuz, C., 2013. Mandatory IFRS reporting and changes in enforcement. *Journal of Accounting and Economics*, 56(2), 147-177.
- Costello, A., Granja, J., and Weber, J., 2016. Do Strict Regulators Increase the Transparency of the Banking System? Working paper, University of Michigan, University of Chicago, Massachusetts Institute of Technology.
- Danmarks Nationalbank, 2006, Financial Stability, <[http://www.nationalbanken.dk/en/publications/Documents/2006/06/fin\\_stab\\_06\\_uk\\_web.pdf](http://www.nationalbanken.dk/en/publications/Documents/2006/06/fin_stab_06_uk_web.pdf)>
- Danmarks Nationalbank, 2007, Financial Stability, <[https://www.nationalbanken.dk/C1256BE9004F6416/side/Financial\\_Stability\\_2007\\_web/\\$file/finstab2007\\_UK\\_web.pdf](https://www.nationalbanken.dk/C1256BE9004F6416/side/Financial_Stability_2007_web/$file/finstab2007_UK_web.pdf)>
- DeFond, M., Hu, X., Hung, M., and Li, S., 2011. The impact of IFRS adoption on foreign mutual fund ownership: the role of comparability, *Journal of Accounting and Economics*, 51(3), pp. 240–258.
- De Franco, G., Kothari, S., and Verdi, R. S., 2011. The benefits of financial statement comparability. *Journal of Accounting Research*, 49(4), 895-931.
- Dugan, J., 2009. Loan Loss Provisioning and Pro-cyclicality. Remarks by John C. Dugan, Comptroller of the Currency before the Institute of International Bankers, March 2, 2009. <https://www.occ.treas.gov/news-issuances/speeches/2009/pub-speech-2009-16.pdf>.
- European Banking Authority (EBA), 2017. Guidelines on credit institutions' credit risk management practices and accounting for expected losses. 12 May 2017.
- European Central Bank (ECB), 2006. Assessment of accounting standards from a financial stability perspective. December 2006.
- European Central Bank (ECB), 2014. Why accounting matters - A central bank perspective. Occasional Paper Series No. 153, May 2014.
- Fernandez de Lis, S., Martinez Pages, J. and Saurina, J., 2001. Credit Growth, Problem Loans and Credit Risk Provisioning in Spain', in Bank for International Settlements, *Marrying the Macro- and Micro-aspects of Financial Stability*, BIS Papers No. 1, 331–353.
- Fernández de Lis, S., and Garcia Herrero, A., 2010. Dynamic provisioning: Some lessons from existing experiences: ADBI working paper series.
- Financial Services Authority (FSA), 2004. *Implications of a changing accounting framework*. Consultation Paper 04/17, London.
- Flannery, M.J. and Rangan, K.P., 2008. What caused the bank capital build-up of the 1990s?. *Review of Finance*, 12(2), 391-429.
- Gaston, E. and Song, M.I., 2014. Supervisory roles in loan loss provisioning in countries implementing IFRS (No. 14-170). International Monetary Fund.

- Gebhardt, G., and Novotny-Farkas, Z., 2011. Mandatory IFRS adoption and accounting quality of European banks. *Journal of Business Finance & Accounting*, 38(3-4), 289-333.
- Hovakimian, A., and Kane, E., 2000. Effectiveness of capital regulation at U.S. Commercial Banks, 1985 to 1994. *Journal of Finance* 55, 451–469.
- International Accounting Standards Board (IASB), 2009. Transcript of the IASCF Trustees and Monitoring Board Meeting, 15.45 – 17.30, 1 April 2009.
- International Accounting Standards Board (IASB), 2010. The conceptual framework for financial reporting, as in September 2010. International Accounting Standards Board, London, UK.
- International Monetary Fund (IMF), 2003. United Kingdom: Financial System Stability Assessment including Reports on the Observance of Standards and Codes on the following topics: Banking Supervision, Insurance Supervision, Securities Regulation, Payment Systems, Monetary and Financial Policy Transparency, Securities Settlement Systems, and Anti-Money Laundering and Countering Terrorist Financing. Country Report No. 03/46 (Washington, DC), file://lanes/homes/22/novotnyf/Downloads/\_cr0346.pdf,
- International Monetary Fund (IMF), 2007. Denmark: Financial Sector Assessment Program - Detailed Assessment of Observance of the Basel Core Principles. Country Report No. 07/118 (Washington, DC), <http://www.imf.org/external/pubs/ft/scr/2007/cr07118.pdf>.
- Mann, F., and Michael, I., 2002. Dynamic provisioning: issues and application. *Financial Stability Review*, 13, 128-136.
- Nicoletti, A., 2017. The effects of bank regulators and external auditors on loan loss provisions. Working Paper, The Wharton School.
- Nouy, D., 2014. Regulatory and financial reporting essential for effective banking supervision and financial stability. Dinner Speech at the Fourth ECB conference on accounting, financial reporting and corporate governance for central banks, <https://www.bankingsupervision.europa.eu/press/speeches/date/2014/html/se140603.en.html>.
- Ozkan, N., Singer, Z., and You, H., 2012. Mandatory IFRS adoption and the contractual usefulness of accounting information in executive compensation. *Journal of Accounting Research*, 50(4), 1077–1107.
- Plumlee, M., Shakespeare, C., and Yohn, T. L., 2017. The impact of IFRS 13 on the comparability of fair values in financial reporting. Unpublished Working Paper.
- Ronn, E.I., and Verma, A.K., 1986. Pricing risk-adjusted deposit insurance: An option-based model. *The Journal of Finance*, 41(4), 871-895.
- Ryan, S. G., 2007. *Financial instruments and institutions: Accounting and disclosure rules*. John Wiley & Sons, 2007.
- Singleton-Green, B., 2015. The Effects of Mandatory IFRS Adoption in the EU: A Review of Empirical Research. *Information for Better Markets*.
- Yip, R.W., and Young, D., 2012. Does mandatory IFRS adoption improve information comparability? *The Accounting Review*, 87(5), 1767-1789.
- Young, S., and Zeng, Y., 2015. Accounting comparability and the accuracy of peer-based valuation models. *The Accounting Review*, 90(6), 2571-2601.

- Yu, G., 2010. Accounting standards and international portfolio holdings: analysis of cross-border holdings following mandatory adoption of IFRS, Ph.D. dissertation, University of Michigan at Ann Arbor.
- Wall, L. D., and Koch, T. W., 2000. Bank loan loss accounting: A review of theoretical and empirical evidence. Federal Reserve Bank of Atlanta, Economic Review, 85(2), 1-19.
- World Bank, 2012. Bank regulation and supervision around the world - A crisis update. Policy Research Working Paper 6286.
- Wu, J. S., and Zhang, I. X., 2010. Accounting Integration and Comparability: Evidence from Relative Performance Evaluation around IFRS Adoption, Working paper, University of Rochester and University of Minnesota.

## Appendix A. Supervisory powers and rules related to loan loss accounting

Supervisory powers with regard to intervention in accounting regulation		Loan loss provisioning and supervision							
Country	Supervisory authority	Does the supervisory authority have the right and power to issue accounting standards?	Does the supervisory agency have the right to meet with external auditors to discuss their report without the approval of the bank?	Can supervisors take legal action against external auditors for negligence?	Do specific regulatory guidelines exist on loan classification? <sup>4</sup>	Do specific guidelines on loan loss provisioning exist (formulas, provisioning matrix)? <sup>5</sup>	Does the supervisor have the power to raise the level of provisions? <sup>4</sup>	Are general loan loss provisions part of Tier 2 capital? <sup>4</sup>	Are IFRS impairment provisions accepted without adjustments for regulatory purposes?
Belgium	Banking, Finance and Insurance Commission	No	Yes	Yes	Yes	No	Yes	No	Yes
Denmark	Danish Financial Supervisory Authority (Finanstilsynet)	Yes <sup>1</sup>	Yes	Yes	No	No	Yes	No	Yes
Finland	Financial Supervisory Authority	No	Yes	No	No	No	No	No	Yes
France	Commission Bancaire	No	Yes	No	Yes	No	Yes	Yes	Yes
Greece	Bank of Greece	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Ireland	Irish Financial Regulator	No <sup>2</sup>	Yes	Yes	No	No	Yes	Yes	Yes
Italy	Banca d'Italia	No	Yes	No	Yes	No	No	No	Yes
Netherlands	De Nederlandsche Bank	No	Yes	Yes	No	No	Yes	No	Yes
Portugal	Banco de Portugal	Yes	Yes	Yes	Yes	Yes	Yes	Yes <sup>6</sup>	No
Spain	Banco de España	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Sweden	Swedish Financial Supervisory Authority (Finansinspektionen)	No	No	No	No	No	No	No	Yes
UK	Financial Services Authority	No <sup>3</sup>	Yes	No	No	No	Yes	Yes	Yes

<sup>1</sup> According to section 196 of the *Financial Business Act* the *Danish Financial Supervisory Authority* (DFSA) has the authority to issue more detailed guidelines on accounting issues. <sup>2</sup> The *Irish Financial Regulator* issues guidelines on accounting issues. <sup>3</sup> The *British Bankers' Association* issues Standards of Recommended Practice (SORP). <sup>4</sup> This information is based on the World Bank Database 2007 on Bank Regulation and Supervision. For a detailed description of the database see Barth et al. (2001). <sup>5</sup> Information

is based on the International Monetary Fund's Coordinated Compilation Exercise (CEE) for Financial Soundness Indicators (<http://fsi.imf.org/cce>).<sup>6</sup> Since the introduction of IFRS.

## Appendix B. Detailed de jure analysis of loan loss provisioning regulations

### *Spain*

In Spain the *Banco de España* has the authority to set accounting rules for financial institutions. Spain was the first country to introduce a so called dynamic provisioning approach in 2000.<sup>22</sup> Under this approach in addition to specific and general provisions banks also had to recognize statistical provisions which were meant to cover expected credit losses. The rationale behind this method is to recognise expected losses reflected in the risk premia on loans as an accounting expense that is matched with the recognition of interest income in profit and loss. In a sense the statistical provision is a reserve built up during good times (i.e. high credit growth) that can be depleted during bad times. It is “dynamic” because it increases when expected credit losses exceed realized losses and decreases when it is used to offset specific provisions in times of higher than expected realized losses.<sup>23</sup> Banks may use their own internal models in order to determine the statistical provision: Alternatively, they may choose the standard approach where the parameters are provided by the *Banco de España*.<sup>24</sup> Banks have to disclose separately the level and movements of each type of provision (specific, general and statistical) and the methods used to determine the provisions.<sup>25</sup>

Upon the transition to IFRS the rules had to be changed because such statistical provisions are incompatible with the incurred loss approach of IAS 39. Therefore, the *Banco de España* issued Circular No. 4/2004 on *Public and Confidential Reporting Rules and Formats for Credit Institutions*. The objective of this Circular was to adapt the Spanish accounting rules for banks to IFRS. While Rule 29 of Circular No. 4/2004 largely resembles the respective impairment

---

<sup>22</sup> Later Colombia (in 2007) and Peru (in 2008) also introduced dynamic provisioning. For the Spanish background to introduce dynamic provisioning see Fernandez de Lis and Herrero (2010).

<sup>23</sup> See also Mann and Michael (2002), p. 133.

<sup>24</sup> The standard approach establishes six risk categories ranging from “Without risk” to “High risk” and for each category a risk weight is allocated. For example, for a 100 EUR loan within the “High risk” (“Without risk”) category the bank has to recognize a statistical provision of 1.5 % (0.0 %), i.e. 1.5 (0) EUR.

<sup>25</sup> For a more detailed discussion, see Fernandez de Lis et al. (2001) and Mann and Michael (2002).

provisions of IAS 39, in paragraph 23 it refers to Annex IX, which provides further detailed guidance to estimate credit losses. Annex IX contains comprehensive instructions on the classification of loans and on the calculation of the loan loss provision. In essence, the features of the previous provisioning regime have been retained. As a consequence of the new regulation, the general and the statistical provisions have been merged under the label “general provisions”. Hence, Spanish regulator has maintained their prudent and detailed loan loss provisioning practice, at least to a large extent, even under IFRS.

### *Portugal*

Similar to Spain, the regulator in Portugal has a tradition to set out very detailed provisioning rules which are formalized in a provisioning matrix. According to Article 115 paragraph 1 of *Legal Framework for Credit Institutions and Financial Companies* it is incumbent on the *Banco de Portugal* to set forth accounting standards to be applied by institutions subject to its supervision. Furthermore, *Decree-Law No 35/2005*<sup>26</sup> conferred upon the *Banco de Portugal* the right to regulate the scope and application of IAS/IFRS with respect to the consolidated accounts of companies subject to its supervision. In order to exercise this right the Banco de Portugal issued *Notice 1/2005* which requires the application of IAS/IFRS for consolidated accounts of *all* banks (i.e. also non-listed banks except for savings banks<sup>27</sup>). For the preparation of individual accounts the Notice requires the application of *Adjusted Accounting Standards*. The *Adjusted Accounting Standards* largely correspond with the IAS/IFRS with some important exceptions. One major exception is the maintenance of previous valuation and provisioning rules for credit granted.<sup>28</sup> Banks are required to maintain

---

<sup>26</sup> Decree-Law No. 35/2005 implements the IAS Regulation (EU Regulation 1606/2002) in Portugal.

<sup>27</sup> See Banco de Portugal (2004), p. 103.

<sup>28</sup> See Banco de Portugal (2004), p. 103-104.

minimum levels of specific and general provisions which are laid out in *Notice 3/1995* and *Notice 8/2003* of the *Banco de Portugal*.

As regards consolidated accounts the *Banco de Portugal* issued several regulations in order to adjust the calculation of regulatory capital through so called “prudential filters”. These prudential filters mainly neutralize effects of the wider use of fair value accounting. However, the respective *Notice 2/2005* also envisions the deduction of the sum of the differences – when positive – between the regulatory provisions defined by the *Banco de Portugal* (as defined by *Notice 3/1995* and *Notice 8/2003*) and accounting impairments, calculated in accordance with IAS/IFRS. As a further measure, transitional periods have been established to defer the prudential recognition of the effects occurring upon transition to IFRS. For example, for impacts arising from the change in the recognition and measurement criteria of financial instruments a deferral period of three years has been defined. Furthermore, provisions set up for securities under previous regulation which under IFRS are accounted for using fair values are not allowed to be released to income. Rather, they have to be recorded under a specific item of reserves that is not eligible for regulatory capital. Interestingly, as a final measure related with loan loss provisioning, the *Banco de Portugal* changed the regulatory treatment of general provisions. Since 2005 general provisions are accepted as a positive item of Tier 2 capital which was not the case before IFRS adoption. To sum up, the *Banco de Portugal* adopted the IFRS provisioning rules as they are, but at the same time the Portuguese regulator issued additional regulations that should dampen the effects of the new accounting regime. Specifically, the measures mentioned above are likely to serve as incentives for banks not to reduce their level of provisions extensively.

### *Denmark*

In contrast to the regimes outlined above, in Denmark supervisors rely less on formal rules. Accounting and regulation is principles based, however, strict enforcement is achieved through

frequent and strict on-site inspections. Under Danish GAAP loans had to be recognized at nominal value less provisions. Loan loss provisions were based on the probable risk of losses according to the prudential principle of accounting (Danmarks Nationalbank 2006, p. 18). Therefore, the Danish regulator required banks to make provisions for losses deemed to be unavoidable (B provisions) but also for foreseeable losses (A provisions). By considering all potential future losses loan book values under old Danish GAAP approximated market values (Bernard et al. 1995). However, “[u]nder the previous accounting rules based on the prudential principle the banking institutions’ loan loss provisions were not necessarily reflected in losses whereby the accumulated provisions partly served as buffer” (Danmarks Nationalbank 2006, p. 27). This suggests that substantial portions of loan loss allowances covered unidentified future credit risk which would be incompatible with IFRS. Hence, Danish banks are expected to have high reversals of unjustified reserves upon IFRS transition.

In the course of the introduction of IFRS there has been a switch from the prudential principle to the principle of neutrality (Danmarks Nationalbank 2007, p. 71). In fact, the Danish national accounting standards for credit institutions have also been adjusted to match IFRS rules. According to section 196 of the Financial Business Act the Danish Financial Supervisory Authority (DFSA) has the authority to “lay down more detailed regulations on the annual report, including regulations on the recognition and measurement of assets, liabilities, revenue and expenditure, presentation of the income statement and balance sheet, and requirements regarding notes and the management’s review”. As a consequence, the DFSA issued Executive Order (EO) No. 1466 on Financial Reports for Credit Institutions and Investment Companies, etc”. Section 1 paragraph 2 of the EO makes clear that the provisions of the order are applicable for IFRS-adopters only insofar as IFRS do not regulate an accounting matter. This means that in contrast to the Spanish and Portuguese regulators the DFSA accepts the primacy of IFRS. In addition, the provisions in the EO that have to be primarily followed by banks applying

Danish GAAP have been significantly adjusted in order to achieve a higher degree of convergence with international accounting standards. Sections 51 to 54 of the EO on the recognition of impairment of loans and receivables largely resemble the respective provisions of IAS 39.

In contrast to the regulators in Portugal and Spain, the DFSA does not issue further guidelines on loan loss provisioning. It relies on the valuations used by banks according to IAS 39. The DFSA finds that “the rules for recognition of impairment losses/provisions laid down in the IAS standards and implemented in the Danish regulation give a sufficient measurement of banks’ asset quality” (IMF 2007, p. 27). However, according to Section 124 paragraph 6 the DFSA may require banks to write down assets, etc. for the purpose of calculation of the capital base. To sum up, the Danish supervisor accepts and enforces compliance with the IAS/IFRS impairment rules, but under certain circumstances, it can force banks to change their level of loan loss provisions.

#### *United Kingdom*

In the UK there were only general rules on loan loss provisioning. According to the UK *Accounting Standards Board (ASB)* the *British Bankers’ Association (BBA)* has the right to issue *Statements of Recommended Accounting Practice (SORP)*. The *BBA’s SORP* have several recommendations in paragraphs 7 to 22 regarding provisioning. Generally, valuation of loans should reflect any decrease of their realizable amount below their cost (*SORP*, paragraph 8). According to the recommendations a loan is deemed to be “impaired when, based on current information and events, the bank considers that the creditworthiness of a borrower has undergone a deterioration such that it no longer expects to recover the advance in full” (*SORP*, paragraph 12). In such a case a specific provision should be recognised, the amount of which should reflect the bank’s estimate of the amount needed to reduce the carrying value to the

expected net realizable value. The *SORP* do not limit the recognition of impairment to specific triggers, rather it requires that loan loss provisions should be considered whenever information available suggests impairment. As regards general loan loss provisions paragraph 17 of *SORP* states that: "Experience shows that portfolios of advances often contain advances which are in fact impaired at the balance sheet date, but which will not be specifically identified as such until some time in the future". To cover such not yet identified impaired loans in portfolios a general loan loss provision should be made. Interestingly, the cited text has a similar wording as IAS 39 related to the collective provisions ("incurred but not reported losses"). However, under UK provisioning practice some banks implemented forward-looking elements in their provisioning policies (Mann and Michael 2002).

The UK supervisory authority, the *Financial Services Authority (FSA)*, does not set any further requirements regarding loan loss provisioning. The supervisory regime is less prescriptive than in other countries and puts more emphasis on policies that promote good corporate governance and market discipline (IMF 2003, p. 10). Concurrent with IFRS adoption the *ASB* issued *FRS 26: Financial Instruments: Recognition and Measurement* which has to be applied by all listed banks starting from 1 January 2005. *FRS 26* implements the recognition and measurement requirements of IAS 39 for financial instruments into UK GAAP. For IFRS adopters the *FSA* judges banks' provisioning practices against IAS 39 requirements. In its Consultation Paper 04/17 *Implications of a changing accounting framework (CP04/17)* the *FSA* addresses several regulatory issues arising from the application of IFRS. As regards provisioning the *FSA* only discusses the treatment of general loan loss provisions, which under UK GAAP have been treated as part of regulatory capital (within Tier 2). *CP04/17* proposes to give the same capital treatment to collective provisions under IAS 39 as to general loan loss provisions under UK GAAP. This is remarkable because conceptually collective provisions

under IFRS should merely cover incurred losses, while general loan loss provisions include some forward-looking elements.

### Appendix C. Estimating asset value (V), and asset volatility ( $\sigma_V$ )

We follow Ronn and Verma (1986) to estimate the market value of assets,  $V$ , and the instantaneous standard deviation of the rate of return on the value of the bank's assets,  $\sigma_V$ . We first obtain values for  $V$  and  $\sigma_V$  by solving two equations simultaneously. The first equation states  $\sigma_V$  as a function of market value of equity ( $E$ ), asset value ( $V$ ), and the instantaneous standard deviation of return on equity over the prior twelve-month period ( $\sigma_E$ ):

$$\sigma_V = \frac{\sigma_E E}{VN(x)} \quad (\text{I})$$

where

$$x \equiv \frac{\ln\left(\frac{V}{\rho D}\right) + \sigma_V^2 T/2}{\sigma_V \sqrt{T}}.$$

Following Ronn and Verma (1986) the second equation models the market value of a bank's equity as a call option on the bank's assets:

$$E = VN(x) - \rho DN(x - \sigma_V \sqrt{T}) \quad (\text{II})$$

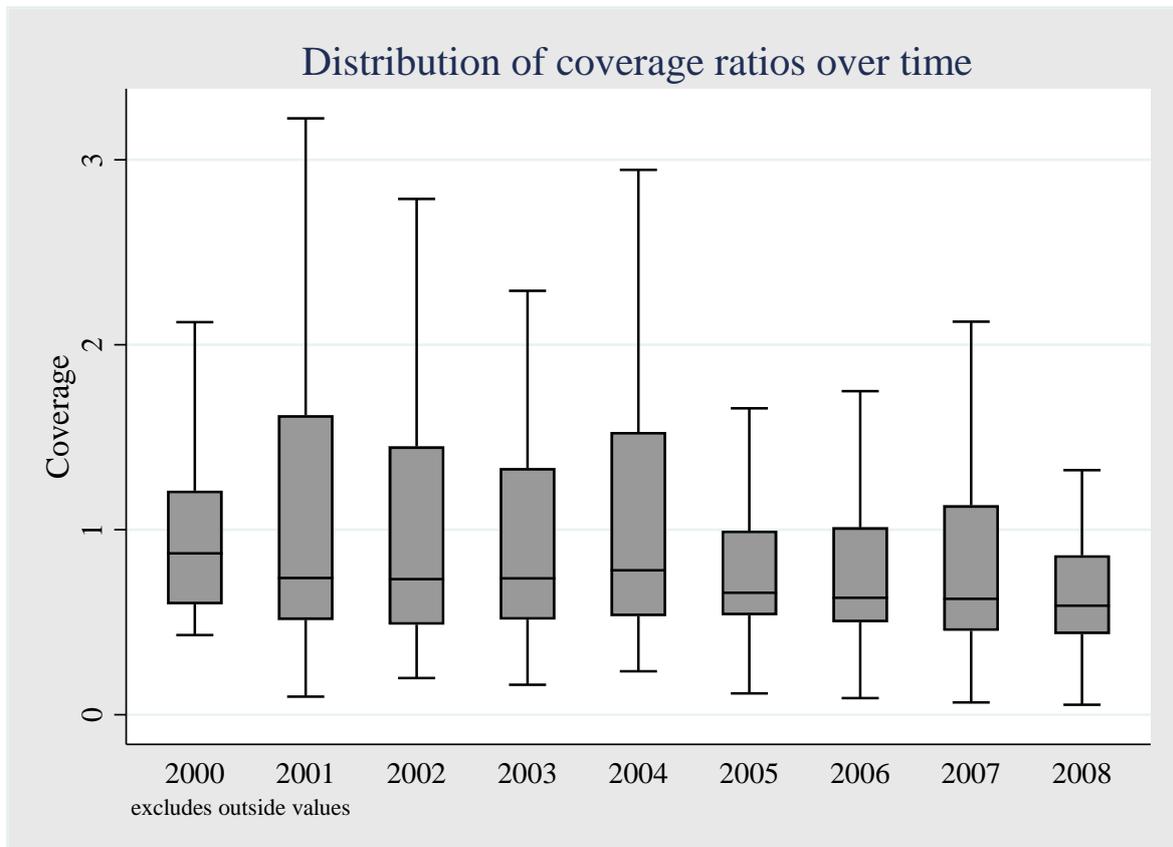
$N(\cdot)$  is the cumulative density of a standard normal random variable.  $\rho$  is the forbearance parameter representing a hypothetical limit until which the deposit insurer refrains from stepping in to dissolve the banks' assets. Following Ronn and Verma (1986) we set this parameter equal to 0.97, which allows the asset value to deteriorate to 97% of debt value before the option is called.  $T$  is the time until the next audit by the deposit insurer, which is set equal to 1. In equations (I) and (II),  $D$  represents the face value of deposits and other debt. Following prior research (e.g., Hovakamian and Kane 2000; Bushman and Williams 2012), we use the total liabilities as a proxy for  $D$ .

For the empirical implementation, we obtain market value of equity ( $E$ ) and total liabilities ( $D$ ) from Worldscope. We calculate the annual standard deviation of return on equity ( $\sigma_E$ ) using daily returns from Datastream. To ensure a balanced pre- and post-IFRS sample and to avoid

the influence of the financial crisis on market values, we restrict our analysis to the sample period from 2002 to 2007.

**FIGURE 1**

**Distribution of coverage ratios by provisioning regimes**



*Notes:* The figure depicts the distribution of coverage ratios (loan loss allowances divided by non-performing loans) for each sample year (pooled across countries) using box plots. The box plots provide the median (horizontal line within the boxes), the 25th and 75th percentile (lower and upper bound of the boxes), and adjacent values (end points of vertical lines/whiskers). Adjacent values are defined as the lowest and highest observations that are still inside the region spanned by the following limits: 25th (75th) percentile  $- (+) 1.5 \times (75\text{th} - 25\text{th percentile})$ .

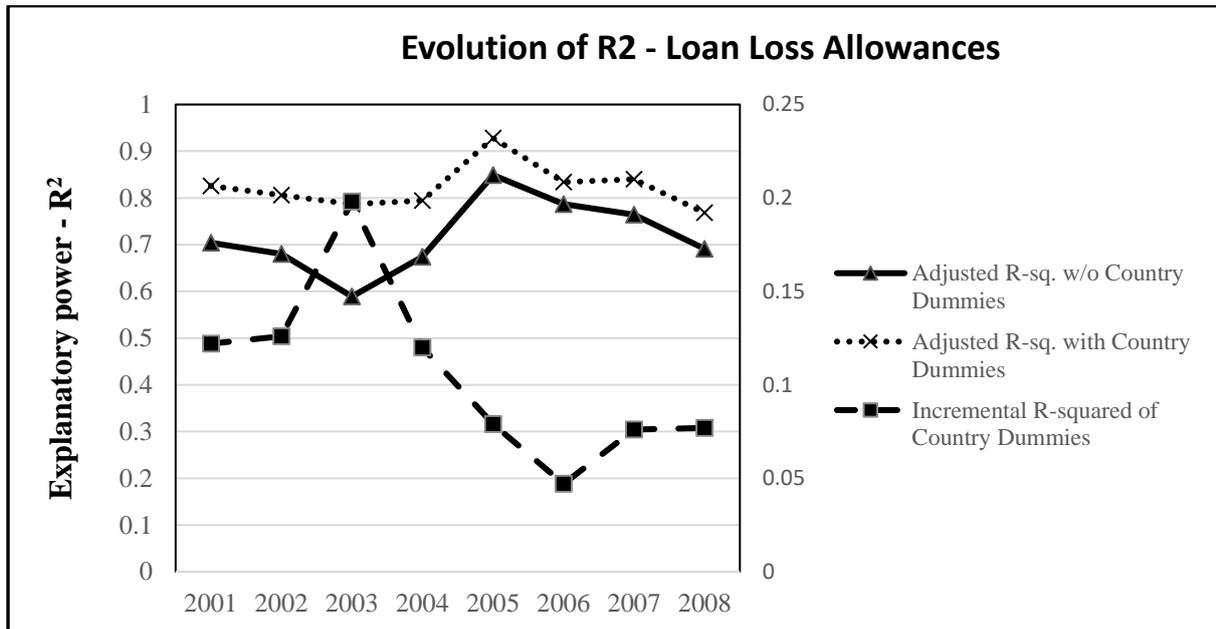
**FIGURE 2**

**Evolution of adjusted R<sup>2</sup> over time**

Adjusted R<sup>2</sup>:

$$LLA_{itj} = \beta_0 + \beta_1 NPL_{itj} + \beta_2 GCO_{itj} + \beta_3 Loans_{itj} + \beta_4 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \beta_6 \Delta Unemployment_{itj} + \text{Bank specialization dummies} + \varepsilon_{it} \quad (1a)$$

$$LLA_{itj} = \beta_0 + \beta_1 NPL_{itj} + \beta_2 GCO_{itj} + \beta_3 Loans_{itj} + \beta_4 Size_{itj} + \beta_5 GDP\ Growth_{itj} + \beta_6 \Delta Unemployment_{itj} + \text{Bank specialization dummies} + \text{Country Dummies} + \varepsilon_{it} \quad (1b)$$



Notes: The figure depicts the yearly evolution of the adjusted R-squareds for the nested model (1a) (solid line), the non-nested model (1b) (dotted line) and the incremental R-squareds of the country dummies (dashed line).

**TABLE 1**  
**Sample distribution by country and specialization**

**Panel A: Sample distribution by country**

Country	No. banks	No. of observations		
		Local GAAP	IFRS	Total
Belgium	3	14	11	25
Denmark	7	33	27	60
Finland	2	4	6	10
France	9	39	32	71
Greece	7	17	24	41
Ireland	4	20	15	35
Italy	25	95	85	180
Netherlands	6	24	24	48
Portugal	5	23	20	43
Spain	8	32	31	63
Sweden	4	19	15	34
United Kingdom	9	43	35	78
<b>TOTAL</b>	<b>89</b>	<b>363</b>	<b>325</b>	<b>688</b>

**Panel B: Sample distribution by specialization**

Specialization	No. banks	No. of observations		
		Local GAAP	IFRS	Total
Commercial	59	232	215	447
Cooperative	11	44	36	80
Savings Bank	2	9	8	17
Bank Holding	16	73	63	136
Real Estate	1	5	3	8
<b>TOTAL</b>	<b>89</b>	<b>363</b>	<b>325</b>	<b>688</b>

*Notes:* The sample comprises 89 banks that mandatorily adopted IFRS. The sample covers the period from 2000 to 2008.

**TABLE 2**  
**Descriptive statistics of variables used in analyses**

<i>Variable</i>	<b>Before Mandatory IFRS Adoption</b>						<b>After Mandatory IFRS Adoption</b>					
	N	mean	p25	p50	p75	sd	N	mean	p25	p50	p75	sd
<i>Coverage ratio</i>	363	1.542	0.519	0.759	1.481	2.453	325	1.071	0.480	0.640	0.955	1.791
<i>LLA</i>	269	0.024	0.012	0.019	0.032	0.017	287	0.021	0.009	0.017	0.027	0.019
<i>NPL</i>	269	0.031	0.009	0.020	0.044	0.030	287	0.034	0.010	0.023	0.044	0.037
<i>GCO</i>	269	0.004	0.001	0.003	0.006	0.004	287	0.004	0.001	0.002	0.005	0.007
<i>Loans</i>	269	0.618	0.550	0.632	0.719	0.145	287	0.651	0.576	0.674	0.770	0.171
<i>Size</i>	269	10.775	9.443	10.814	12.381	1.841	287	11.160	9.937	11.195	12.781	1.897
<i>GDP Growth</i>	269	0.021	0.005	0.019	0.032	0.017	287	0.020	0.009	0.020	0.030	0.018
<i>ΔUnemployment</i>	269	0.005	-0.058	-0.026	0.082	0.127	287	-0.025	-0.103	-0.026	0.021	0.111

*Variable definitions:* *Coverage ratio*, loan loss allowance divided by non-performing loans; *LLA*, loan loss allowance scaled by total loans outstanding; *NPL*, non-performing loans scaled by total loans outstanding; *GCO*, gross charge-offs scaled by average loans outstanding for the year; *Loans*, loans outstanding scaled by total assets; *Size* is the natural logarithm of total assets. *GDP Growth* and *Unemployment* are obtained from the World Bank. Data for the construction of all the remaining variables are hand collected from banks' annual reports.

**TABLE 3**  
**Comparability of coverage ratios**

**Panel A: Median coverage ratios across EU countries**

Country	pre-IFRS	post-IFRS
Belgium	0.696	0.710
Denmark	4.479	0.568
Finland	0.844	0.868
France	0.851	0.841
Greece	0.709	0.623
Ireland	1.622	0.709
Italy	0.470	0.538
Netherlands	0.849	0.503
Portugal	1.642	1.579
Spain	2.474	2.381
Sweden	0.739	0.776
United Kingdom	0.515	0.518

**Panel B: Distribution of median country-level coverage ratios**

	pre-IFRS	post-IFRS
Mean	1.324	0.885
Q1	0.706	0.560
Median	0.847	0.709
Q3	1.637	0.861
Interquartile Range	0.931	0.301
Range	4.009	1.878
Std Error	0.333	0.160

**Panel C: Pairwise differences in median country-level coverage ratios**

<i>Statistic</i>	pre-IFRS	post-IFRS
	Absolute pw. Diff.	Absolute pw. Diff.
Mean	1.110	0.520
Q1	0.161	0.109
Median	0.792	0.228
Q3	1.656	0.869
Interquartile Range	1.495	0.761
Range	4.008	1.878
Std Error	0.148	0.072
<i>Change in pairwise differences from pre-IFRS to post-IFRS</i>		
	<i>Magnitude of change</i>	<i>p-value</i>
Mean	-0.590	0.0003
Median	-0.077	0.0001
% of decreases in pw. differences	0.712	0.0008

*Notes:* This table shows the variation in and distributional characteristics of differences in median country-level coverage ratios. Panel A reports median coverage ratios by country. Panel B reports the distributional statistics for the median coverage ratios reported in Panel A. Panel C shows the distribution of the absolute magnitudes of pairwise differences in median country-level coverage ratios and reports test statistics for the change in pairwise differences from the pre- to post-IFRS period.

**TABLE 4**  
**Comparability of loan loss allowances**

	Pre-IFRS		Post-IFRS		Pre-IFRS		Post-IFRS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>
<i>NPL</i>	0.374*** (14.40)	0.467*** (10.90)	0.401*** (7.68)	0.446*** (7.18)	0.350*** (10.7)	0.474*** (12.4)	0.386*** (7.90)	0.457*** (8.22)
<i>GCO</i>	0.992*** (3.53)	0.452* (1.69)	0.660*** (2.85)	0.520** (2.49)	0.846** (2.48)	0.420 (1.35)	0.458*** (2.80)	0.365*** (2.74)
<i>F_GCO</i>					0.264 (1.10)	-0.0440 (-0.18)	0.889*** (4.80)	0.753*** (4.25)
<i>Loans</i>	-0.015*** (-2.68)	-0.009*** (-2.61)	0.003 (0.84)	-0.004 (-1.15)	-0.016*** (-2.66)	-0.009*** (-2.61)	0.004 (1.27)	-0.003 (-0.91)
<i>Size</i>	-0.001*** (-2.74)	-0.001* (-1.68)	0.000 (0.56)	0.000 (1.05)	-0.001*** (-2.83)	-0.001 (-1.27)	-0.000 (-0.32)	0.000 (0.09)
<i>GDP Growth</i>	0.003 (0.08)	-0.008 (-0.19)	0.048 (1.09)	0.039 (0.86)	-0.004 (-0.11)	0.005 (0.13)	-0.014 (-0.29)	-0.054 (-0.59)
$\Delta$ <i>Unemployment</i>	0.010** (2.21)	-0.004 (-1.22)	-0.005 (-1.09)	-0.008 (-1.57)	0.009* (1.95)	-0.003 (-1.10)	-0.004 (-0.69)	-0.002 (-0.28)
Bank specialization dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	Yes	No	Yes	No	Yes	No	Yes
Observations	269	269	287	287	267	267	209	209
Adjusted R <sup>2</sup>	0.644	0.824	0.757	0.817	0.646	0.827	0.847	0.906
Incremental Adj. R <sup>2</sup> Country	0.180		0.060		0.181		0.059	
Diff-in-Diff Adj. R <sup>2</sup>	<b>-0.120***</b>				<b>-0.122***</b>			

Notes: *F\_GCO* is one-year-ahead *GCO* (i.e.,  $GCO_{t+1}$ ). All other variables are defined in Table 2. \*\*\*, \*\*, \* significant at the 1%, 5% and 10% level, respectively.

TABLE 5

## The impact of supervisory intervention on the comparability of coverage ratios

**Panel A: Pairwise differences in median coverage ratios by country**

Country	pre-IFRS	post-IFRS	Change
<b>Denmark</b>	<b>3.441</b>	<b>0.372</b>	<b>-3.070</b>
Ireland	1.003	0.336	-0.667
Italy	0.932	0.388	-0.544
United Kingdom	0.891	0.402	-0.488
Belgium	0.759	0.336	-0.423
Greece	0.752	0.352	-0.401
Sweden	0.741	0.348	-0.393
France	0.722	0.372	-0.351
Finland	0.722	0.386	-0.336
Netherlands	0.722	0.416	-0.306
<b>Portugal</b>	<b>1.014</b>	<b>0.903</b>	<b>-0.111</b>
<b>Spain</b>	<b>1.619</b>	<b>1.633</b>	<b>0.014</b>

**Panel B: Comparison of the change across supervisory regimes**

	Mean	Median
Non-interventionist	-0.434	-0.047
Statistical	-0.048	-0.080
MVA	-3.070	-3.531
	<b><i>p-value</i></b>	<b><i>p-value</i></b>
<b>Statistical vs. Non-interventionist</b>	0.0946	0.7932
<b>MVA vs. Non-interventionist</b>	0.0000	0.0000
<b>MVA vs. Statistical</b>	0.0000	0.0000

*Notes:* This table reports the impact of supervisory intervention on the change in pairwise differences in median country-level coverage ratios. Panel A ranks countries in the order of the magnitude of the change in pairwise differences in coverage ratios from the pre- to post IFRS period, starting with the largest decrease on top. Panel B provides test statistics for the mean and median comparisons of changes in pairwise differences from the pre- to post-IFRS period between three different supervisory regimes: *non-interventionist* (Belgium, Finland, France, Greece, Ireland, Italy, Netherlands, Sweden, UK), *MVA* (“mark-to-market” accounting in Denmark), *Statistical* (statistical and dynamic provisioning in Portugal and Spain, respectively).

**TABLE 6**

**The impact of supervisory intervention on the comparability of loan loss allowances**

	Pre-IFRS		Post-IFRS		(5) Difference Post-Pre (4) - (2)	(6) Difference Statistical vs. MVA
	(1)	(2)	(3)	(4)		
	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>		
<i>NPL</i>	0.341*** (5.59)	0.500*** (9.97)	0.392*** (7.44)	0.467*** (8.88)		
<i>GCO</i>	0.816** (2.21)	0.298 (0.94)	0.467*** (3.01)	0.443*** (2.77)		
<i>F_GCO</i>	0.276 (1.12)	-0.079 (-0.31)	0.842*** (4.19)	0.716*** (3.55)		
<i>Loans_ta</i>	-0.017* (-1.77)	-0.021*** (-3.15)	0.004 (0.72)	-0.007 (-1.63)		
<i>Size</i>	-0.002** (-1.99)	-0.000 (-0.23)	-0.000 (-0.61)	0.000 (0.04)		
<i>GDP Growth</i>	0.050 (1.16)	0.076* (1.98)	0.010 (0.20)	0.036 (0.80)		
$\Delta$ <i>Unemployment</i>	0.013** (2.30)	0.010** (2.22)	-0.009 (-1.24)	-0.007 (-1.27)		
<i>Statistical</i>		0.017*** (8.49)		0.013*** (6.60)	-0.0045**	
<i>MVA</i>		0.025*** (4.33)		0.007* (1.74)	-0.0175***	-0.0129***
<i>Constant</i>	0.034*** (2.66)	0.016* (1.79)	0.004 (0.58)	0.003 (0.55)	-0.0129*	
Bank specialization dummies	No	No	No	No		
Observations	267	267	209	209		
Adjusted R <sup>2</sup>	0.599	0.758	0.842	0.881		

*Notes:* *MVA* takes the value of one for bank observations from Denmark, and zero otherwise; *Statistical* takes the value of one for bank observations from Portugal and Spain, and zero otherwise. All other variables are defined in Table 2. Standard errors are clustered at the bank level. \*\*\*, \*\*, \* significant at the 1%, 5% and 10% level, respectively.

**TABLE 7**

**Comparability of loan loss allowances by different pre-IFRS provisioning practices**

**Panel A: Descriptive statistics of loan loss allowances in the transition year**

Country	LLA Local GAAP			LLA IFRS		% change LLA		% Increase	% Decrease	% Zero change
	N	mean	p50	mean	p50	mean	p50			
Belgium	3	0.0124	0.0075	0.0156	0.0106	32.1%	37.8%	100.0%	0.0%	0.0%
Denmark	7	0.0346	0.0356	0.0311	0.0340	-12.7%	-11.7%	0.0%	100.0%	0.0%
Finland	1	0.0031	0.0031	0.0028	0.0028	-11.5%	-11.5%	0.0%	100.0%	0.0%
France	8	0.0437	0.0386	0.0467	0.0400	6.1%	4.9%	100.0%	0.0%	0.0%
Greece	7	0.0377	0.0354	0.0556	0.0374	38.2%	22.0%	85.7%	14.3%	0.0%
Ireland	4	0.0069	0.0068	0.0055	0.0051	-22.2%	-18.6%	0.0%	75.0%	25.0%
Italy	22	0.0338	0.0238	0.0299	0.0257	-13.9%	-14.5%	18.2%	81.8%	0.0%
Netherlands	6	0.0104	0.0098	0.0100	0.0098	-2.5%	-1.9%	40.0%	43.3%	16.7%
Portugal	4	0.0359	0.0290	0.0352	0.0306	1.4%	4.2%	75.0%	25.0%	0.0%
Spain	8	0.0212	0.0207	0.0207	0.0209	-2.5%	-0.1%	50.0%	50.0%	0.0%
Sweden	4	0.0046	0.0039	0.0046	0.0040	-0.2%	0.0%	50.0%	0.0%	50.0%
United Kingdom	10	0.0204	0.0096	0.0435	0.0102	28.9%	-1.1%	40.0%	60.0%	0.0%
Total	84	0.0270	0.0233	0.0301	0.0226	2.1%	-1.2%	43.8%	51.5%	4.8%

**Panel B: Comparability of loan loss allowances by different transition effect clusters**

	<i>Small transition effects</i>				<i>Large transition effects</i>			
	<b>Pre-IFRS</b>		<b>Post-IFRS</b>		<b>Pre-IFRS</b>		<b>Post-IFRS</b>	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>	<i>LLA</i>
<i>NPL</i>	0.424*** (16.2)	0.430*** (6.27)	0.445*** (14.3)	0.388*** (5.17)	0.303*** (7.81)	0.374*** (9.67)	0.368*** (5.18)	0.420*** (5.23)
<i>GCO</i>	0.577* (1.92)	0.244 (0.76)	0.952*** (2.93)	0.662*** (3.78)	0.877** (1.99)	0.310 (0.87)	0.500*** (2.77)	0.356** (2.32)
<i>F_GCO</i>	0.481* (1.71)	0.133 (0.41)	0.0224 (0.074)	-0.130 (-0.71)	0.393 (1.63)	0.145 (0.73)	1.003*** (3.98)	0.864*** (3.44)
<i>Size</i>	-0.033*** (-5.51)	-0.022*** (-3.13)	-0.007 (-1.32)	-0.011** (-2.61)	-0.012* (-1.75)	-0.006 (-1.08)	0.009* (1.69)	0.002 (0.35)
<i>Loans</i>	-0.002*** (-3.10)	-0.001** (-2.08)	-0.000 (-0.13)	-0.001* (-1.91)	-0.002*** (-2.75)	-0.000 (-0.52)	0.000 (0.57)	0.001 (0.93)
<i>GDP Growth</i>	-0.127*** (-2.94)	-0.011 (-0.34)	-0.135*** (-2.80)	-0.032 (-0.47)	-0.029 (-0.62)	0.018 (0.32)	0.026 (0.42)	-0.071 (-0.54)
<i>ΔUnemployment</i>	-0.012* (-1.85)	-0.004 (-0.97)	-0.006 (-0.75)	-0.000 (-0.00)	0.006 (1.01)	-0.001 (-0.26)	-0.009 (-0.90)	-0.001 (-0.095)
Bank specialization dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	Yes	No	Yes	No	Yes	No	Yes
Observations	101	101	75	75	152	152	120	120
Adjusted R <sup>2</sup>	0.864	0.951	0.870	0.952	0.638	0.824	0.868	0.904
Incremental Adj. R <sup>2</sup> Country	0.087		0.082		0.186		0.036	
Diff-in-Diff Adj. R <sup>2</sup>	<b>-0.005</b>				<b>-0.150***</b>			

Notes: Panel A presents the differences in loan loss allowance numbers (scaled by loans) reported under local GAAP versus IFRS in the transition year. Panel B replicates the analysis of Table 4 for sample partitions based on transition effects. The *Small transition effects* (*Large transition effects*) subsample includes banks with an absolute change in the loan loss allowance of less (more) than 6 percent in the transition year.

**TABLE 8**

**Predictive ability of the loan loss allowances**

**Panel A: Predicting one-year-ahead gross charge-offs**

	Pre-IFRS		Post-IFRS		(5) Difference in coefficients (4) - (2)
	(1) $GCO_{t+1}$	(2) $GCO_{t+1}$	(3) $GCO_{t+1}$	(4) $GCO_{t+1}$	
<i>LLA</i>	0.152*** (5.44)	0.136*** (5.03)	0.231*** (5.43)	0.232*** (5.30)	0.096***
<i>LLA_Statistical</i>		0.212*** (3.44)		0.160 (1.03)	-0.052
<i>LLA_MVA</i>		-0.000* (-1.69)		0.000 (0.61)	-0.000
<i>Size</i>	0.000 (0.62)	0.000 (1.43)	0.000 (0.76)	0.000 (1.10)	
<i>GDP Growth</i>	-0.004 (-0.24)	-0.006 (-0.30)	0.058** (2.21)	0.065** (2.34)	
$\Delta$ <i>Unemployment</i>	0.001 (0.45)	-0.000 (-0.15)	0.006** (2.01)	0.006** (2.01)	
<i>Statistical</i>		-0.005*** (-3.25)		-0.004 (-1.24)	
<i>MVA</i>		0.001 (0.89)		0.001 (1.27)	
Bank specialization dummies	Yes	Yes	Yes	Yes	
Observations	330	330	213	213	
Adjusted R <sup>2</sup>	0.291	0.312	0.498	0.494	

**Panel B: Predicting two-year-ahead gross charge-offs**

	Pre-IFRS		Post-IFRS		(5) Difference in coefficients (4) - (2)
	(1) $GCO_{t+2}$	(2) $GCO_{t+2}$	(3) $GCO_{t+2}$	(4) $GCO_{t+2}$	
<i>LLA</i>	0.134*** (3.32)	0.118*** (2.84)	0.260*** (3.25)	0.262*** (3.10)	0.144*
<i>LLA_Statistical</i>		0.235*** (3.51)		0.064 (0.32)	-0.171
<i>LLA_MVA</i>		-0.000 (-0.82)		0.000 (0.74)	-0.000
<i>Size</i>	0.000 (0.14)	0.000 (0.60)	0.000 (0.65)	0.000 (0.74)	
<i>GDP Growth</i>	-0.005 (-0.20)	-0.007 (-0.23)	0.062* (1.70)	0.066* (1.77)	
$\Delta$ <i>Unemployment</i>	-0.000 (-0.08)	-0.001 (-0.66)	0.008* (1.97)	0.008 (1.51)	
<i>Statistical</i>		-0.006*** (-3.72)		-0.001 (-0.25)	
<i>MVA</i>		-0.000 (-0.05)		0.001 (0.91)	
Bank specialization dummies	Yes	Yes	Yes	Yes	
Observations	334	334	134	134	
Adjusted R <sup>2</sup>	0.220	0.244	0.496	0.483	

*Notes:* This table reports regression results for the predictive ability of loan loss allowances for one-year-ahead gross charge-offs ( $GCO_{t+1}$ ) in Panel A and two-year-ahead gross charge-offs ( $GCO_{t+2}$ ) in Panel B. *MVA* takes the value of one for bank observations from Denmark, and zero otherwise; *Statistical* takes the value of one for bank observations from Portugal and Spain, and zero otherwise. All other variables are defined in Table 2. Standard errors are clustered at the bank level. \*\*\*, \*\*, \* significant at the 1%, 5% and 10% level, respectively.

**TABLE 9**

**Comparability of loan loss allowances and risk sensitivity of leverage**

**Panel A:**

**Sensitivity of leverage to changes in risk by country pre- and post-IFRS adoption**

Country	Pre-IFRS (2002-2004)		Post-IFRS (2005-2007)	
	<i>Sensitivity (<math>\alpha_1</math>)</i>	N	<i>Sensitivity (<math>\alpha_1</math>)</i>	N
Belgium	1.1656	9	-1.2794	9
Denmark	-0.4474	21	-1.1161	21
France	-0.8277	16	-1.4614	18
Greece	-1.1069	21	-1.3582	21
Ireland	-2.2959	13	-3.3019	11
Italy	-1.2511	48	-1.9409	44
Netherlands	0.2145	9	-0.9182	9
Portugal	-1.3806	12	-1.2019	12
Spain	-0.3412	24	-2.3623	24
Sweden	-3.8946	12	-2.1262	12
United Kingdom	0.5226	30	-0.1825	30
Total		215		211
Mean	-0.88		-1.57	
Q1	-1.32		-2.03	
Median	-0.83		-1.36	
Q3	0.21		-1.12	
Interquartile				
Range	1.53		0.92	
Range	5.06		3.12	
Std Error	0.42		0.25	

**Panel B:**

**Distribution of pairwise (country-by-country) differences in the sensitivity of leverage to changes in risk**

<i>Statistic</i>	pre-IFRS		post-IFRS	
	Signed pw. Diff.	Absolute pw. diff.	Signed pw. diff.	Absolute pw. diff.
Mean	-0.4939	1.5942	0.0523	0.9478
Q1	-1.7307	0.7138	-0.8358	0.3532
Median	-0.4235	1.3503	-0.0788	0.9009
Q3	0.9701	2.4167	0.9396	1.2462
Interquartile				
Range	2.7008	1.7029	1.7755	0.8930
Range	9.4775	4.9540	5.3053	3.0419
Std Error	0.2592	0.1570	0.1598	0.0946

**Panel C:**  
**Mean pairwise (country-by-country) differences in the sensitivity of leverage to changes in risk by country**

Country	Pairwise differences in <i>Sensitivity</i> ( $\alpha_1$ )		Change	Change in absolute pw. diff.	Median TransEff_LLA
	pre-IFRS	post-IFRS			
Belgium	2.246	0.318	-1.929	-1.589	0.378
Denmark	0.472	0.497	0.025	-0.419	-0.117
France	0.054	0.117	0.064	-0.445	0.049
Greece	-0.253	0.231	0.484	-0.483	0.220
Ireland	-1.561	-1.907	-0.346	0.026	-0.186
Italy	-0.412	-0.410	0.002	-0.372	-0.145
Netherlands	1.200	0.715	-0.485	-0.590	-0.019
Portugal	-0.554	0.403	0.957	-0.560	0.042
Spain	0.589	-0.874	-1.463	-0.113	-0.001
Sweden	-3.320	-0.614	2.706	-2.424	0.000
United Kingdom	1.539	1.524	-0.015	-0.144	-0.011

**Panel D: The association between pairwise (country-by-country) differences in the sensitivity of leverage and transition effects on loan loss allowances**

	(1)	(2)	(3)	(4)
	Pairwise differences in <i>Sensitivity</i> ( $\alpha_1$ )		Change in pw. diff.	Change in absolute pw. diff.
	pre-IFRS	post-IFRS		
TransEff_LLA	3.927**	1.988	-1.938	-1.935**
	-2.24	-1.36	(-0.95)	(-3.02)
Constant	-0.0751	-0.0381	0.0371	-0.609**
	(-0.18)	(-0.14)	-0.11	(-3.07)
Observations	110	110	110	110
Adjusted R-squared	0.086	0.059	0.028	0.052

*Notes:* This table reports the distributional characteristics of the sensitivity of bank leverage to changes in risk. *Sensitivity* is the coefficient on changes in asset risk ( $\Delta\sigma V$ ) obtained from an OLS regression of changes in debt-to-assets ( $\Delta D/V$ ) on changes in asset risk ( $\Delta\sigma V$ ) (i.e., the  $\alpha_1$  coefficient from equation (3)). Panel A reports the sensitivity of bank leverage to asset risk (*Sensitivity*) for each country and pre- and post-IFRS period separately, and the distributional statistics for the country-level *Sensitivity* coefficients. Panel B reports the distributional statistics for the pairwise (country-by-country) differences in the country-level sensitivities of leverage to asset risk. Panel C reports the mean pairwise differences in country-level sensitivities of leverage to asset risk by country and the median country-level IFRS transition effects on the loan loss allowance from Table 7 Panel A (*TransEff\_LLA*). Panel D shows the results for the regression pairwise differences in country-level sensitivities of leverage to asset risk (*Sensitivity*) on median country-level IFRS transition effects on the loan loss allowance (*TransEff\_LLA*). Standard errors are clustered at the country level. \*\*\*, \*\*, \* significant at the 1%, 5% and 10% level, respectively.

## Recent Issues

All CFS Working Papers are available at [www.ifk-cfs.de](http://www.ifk-cfs.de).

No.	Authors	Title
590	Enikő Gábor-Tóth and Dimitris Georgarakos	<i>Economic Policy Uncertainty and Stock Market Participation</i>
589	Christos Koulovatianos, Jian Li, and Fabienne Weber	<i>Market Fragility and the Paradox of the Recent Stock-Bond Dissonance</i>
588	Volker Brühl	<i>Clearing of euro OTC derivatives post Brexit - an analysis of the present cost estimates</i>
587	Salomon Faure and Hans Gersbach	<i>Loanable Funds vs Money Creation in Banking: A Benchmark Result</i>
586	Roman Goncharenko, Steven Ongena, and Asad Rauf	<i>The Agency of CoCo: Why Do Banks Issue Contingent Convertible Bonds?</i>
585	Christina E. Bannier and Milena Schwarz	<i>Gender- and education-related effects of financial sophistication on wealth accumulation: Evidence from heteroscedasticity-based instruments</i>
584	Christina E. Bannier und Dennis Sinzig	<i>Finanzwissen und Vorsorgespargverhalten</i>
583	Christina Bannier, Thomas Pauls, and Andreas Walter	<i>CEO-speeches and stock returns</i>
582	Nikolaus Hautsch and Stefan Voigt	<i>Large-Scale Portfolio Allocation Under Transaction Costs and Model Uncertainty</i>
581	Martin D. Gould, Nikolaus Hautsch, Sam D. Howison, and Mason A. Porter	<i>Counterparty Credit Limits: An Effective Tool for Mitigating Counterparty Risk?</i>