ADOPTION OF THE IFRS 9 STANDARD: WHAT HAS BEEN THE EFFECT ON BANKS' PROVISIONING POLICY ?

Abstract: This research is one of the first tests post-implementation of the IFRS 9. The results show that the introduction of IFRS 9 has overall translated into losses for banks on the day of the adoption; the magnitude of the impact has been manageable for most banks but with significant differences between banks. The negative effect of the adoption of IFRS 9 has been higher for banks based in countries most affected by the financial crisis. The tests show that banks have maintained their opportunistic behavior after the introduction of IFRS 9. Our results show that the LLPs reported under IFRS 9 are used to smooth earnings and manage capital. However, the strategies that banks follow differ across countries. Banks based in weakly rated countries maintain the level of their capital rather than engaging in capital management strategies that would affect earnings. In contrast, banks based in highly rated countries have continued to use provisioning to manage their capital despite the effect of the transition to Day One.

Keywords: IFRS 9; provisions; loans; banks; income smoothing; capital management; expected credit losses; sovereign rating.

JEL Classification: M41; M48

1. Introduction

The International Accounting Standards Board (IASB) superseded the IAS 39 standard by the IFRS 9 – *Financial Instruments* on 24th July 2014 to reconcile accounting and prudential practices in matters of loan loss provisions[1]. The new standard became effective on January 1st 2018 and recognizes provisions on financial instruments on an expected credit losses (ECL) basis instead of on the incurred losses approach retained in IAS 39. Such ECL-based provisioning has already been introduced in prudential regulation by the Basle Committee for Banking Supervision (BCBS, 2004) and implemented in several countries starting in 2007: This involves a cost for banks. Indeed, the pre-implementation tests conducted in the years preceding the implementation of IFRS 9 (European Banking Authority, 2017; Humblot, 2018) indicated that the expected losses recognition on existing performing assets would necessarily increase LLAs and affect banks' regulatory Tier 1 capital on the first time adoption of the new standard on January 1st 2018 (so-called Day One). The first post-implementation tests (EBA, 2018; Ernst & Young, 2019) were based on incomplete data and have confirmed these findings but, interestingly, the adoption of IFRS 9 was followed by a reduction in loan loss provisions (2018) in 2018.

The aim of this study is to investigate the effect of the adoption of IFRS 9 on bank's capital and whether the new standard affected banks' provisioning practices. The academic literature (Lobo and Yang, 2005; Bushman and Williams, 2012; Kilic, Lobo, Ranasinghe and Sivaramakrishnan, 2013) has demonstrated that bank managers have a certain degree of discretion in the determination of LLPs, which they use to smooth reported earnings, signal future income, and manage regulatory capital (Ryan, 2011; Lobo, 2017). The implementation of forward-looking provisioning may increase banks' managers discretion in the recognition of provisions and lead them to engage in opportunistic provisioning practices (Bushman and Williams, 2012).

Our intuition is that the ECL-based provisioning approach offers banks' managers a higher degree of flexibility in the determination of provisions because this standard provides no rule for the computation of provisions unlike in the incurred loss approach. ECL are used for the computation of risk-weighted assets (RWA) and provisions in the Basle 3 regulatory capital ratio[2]. They rely on three parameters: exposure at default (EAD), probability of default (PD), and loss given default (LGD). While the measurement of EAD is guided by clear rules, there is no universally accepted model to measure PD and LGD. The 'standard' approach (SA) introduced by the BCBS proposes to have recourse to credit rating agencies (CRAs) to calculate ECL while the internal rating-based approach (IRB) enables banks to use their internal

assessments of credit risk. As noted by the European Banking Authority (2017), "*the application of IFRS 9 also requires the use of judgement in the ECL assessment and measurement process, which could potentially affect the consistent application of IFRS 9 across credit institutions and the comparability of credit institutions' financial statements*". How banks will manage increased provisioning requirements and additional discretion on provisions is the goal of this research.

We include a sample of 92 banks based in 23 countries, which all report under IFRS standards; the sample also includes supranational financial institutions as well as national public banks. We first measured the impact of the implementation of IFRS 9 on banks' shareholders' equity on January 1st 2018; the impact was also measured for country clusters. The LLPs relative to loans under IFRS 9 in 2018 were compared with LLPs to loans under IAS 39 in 2017. We next investigated whether banks have maintained their opportunistic behavior—income smoothing and capital management—when recognizing provisions under IFRS 9. We applied the Lobo and Yang (2001) model to 2012-2018 financial data to assess the determinants of banks' provisions and identify discretionary elements related to income smoothing and regulatory capital management. We then used the same model to investigate whether banks have adjusted their discretionary provisions in reaction to the level of the Day One losses they suffered as a result of the implementation of IFRS 9. Finally, we compared the discretionary elements in banks' LLPs in 2018 and in the preceding years to identify a possible change in their opportunistic behavior resulting from IFRS 9.

Our research confirms that the implementation of IFRS 9 standard resulted in an increase in LLAs and a decrease in bank's shareholders' equity on January 1st 2018, which is more pronounced for countries with weak credit ratings. Our results constitute a first implementation test of the IFRS 9 and provide evidence for an association between provisions under IFRS 9 and CRAs' ratings. We argue that sovereign ratings have become a determinant of banks' provisions due to the introduction of ECL-based provisioning. The sovereign ceiling is applied by rating agencies to borrowers of a given country, and this explains the association between countries' ratings and provisions.

The paper provides evidence that IFRS 9 has allowed banks to maintain the opportunistic behavior observed in other research even into 2018. Bank managers have used their discretionary power in the recognition of provisions to smooth earnings and manage capital. We also found evidence of a discretionary element in the provision adjustment recognized on January 1st 2018; however, our results indicate that it was not homogenous. Banks based in highly rated countries have used the additional provisions recognized as a result

of the implementation of IFRS 9 to smooth earnings and manage capital. In contrast, no opportunistic behavior was observed for banks based in weak countries—these were faced with sizeable day-one losses and gave priority to the strengthening of their capital base.

This paper contributes to the nascent literature on ECL based provisioning. It shows that IFRS 9 offers opportunity to bank managers to smooth earnings, manage capital, and send signals to the market. It also constitutes a first post-implementation test of IFRS9 and provides evidence for the association between IFRS 9 provisions and ratings.

The remainder of this paper is presented as follows: The second section presents the institutional background surrounding the IFRS 9. The third section reviews prior studies and sets the hypothesis retained in the test, and the fourth section describes the methodology employed. The results are detailed in the fifth section, and the final section concludes.

2. Institutional background

2.1. Description of the IFRS 9

The IFRS 9 introduces substantial changes versus the IAS 39. The first change leads to a reclassification and a change in the measurement of certain financial assets. Under IAS 39, asset classification and measurement are based on the nature of assets. IFRS 9 amends the IAS 39 classification by requiring measures of financial assets based on the business model of the entity and no longer on the asset nature. In addition, the IFRS 9 requires financial instruments to respond to additional cash-flow characteristics that are designated at amortized cost or Fair Value through Other Comprehensive Income (FVOCI).

As far as the banks' reporting of provisions is concerned, the most important change is the measurement of LLPs based on ECL. The main critique addressed in the IAS 39 was the delay in loss recognition due to the incurred losses approach. The IFRS 9 presents a major change by requiring banks to record loan loss provisions on an ECL basis, which aims to smooth credit losses by recording provisions as soon as the financial asset is recognized on the balance-sheet or the bank has committed to disburse it. These expected loss-based provisioning applies for assets measured at amortized cost or at FVOCI as well as for some off-balance sheet items (guarantees; loans committed but not disbursed). These are processed according the three steps below (also called the three "buckets"):

1) At initial recognition, the bank shall measure the LLA for that financial instrument at an amount equal to the 12-month ECL;

2) If the credit risk on that financial instrument has increased significantly since initial recognition, then the bank shall measure the LLA for a financial instrument at an amount equal to the lifetime ECL.
3) For impaired loans[3], the bank shall measure the LLA at an amount equal to the lifetime EC and shall calculate the interest revenue based on the gross carrying amount adjusted for the loss allowance.

2.2. The expected effects of IFRS 9 on banks' capital

Accounting standard setters—IASB and European Financial Reporting Advisory Group (EFRAG)—expected the change in provisioning methods to have a negative impact on banks' earnings and on their regulatory capital, which would oblige them to either increase capital or reduce credit risk of financial instruments. First, on Day One, the implementation of IFRS 9 was expected to generate an increase in LLAs for most banks. As noted by O'Hanlon, Hashim, and Li (2015), this immediate reduction of the carrying amount was expected to give rise to Day One losses. Under IFRS 9, the banks record provisions for performing assets classified in Stages 1 and 2 in addition to those that are recognized as impaired. These additional provisions trigger an accounting loss on the day of the transition from IAS 39 to IFRS 9, which is recorded in the bank's retained earnings for fiscal year 2018. In addition, reclassifications of financial assets according to business model also impacts banks' capital. Actually, reclassifications consist in a change in accounting measurement, e.g. amortized cost to fair value. This involves a re-measurement of the financial asset, which affects banks' capital favorably or not.

The impact on regulatory capital is expected to be slightly less significant. Under the Basle 3 regulation, provisions are based on ECL and hence the IFRS 9 will lead to a convergence of accounting and prudential provisions. Besides, some aspects of the IFRS9 standard will have a positive impact on bank's regulatory capital[4]. Novotny-Farkas (2016) reminds us that Basel 3 allows a portion of collective loan loss allowances in other reserves for the purpose of the computation of regulatory capital—these allowances are a component of tier 2 capital[5]. Thus, when switching to IFRS 9, the reinstatement of general provisions could have a positive impact on banks' regulatory capital ratio[6]. In addition, for EU-based banks, the ECB has authorized transitional arrangements that will enable banks to 'add back' a portion of the negative regulatory capital adjustment and thus reduce the impact of increased IFRS 9 provisions.

Thus, the transition to IFRS 9 implies an overall negative impact on banks' regulatory capital and shareholder's equity all other things being equal. Several pre-implementation

studies conducted by Humblot (2018) and the EBA (2017) demonstrated that the transition to IFRS 9 would have a negative impact on retained earnings on Day One due to the recognition of higher LLAs resulting from their computation based on ECL[7]; thus, the transition leads to a reduction in the Basel capital ratio. In one of the very first studies on the impact of the adoption of IFRS 9 on banks' earnings and capital, Deloitte (2019) used questionnaires sent to banks and found that the implementation of the new standard would increase loan impairment provisions on January 1st 2018. The positive effect on tier 2 was not fully offset on Day One—there was a negative impact of higher provisions under IFRS 9. However, the authors noted that the Day One impact was not substantial because of the favorable effect of reclassifications and re-measurements of assets allowed under IFRS 9. This study also found that the LLPs recognized in 2018 decreased. This unexpected finding is explained by a significant increase in write-offs made by banks that year, which translated into a decrease in Stage 3 loan exposure. Another questionnaire and post-implementation test released by the EBA (2018) confirmed that the impact of IFRS 9 adoption did have a negative effect on bank's capital ratios, but this effect was not significant. The findings were consistent with the pre-implementation test conducted on the basis of a questionnaire sent to banks in 2018. The banks used the IRB approach to compute ECL, which are less impacted than those using the SA. These results concur with a study from Ernst and Young (2019) based on the first quarter financial statements. These results show that the overall increase in LLAs on Day One was relatively low for banks. The study provides evidence for the favorable impact of the reclassification of assets (loans transferred from amortized cost to fair value through P&L, which do not need allowances) and for a number of asset write-offs made simultaneously with the implementation of IFRS 9 in 2018.

3. Prior literature and hypotheses

3.1. The existing literature

The opportunistic practices of bank managers have been at the heart of academic research on provisioning methods. The existence of a dual approach for bank provisioning—incurred loss used by accounting standard setters and expected loss advocated by regulatory bodies—paved the way for opportunistic behavior by bank managers (Bushman and Landsman, 2010; Balla et al., 2012). With the introduction of the Basel 2 framework in 2004, regulators have obliged banks to anticipate credit losses. Banks have to recognize large provisions when conditions are favorable and release them to absorb losses in times of economic downturn (Balla and Rose, 2015). Hence, prudential LLPs are generally higher than provisions reported by

accountants whose objective is the transparency of financial statements and the fair valuation of assets and liabilities (Gaston and Wong, 2014). With the introduction of IFRS 9, accounting standard setters respond to criticism by aligning accounting provisions on regulators' more conservative practices. However, under both approaches, bank managers have a degree a of discretion to determine the level of provisions.

The literature identifies three incentives for banks to manage provisions: income smoothing, capital management, and signaling future earnings or loan portfolio quality. Income smoothing by discretionary LLPs offers the main hypothesis underlying prior studies showing a positive association of LLP and earnings before LLP. To test this hypothesis, the ordinary least squares regression of LLP or estimated discretionary LLP studied earnings and other variables that constituted the main method used. Thus, the income-smoothing hypothesis is supported by numerous studies from Greenawalt and Sinkey (1988); Wahlen (1994); Lobo and Yang (2001); Kanagaretnam, Lobo, and Yang (2005); Fonseca and Gonzalez (2008); Bushman and Williams (2012); and Kilic, Lobo, Ranasinghe. and Sivaramakrishnan (2013). Similarly, Andries, Gallemore, and Jacob (2017) found evidence that banks facing a higher tax rate are more willing to increase their LLP. In contrast, Collins, Shackelford, and Wahlen (1995) mitigate those findings because the bank's ability to use LLP for income smoothing depends on intrinsic factors as size, growth, and profitability. Furthermore, Ahmed, Takeda, and Thomas (1999) found a negative association with earnings before LLP.

Capital management incentive is an important topic for research related to the banking industry. As mentioned above, the collective LLP are considered to be a part of regulatory Tier 2 capital. Thus, the main hypothesis tested by several researchers is that banks seek to increase their general LLP to compensate for low levels of regulatory capital. The first studies focused on US banks' regulatory changes, which permitted loan loss allowances in primary capital without limits prior to 1990 (Ryan, 2011). Several studies regarding the pre-1990 changes supported the capital management hypothesis. Kim and Kross (1998) studied post-1990 regulatory changes and found that banks use LLP to manage capital in a lesser extent and better increase charge-offs. Overall, most authors who tested the capital management hypothesis have come to a positive conclusion: Ahmed et al. (1999), Lobo and Yang (2001), Leventis et al. (2011), Curcio and Hasan (2015), and Ozili (2017). Ahmed et al. (1999) showed that banks with higher level of LLA have weaker incentives to manage capital though provisions.

Discretionary provisions can also be used by bank managers to send a signal to market participants on next year's income or on the quality of the loan portfolio. Whalen (1994); Kanagaretnam, Lobo, and Mathieu (2003); and Eng and Nabar (2007) provided evidence for

the signaling hypothesis by investigating the statistical relationship between earnings and the discretionary element of LLPs recognized in the prior year. The use of provisions to signal the change in asset quality (Kanagaretnam et al. (2005) and Liu, Ryan, and Whalen (1997)) argued that LLPs can send a signal on future evolution in the loan portfolio quality; however, Ahmed at al. (1999) found no evidence for this signaling hypothesis.

In contrast, the empirical literature regarding the IFRS 9 is nascent due to its recent implementation. At the time this paper was written, no empirical study related to the actual impact of IFRS 9 on bank's reported financial results has yet been found in the academic literature. There is no study on the relationship between the ECL measurement model retained by banks for accounting purpose and the amount of LLAs and LLPs under IFRS 9.

The measurement of ECL relies on three key factors: EAD, PD, and LGD. It can further enhance the sensitivity and scenario analysis. Detailed guidance has been provided by the BCBS (2015) on the computation of ECL for regulatory purpose, and these include (as stated by the EBA (2017)) judgmental factors that may affect the comparability of ECL assessment across banks. Hence, these factors can introduce a higher degree of flexibility for management in the computation of LLAs and LLPs versus the incurred-loss model. Though banks are broadly aligned in their application of certain key areas of IFRS 9 impairment modelling judgments, there is, according to Deloite (2019), evidence for divergences between UK banks on the modelling of ECL. Such divergence raises questions about the comparability of provisions across banks[8].

According to the European Systemic Risk Board (2019), *'Given the recent entry into force of IFRS 9, any analytical attempts to quantify the impact of ECL models cannot use historical data derived from IFRS 9, but must instead remain largely theoretical, be structured as case studies, or rely on indirect sources of data*'. However, several pre-implementation tests of IFRS 9 all led to the same conclusions regarding their impact on bank's regulatory capital ratio. Regardless of the model used, the LLAs under IFRS 9 will be significantly higher on Day One than the loan loss reserves recognized under IAS 39.

3.2. Hypotheses setting

In prior sections of this paper, we discussed the effects of the implementation of IFRS 9 and its consequences on financial reporting—especially how the IFRS 9 impacts capital when the bank switches to IFRS9 as of January 1st 2018. We expect a negative impact of the implementation of IFRS 9 on bank's capital[9] because the implementation of the ECL-based provisions on unimpaired financial assets translates into losses reported on Day One. We also

expect that LLPs reported under IFRS 9 to be higher than LLP computed under IAS 39 in 2017. However, as noted in the Ernst & Young's post-implementation study (2019), banks have written-off a substantial amount of loans in 2018—especially low-quality loans that translated into a reduction in LLPs in 2018. Hence, the increase in LLPs induced by the adoption of IFRS 9 may prove difficult to verify due to the expected reduction in impaired assets in 2018.

We also anticipate significant differences in provisioning between banks based in different countries: ECL is expected to be higher for banks based in countries with low credit ratings or weak banking environments. This increased ECL will translate into higher provisioning under IFRS 9 and hence larger Day One losses.

H1a: We predict a negative effect on banks' capital on January 1st 2018 of the IFRS 9 introduction.

H1b: We anticipate that the Day One impact will be more significant for banks in risky countries, i.e. countries with low sovereign rating and/or weak banking environment.

According to the literature, banks use their discretionary power on LLPs either to smooth earnings (to signal incentive purposes) or to manage their regulatory capital. Consistent with the literature, we expect banks to use the increase in LLPs induced by the adoption of IFRS 9 in an opportunist way (H2): smooth earnings and manage capital. At the time of writing this paper, there is no testing for signal hypothesis—the results for year 2019 are not yet available. Hence, we predict:

H2a: A negative association between LLP as reported on December 31st 2018 and earning before LLP and taxes reported for 2018 (income management hypothesis).

H2b: A negative association between LLP as reported on December 31st 2018 and regulatory capital before LLA (capital management hypothesis).

We expect bank's opportunistic behavior to be affected by the implementation of the IFRS 9. Indeed, banks' opportunistic behavior is limited by their own resources, i.e. their capital and their internal capital generation, because increasing LLPs affects distributable income and capital. We know from the literature (and test presented in this paper) that the adoption of IFRS

9 had an overall negative impact on bank's capital on Day One, i.e. January 1st 2018. This impact will differ across countries depending on their credit quality and on the strength of their banking system. Hence, we anticipate that banks which have weak financial fundamentals and operate in countries with low rating and weak banking system to behave differently from other banks. In addition, public financial institutions—which are not subject to bank regulations and are not profit-seeking—should not adopt opportunistic behavior.

Banks operating in a favorable environment will suffer lower Day One losses and will maintain their opportunistic behavior in 2018, i.e., increase their LLPs to smooth earnings and manage capital. In contrast, banks operating in a more difficult environment will have to face higher Day One losses and will dedicate 2018 earnings to strengthening their capital; therefore, they will not increase their LLPS to increase earnings and manage capital. Our hypotheses are formalized in H3a and H3b as follow:

H3a: We predict that banks based in countries that resisted the transition to IFRS 9 will have a negative association between LLPs and Day One impact on retained earnings and/or other capital reserves.

H3b: We predict weaker banks will have a positive association between LLPs and Day One impact on retained earnings and/or other capital reserves.

4. Research design, sampling, and descriptive statistics

4.1. Selected sample and descriptive statistics

To test these hypotheses, we manually collected data on 92 European and supranational banks having adopted IFRS 9 on January 1st 2018. The data consisted of information extracted from the 2018 financial statements on retained earnings and loan loss reserves as of 31st December 2017 (under IAS 39) as well as LLAs as of January 1st 2018 and 31st December 2018 under IFRS 9 (cost of risk for 2018). LLAs and variation in LLAs were broken down in three categories of financial instruments: financial instruments at amortized cost, financial instruments at FVOCI, and off-balance-sheet commitments. Within each category, we separately collected LLAs for each bucket (1, 2, and 3). In parallel, we collected historical data from 2011 to 2018 on a series of financial indicators used to assess the discretionary element of provisions from the Bank Focus database provided by Bureau Van Dijk and Moody's.

4.2. Methodology

The methodology follows a three-step research design.

First, an analysis of data collected based on descriptive statistics was performed to test H1. The amount of LLAs at January 1st 2018 and at 31st December 2017 are measured against total assets. The ratio of the impact of the transition to IFRS 9 reported in 2017 was retained earnings. The ratio to shareholders' equity was also computed to measure and compare the impact of the transition from IAS 39 to IFRS 9 for each bank.

We next tested the hypothesis of an opportunist use of LLPs for income smoothing and capital management (H2). Due to the adoption of IFRS 9 in 2018, provisions are based on ECL and are expected to be higher than under IAS 39; comparing them with a model obtained with pre-IFRS 9 variables has limited (if no) sense. This does not mean that the income smoothing hypothesis is abandoned because there is still an incentive for banks to increase LLPs when profits increase, but it has to be tested in a different way. We opted for the model developed by Lobo and Yang (2001) to determine the LLPs:

$$LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \varepsilon_{it} \quad (1)$$

In contrast to Lobo and Yang (2001), we did not test the signal hypothesis in our modified version of their model. As explained above, the exclusion of the signal hypothesis variable in the Equation (1) is imputable to the timing of this research; the one-year-ahead results (2019) are not yet available at the time of writing.

This model distinguishes between non-discretionary components of LLPs—for which the coefficient assigned is noted β_i—and discretionary elements noted as δ_i for earnings management and γ_i for capital management. More precisely, term LLP_t is the dependent variable relating the amount of loan loss provisions at *t* scaled by total assets. Other non-discretionary independent variables are defined as follows: $\Delta LOAN_t$ denotes the change in total gross loans from *t-1* to *t*; $CHOFFS_t$ are net charge-offs computed by the sum of LLA at *t-1* and LLP at *t* minus LLA at *t*. All are scaled by total assets. LLA_{t-1} is the amount of loan loss allowances at the beginning of the year by total assets, and NPL_{t-1} and ΔNPL_t is the amount of non-performing loans at the beginning of the year and the change in NPL from *t-1* to *t*, respectively; all values are scaled by total assets.

Regarding discretionary LLPs' variables, $EBLLPT_t$ is our proxy for earnings management and denotes earnings before LLP and taxes at t. $CAPB_t$ is the Tier 1 capital, i.e., the regulatory capital before loan loss allowances scaled by minimum capital requirement[1] (Ahmed et al., 1999); this is our proxy for capital management. The total assets scale all discretionary LLP's variables except for $CAPB_t$.

Our expectations regarding the signs of coefficients βi, δ_i, and γ_i are identical as those from Lobo and Yang (2001). We have no expectation for β_1 because the quality of incremental loans is not predictable. Current charge-offs provide an indication regarding future net charge-offs, and we predict a positive sign for β_2. The sign of β_3 is expected to be negative because LLA are expected to be used as an inventory in setting current LLP levels. Terms β_4 and β_5 are related to the level and the change in non-performing loans and are expected to be positive.

We expect a positive sign of δ_i for discretionary coefficients because if earnings before LLP and taxes are high, then banks should have an incentive to smooth their net earnings by increasing their level of LLP. In addition, a negative sign of γ_i is expected as Tier 1 capital or regulatory capital before loan loss provisions. This should be lower whether banks make provisions to increase loan loss allowances as a Tier 2 component.

Third, we test the hypothesis of discretionary management of capital for banks pertaining to different country clusters. These translate into differences in Day One impact (H3). We modified Lobo and Yang's model by adding specific IFRS 9 Day One impact's variables. The model is defined in Equation (2):

$$\begin{aligned} LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} \\ + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \mu_{1i}SOV_{it} + \mu_{2i}D1\_RE_{it} \\ + \mu_{3i}D1\_OTR_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

The coefficients noted μ_i are related to the sovereign rating and Day One impact's variables.

The 93 banks in our sample can be divided in two groups based on their obligation to comply with bank regulation: Commercial banks are subject to bank regulations set by BCBS, and supranational banks are not supervised by regulators. Commercial banks not only have to abide by the Basel capital ratio but also to the profitability objectives imposed by shareholders.

[1] Capital requirement represents the minimum level of Tier 1 capital to risk-weighted assets. From January 1st, 2016, banks are required to apply capital buffer in addition to minimum Tier 1 capital requirement. Capital buffer takes the values in percentage of risk-weighted assets of 0.625, 1.25, and 1.875 for 2016, 2017, and 2018, respectively. The total minimum Tier 1 capital requirements including capital buffer are, in percentage of risk-weighted assets: 4 (2012), 4.5 (2013), 5.5 (2014), 6 (2015), 6.625 (2016), 7.25 (2017), and 7.875 (2018).

In contrast, supranational banks do not need to comply with BCBS rules and have no profit-seeking objectives. Commercial banks were split into three sub-samples based on the credit rating of their country of operations: Aaa to Aa3; A1t o Baa3; and BB+ and below[2]. We assume that the rating of the country has an influence on the average rating of the loan book and hence on its expected loss (see hypothesis H1).

In H3, we hypothesized that banks that experience a decrease in capital should increase their LLP in accordance with capital management incentive. Thus, $D1\_RE_t$ and $D1\_OTR_t$ in Equation (2) transcribe the Day One impact. $D1\_RE_t$ is the Day One net impact on retained earnings and distributable reserves, and $D1\_OTR_t$ is the net impact on OCI and other reserves as transcribed on banks' statement of changes in shareholders' equity; both scaled by total assets. In accordance with the capital management hypothesis, we expect negative signs for both μ_{1i} and μ_{2i} but we restrict this expectation to banks based in countries with medium/high credit ratings and stable banking systems. These are facing favorable or limited impact.

Some banks based in weaker countries whose capital and earnings capacity have been markedly affected by the transition to IFRS 9. In these cases, we expect a positive sign for $D1\_RE_t$. These banks have limited capacity to absorb the cost of the transition to the IFRS 9. Consequently, we also expect a positive sign for $D1\_OTR_t$ regarding weak banks.

5. Results

5.1. Test of Hypothesis 1

Table 1 provides descriptive statistics of the gains (losses) relative to the adoption of IFRS on Day One relative to banks' shareholder equity. The data show that the adoption of IFRS 9 translated into a loss for the vast majority of banks (77 out of 92). The average effect was a loss of 3.666% of equity. The outcome distribution covers a fairly large range: The highest loss reaches 40.407%, and the largest gains is 3.177%. The loss was largely attributable to the re-measurement of assets, which led to an average increase in the LLA of 3.425% of shareholders' equity on Day One; the losses related to reclassifications were 0.162%.

LLPs relative to loans (Colum 5) did not increase in 2018. This might contradict the hypotheses and the pre-implementation studies at first view. However, this is attributable to the substantial number of loans that have been written-off by banks in 2018; this enabled banks to

[2] The Moody's rating scale was used. The equivalent on the Standard & Poor's and Fitch scales are: AAA to AA- ; A+ to BBB- ; and BB+ and below.

de-recognize the riskiest assets and hence reduce the provisioning requirements. Further evidence is provided in Tables 2 and 3.

Table 1. Gain (losses) related to adoption of IFRS 9 as a percentage of shareholders' equity at December 31st **2017.**

	Impact of IFRS 9 on retained earnings	Impact of IFRS 9 on other reserves	Impact of IFRS 9 on total equity	LLPs to loans in 2017	LLPs to loans in 2018
Number of observations	92	92	92	92	92
Mean (%)	–3.425	–0.162	–3.666	0.560	0.368
Median (%)	–1.327	–0.024	–1.680	0.218	0.195
Standard deviation (%)	6.336	1.481	6.056	0.954	0.577
Maximum (%)	2.863	7.232	3.177	5.316	3.292
Minimum (%)	–40.706	–5.069	–40.407	–0.940	–0.465
Number of neg. effects	14	36	11	76	76
Number of pos. effects	77	49	81	15	16
No effect	1	7	0	1	0

These findings are consistent with results from the pre-implementation studies and the first post-implementation tests conducted by banking authorities and auditing firms (see above), which all concluded that the transition to IFRS 9 would imply a moderate overall loss for banks. However, the magnitude of the range of outcomes was not anticipated: two banks recorded a loss of more than 20% of shareholders' equity (and one of more than 40%); 10 banks recorded a loss higher than 10%. No studies, to the best of our knowledge, have yet anticipated gains from the transitions: 11 institutions recorded a gain. More surprisingly, these gains did not always originate from the reclassification of assets: 14 institutions reported a gain on the measurement of assets, i.e. from lower LLAs on Day One. Gains from the IFRS 9 transitions did not exceed 3.18% of shareholders' equity.

Table 2. Average loan loss allowance as a percentage of total assets.

	Total	Loans	Securities	Off-balance sheet	Cost of risk	Write-offs
End-December 2017	2.72	2.72				
January 1st 2018	3.22	4.73	0.02	0.13		
31st December 2018	2.59	2.65	0.02	0.07		
Total 2018 change	–1.46	–1.53	–0.01	0.07	0.24	–1.70

As a result of the adoption of the new standard, the LLAs increased from 2.72% to 3.12% (of total assets). The increase in LLAs principally results from the upward readjustment of the LLA for loans under IFRS 9, which is due to the switch from incurred losses to expected

loss provisioning. The adoption of IFRS 9 leads to quasi doubling of the LLA on loans from 2.70% at December 31st 2017 to 4.73% on January 1st 2018. However, the effect of total LLAs is mitigated by on other elements (mainly asset write-offs) which explains why total LLAs are lower than LLAs for amortized cost assets (mainly loans).

Table 3 shows that the bulk of LLAs on loans on January 1st and December 31st 2018 originate from assets classified as Stage 3. This indicates that the inclusion in LLAs for the 12 months ECL on all loans and for the lifetime ECL on loans subject to an increase in credit risk only account for a small share of LLAs. The results also provide suggest that the decline in LLAs measured against total assets at 31st December 2018 was concentrated in Stage 3 assets. The asset write-offs in 2018 were concentrated on Stage 3 loans. In other words, the observed marked reduction in LLAs are surprising given that the expected increase in LLAs result from the adoption in IFRS 9: This fact is largely attributable to the banks' strategy of eliminating the riskiest assets from the balance sheet.

Table 3. Average Loss Allowance on Loans as a Percentage of Total Assets.

	Total	Stage 1	Stage 2	Stage 3
Loan loss reserve at December 31st 2017	2.72			
Total LLA at January 1st 2018	4,73	0,19	0,32	4,30
Total LLA at December 31st 2018	2,65	0,15	0,23	2,27
Variation 2018, as a % of total assets at end-2018	-1,53	-0,02	-0,06	-1,48

Hence, we conclude that the adoption of IFRS 9 has led to an increase in provisions on the day of its implementation. The IFRS 9 translates into a doubling in provisions based on a comparable asset portfolio. However, no conclusion can be drawn from the change in LLAs between January 1st and 31st December 2018 because of large asset write-offs.

The analysis by geographical location of the banks' head office provides evidence for the marked difference in Day One impact between countries. Table 4 shows the f8ve countries where banks recorded the highest gains (or lowest losses) from the transition to IFRS 9 on January 1st 2018 as well as the 5 countries where banks inversely reported the highest losses. Banks based in Greece, Italy, and Cyprus lost more than 10% (i.e. two times standard deviation) of shareholder's equity on the transition to IFRS 9; they were followed by banks based in Poland and Spain. Interestingly, these banks are based in countries that were particularly affected by the 2008 financial crisis—they have among the lowest sovereign credit ratings in the sample. In fact, Greece and Cyprus were temporarily downgraded to speculative grade; the average impaired loans ratio and the cost of risk are among the highest in the sample. This leads to the

conclusion that countries can be segregated into two categories: banks based in countries for which impact has remained in a 'normal' range and banks that have been significantly and negatively impacted by the transition to IFRS 9.

Table 4. Analysis by Country of Banks' Head Office: Day One Impact, LLA, and Cost of Risk

Country of Banks' Head Office	Day One gain (loss) on RE/ Equity (%) 01.01.18	Change in LLA, 2018 (%)	Cost of risk / Total assets in 2018 (%)	Impaired loans / Gross loans 2018 (%)	Sovereign Credit rating (Moody's)
Five Lowest Day One Effect					
Slovenia	2.80	–2.52	–0.23	8.28	Baa1
Iceland	0.42	–0.52	0.27	2.61	A3
Norway	–0.13	–0.15	0.00	1.73	Aaa
Denmark	–0.15	–0.07	0.00	1.45	Aaa
Finland	–0.23	–0.01	0.03	1.39	Aa1
Five Highest Day One Effect					
Spain	–3.63	–0.28	0.45	4.15	Baa1
Poland	–4.78	0.12	0.45	5.83	A2
Cyprus	–11.43	–8.83	1.31	35.65	Ba2
Italy	–11.88	–2.16	0.38	9.88	Baa3
Greece	–17.44	–5.50	1.26	44.27	B3

5.2. Test of Hypotheses 2 and 3

Descriptive statistics

The model of Lobo and Yang (2001) was used to test hypotheses 2 and 3. The descriptive statistics and correlation coefficients for commercial banks are described in Table 5 and Table 6, respectively.

Table 5. Descriptive Statistics for Commercial Banks (N = 560).

	Mean	*Std. Dev.*	*Min.*	*25%*	*Med.*	*75%*	*Max.*
LLP_t	0.618	1.040	–0.897	0.066	0.227	0.760	11.786
$\Delta LOAN_t$	–1.151	8.095	–35.575	–5.233	–1.237	2.559	30.895
$CHOFFS_t$	0.741	1.652	–6.505	0.086	0.287	0.871	18.929
LLA_{t-1}	3.458	4.318	0.033	0.598	1.746	4.385	24.521
NPL_{t-1}	6.448	8.320	0.014	1.297	3.186	7.936	49.545
ΔNPL_t	–0.251	2.911	–23.302	–0.593	–0.105	0.067	25.858
$EBLLPT_t$	0.956	0.745	–3.837	0.537	0.786	1.284	5.697
$CAPB_t$	2.652	1.435	–1.675	2.039	2.467	2.978	30.642
SOV_t	16.188	4.885	1	13	17.5	21	21
$D1\_RE_t$	–0.051	0.282	–3.353	0	0	0	0.418
$D1\_OTR_t$	–0.002	0.042	–0.410	0	0	0	0.484

Table 6. Correlation Matrix of Variables in Equation () for Commercial Banks (N = 560).

		(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
(1)	LLP_t	1.000									
(2)	$\Delta LOAN_t$	**–0.227**	1.000								
(3)	$CHOFFS_t$	**0.390**	**–0.535**	1.000							
(4)	LLA_{t-1}	**0.563**	**–0.282**	**0.620**	1.000						
(5)	NPL_{t-1}	**0.584**	**–0.253**	**0.516**	**0.958**	1.000					
(6)	ΔNPL_t	**0.192**	**0.357**	**–0.531**	**–0.260**	**–0.254**	1.000				
(7)	$EBLLPT_t$	0.001	**0.173**	–0.061	**0.173**	**0.145**	–0.033	1.000			
(8)	$CAPB_t$	**–0.090**	0.037	–0.080	**–0.108**	**–0.112**	–0.006	0.035	1.000		
(9)	SOV_t	**–0.591**	**0.124**	**–0.339**	**–0.741**	**–0.744**	–0.053	**–0.250**	**0.175**	1.000	
(10)	$D1\_RE_t$	–0.038	**0.145**	**–0.396**	**–0.332**	**–0.322**	**0.301**	–0.026	**0.094**	**0.196**	1.000
(11)	$D1\_OTR_t$	0.050	–0.017	**0.094**	**0.094**	**0.099**	–0.076	0.019	–0.012	**–0.114**	**–0.215**

Notes: Table 6 presents Pearson's correlation for 81 commercial banks over the period 2012-2018. LLP_t = Loan Loss Provisions; $\Delta LOAN_t$ = Change in Gross Loans; $CHOFFS_t$ = Loans Charged-offs; LLA_{t-1} = Lagged Loan Loss Allowance; NPL_{t-1} = Lagged Non-performing Loans; ΔNPL_t = Change in Non-performing Loans; $EBLLPT_t$ = Earnings before LLP and Income Taxes; $CAPB_t$ = Tier 1 Capital to minimum Capital Requirement; SOV_t = Sovereign Rating; $D1\_RE_t$ = Day One impact on Retained Earnings; $D1\_OTR_t$ = Day One impact on Other Reserves. All variables are scaled by total assets except $CAPB_t$ and SOV_t. Correlation's coefficients in bold denote a statistical significance at a level of 5%.

Pearson's correlations are presented in Table 6. Regarding non-discretionary variables, the NPL_{t-1} and ΔNPL_t are positively and significantly associated with LLP_t as predicted. Similar to Lobo and Yang (2001), we found a negative, significant, yet unexpected correlation for $\Delta LOAN_t$ and LLP_t. As previously noted, this negative correlation should denote an improvement in the quality of loans with improvements in the European economic environment on the aftermath of the financial crisis. Furthermore, the observed positive and significant correlation of $CHOFFS_t$ with LLP_t conforms to our expectations and is in contrast to the positive correlation of LLA_{t-1}, which contradicts our predictions. The discretionary variable $CAPB_t$ exhibits a negative and significant correlation with LLP_t consistent with the capital management hypothesis; $EBLLPT_t$ is positive but not significant. Regarding the impact of the implementation of IFRS 9, both $D1\_RE_t$ and $D1\_OTR_t$ are statistically insignificant while SOV_t is negative and significant: This suggests that banks in lower-rated countries set more provisions.

Test of Hypothesis 2

Income smoothing and capital management incentives. Incentives to manage LLP may vary among banks in terms of specificity and time. To test H2, we performed a year-by-year cross-sectional regressions of Equation (2). As reported by Lobo and Yang (2001), year-by-year analysis allows mitigating industry-wide factors to overpass the assumption of stationarity of parameters over time for each bank. Table 7 reports coefficients of OLS cross-sectional

regression of Equations (1) and (2) for each year. In the last column, we report the mean value of coefficients calculated from 2012 to 2018 and the related t-statistics into brackets. The calculation of the mean value of coefficients across the years includes coefficients from versions (2) to (8), and excludes version (1) where the Day One variables have been included.

Table 7. Year-by-year OLS Regression of Equation (2) with White's Robust Estimator for Commercial Banks.

$$LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \mu_{1i}SOV_{it} + \mu_{2i}D1\_RE_{it} + \mu_{3i}D1\_OTR_{it} + \varepsilon_{it}$$

		2018		2017	2016	2015	2014	2013	2012	Mean excl. (1)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Intercept	?	0.34	0.31	–0.13	0.82	0.01	1.39**	–0.42	1.37*	0.48
		(1.35)	(1.37)	(–0.27)	(1.42)	(0.03)	(2.16)	(–0.64)	(1.98)	(1.75)
$\Delta LOAN_t$	?	0.00	0.00	–0.03	0.01	0.00	–0.02	0.01	–0.04	–0.01
		(0.64)	(0.74)	(–1.35)	(0.77)	(0.41)	(–1.21)	(0.55)	(–1.35)	(–1.09)
$CHOFFS_t$	+	0.12**	0.12**	0.23	0.22	0.62***	0.51**	0.62***	0.22	0.36***
		(2.11)	(2.12)	(0.88)	(0.99)	(4.29)	(2.62)	(3.47)	(0.85)	(4.52)
LLA_{t-1}	–	–0.20***	–0.20***	0.12	–0.10	–0.15	–0.18	–0.24*	0.07	–0.10
		(–4.47)	(–4.52)	(0.91)	(–0.91)	(–1.55)	(–1.31)	(–1.77)	(0.80)	(–1.82)
NPL_{t-1}	+	0.13***	0.13***	–0.01	0.08	0.13***	0.09	0.21***	0.04	0.10**
		(5.22)	(5.23)	(–0.13)	(1.62)	(3.16)	(1.51)	(3.43)	(0.58)	(3.61)
ΔNPL_t	+	0.08**	0.08**	0.14*	0.11	0.41***	0.21***	0.22***	0.08*	0.18***
		(2.09)	(2.04)	(1.70)	(1.42)	(7.25)	(3.25)	(3.53)	(1.98)	(4.13)
$EBLLPT_t$	+	0.19**	0.19**	0.04	–0.10	0.16	0.15	–0.04	0.04	0.06
		(2.47)	(2.56)	(0.37)	(–0.73)	(1.24)	(1.26)	(–0.31)	(0.29)	(1.50)
$CAPB_t$	–	–0.14*	–0.13*	–0.21	–0.01	0.22***	–0.19*	0.17	–0.19*	–0.05
		(–1.93)	(–1.85)	(–1.65)	(–1.03)	(2.75)	(–1.92)	(1.49)	(–1.88)	(–0.72)
SOV_t	–	–0.01	–0.01	0.04	–0.03	–0.04	–0.05	–0.01	–0.03	–0.02
		(–0.63)	(–0.56)	(1.34)	(–1.19)	(–1.48)	(–1.64)	(–0.36)	(–1.13)	(–1.55)
$D1\_RE_t$	+	–0.04								
		(–0.30)								
$D1\_OTR_t$	+	–0.11								
		(–0.52)								
N		80	80	80	80	80	80	80	80	
Adj-R^2		76.79%	76.68%	70.25%	53.07%	86.31%	72.37%	83.42%	67.44%	
F		15.41	20.68	9.82	5.79	30.40	19.20	19.15	14.94	

Notes: Table 7 presents a year-by-year OLS regression of Equation (1) with White's heteroscedasticity-consistent estimator. The numbers in parentheses are t-statistics. LLP_t = Loan Loss Provisions; $\Delta LOAN_t$ = Change in Gross Loans; $CHOFFS_t$ = Loans Charged-offs; LLA_{t-1} = Lagged Loan Loss Allowance; NPL_{t-1} = Lagged Non-performing Loans; ΔNPL_t = Change in Non-performing Loans; $EBLLPT_t$ = Earnings before LLP and Income Taxes; $CAPB_t$ = Tier 1 Capital to minimum Capital Requirement; SOV_t = Sovereign Rating; $D1\_RE_t$ = Day One impact on Retained Earnings: $D1\_OTR_t$ = Day One impact on Other Reserves All variables are scaled by total assets except $CAPB_t$ and SOV_t. The *, ** , and *** denote a statistical significance at a level of 10%, 5%, and 1%, respectively.

The results denote heterogeneity in income smoothing and capital management incentives across the years as mean coefficients of $EBLLPT_t$. The $CAPB_t$ reported in the last column are statistically insignificant although their signs are conforming to our expectations. Nevertheless, these adverse results could be imputed to the characteristics of our sample consisting of banks from various countries. This is in contrast to banks differently affected by the not-too-distant financial crisis. By focusing on the year 2018, we find that both $EBLLPT_t$ and $CAPB_t$

coefficients are significant and conform to our expectations in versions (1) and (2) unlike previous years. These results support the hypotheses that banks use their discretionary power on LLP for income smoothing and capital management on the year 2018; these findings validate H2a and H2b. More interestingly, the statistical significance of both discretionary variables specific to 2018 should be used with the switch in 2018 to IFRS 9's ECL model from IAS 39's incurred loss model. These circumstances suggest an extent in banks' discretionary power in provisions; the calculation is imputable to ECL.

Test of Hypothesis 3

The coefficients in Equation (2) were estimated by a panel regression with fixed effects. WE used three steps to test H3. We first aim to capture opportunistic behavior from commercial banks by comparing them with supranational banks. Supranational banks are not submitted to regulatory compliance and follow different objectives in terms of income smoothing; thus, the coefficient of $D1\_RE_t$ should have a different sign than commercial banks and/or those with statistical insignificance (Table 8). We next classified banks into three subsamples related to their mean sovereign rating computed over 2012-2018: Aaa and Aa-rated, A and Baa-rated. and below Baa-rated. Whether the sovereign rating relies on Day One impact, we should find different signs for $D1\_RE_t$ according to their rating classification (Table 9). We performed a final classification via the value of $D1\_RE_t$ assuming that the banks with a lower sovereign rating faced the most unfavorable Day One impact as revealed in test of H1. To confirm our rating approach, we expected to find similar signs and more statistical significance for coefficients of $D1\_RE_t$ (Table 10). The results from panel regressions are presented in Tables 8, 9, and 10.

Commercial Vs. Supranational banks. Table 8 presents the results from panel regressions with fixed effects for commercial (80 banks over 7 years; 560 observations) and supranational banks (12 banks over 7 years; 84 observations). We did not assign values for SOV_t and $CAPB_t$ for supranational banks because as they are not submitted to regulatory compliance.

Coefficients of non-discretionary-related variables across subsamples conform our predictions—they are all significant for commercial banks. Not surprisingly, coefficients of $EBLLPT_t$ and $CAPB_t$ denote signs in contrast with our expectations. These denote non-stationary parameters over time for each bank as explained when H2 was tested. The signs of SOV_t and $D1\_RE_t$ conform to our expectations regarding IFRS 9-related variables.

Table 8. Panel Regression of Equation (2) with Fixed Effects
Breakdown by Bank Categories.

$$LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \mu_{1i}SOV_{it} + \mu_{2i}D1\_RE_{it} + \mu_{3i}D1\_OTR_{it} + \varepsilon_{it}$$

		Commercial Banks		**Supranational Banks**	
		Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)
Intercept	?	1.776***	1.486**	0.892***	0.979***
		(3.073)	(2.580)	(5.053)	(5.311)
$\Delta LOAN_t$	?	–0.017***	–0.015***	–0.010	–0.010
		(–4.104)	(–3.792)	(–1.042)	(–1.084)
$CHOFFS_t$	+	0.314***	0.335***	0.149**	0.130*
		(10.387)	(11.047)	(2.137)	(1.813)
LLA_{t-1}	–	–0.385***	–0.381***	–0.366***	–0.364***
		(–11.833)	(–11.889)	(–3.649)	(–3.634)
NPL_{t-1}	+	0.257***	0.255***	0.278***	0.273***
		(13.729)	(13.806)	(4.068)	(3.987)
ΔNPL_t	+	0.215***	0.206***	0.027	0.011
		(14.097)	(13.490)	(0.495)	(0.201)
$EBLLPT_t$	+	–0.258***	–0.269***	–0.353**	–0.388***
		(–4.007)	(–4.241)	(–2.664)	(–2.904)
$CAPB_t$	–	0.015	0.012		
		(0.731)	(0.612)		
SOV_t	–	–0.091***	–0.072**		
		(–2.622)	(–2.063)		
$D1\_RE_t$	+		0.411***		0.168
			(3.959)		(0.695)
$D1\_OTR_t$	+		0.699		–1.463
			(1.116)		(–1.206)
N		560	560	84	84
Overall R^2		56.46%	55.34%	9.68%	8.45%
F		49.89	58.65	8.12	6.49
Sign of $D1\_RE_t$ at 01.01.2018:					
N			80		12
N = Positive			10		4
N = Nul			0		1
N = Negative			70		7
Value of $D1\_RE_t$ at 01.01.2018:					
Min.			–3.353		–2.419
Mean			–0.356		–0.333
Med.			–0.094		–0.071
Max.			0.418		0.412

Notes: Table 8 presents fixed-effects panel regression of Equation (2) broken-down by bank category. LLP_t = Loan Loss Provisions; $\Delta LOAN_t$ = Change in Gross Loans; $CHOFFS_t$ = Loans Charged-offs; LLA_{t-1} = Lagged Loan Loss Allowance; NPL_{t-1} = Lagged Non-performing Loans; ΔNPL_t = Change in Non-performing Loans; $EBLLPT_t$ = Earnings before LLP and Income Taxes; $CAPB_t$ = Tier 1 Capital to minimum Capital Requirement; SOV_t = Sovereign Rating; $D1\_RE_t$ = Day One impact on Retained Earnings: $D1\_OTR_t$ = Day One impact on Other Reserves. All variables are scaled by total assets, except $CAPB_t$ and SOV_t. The *, **, and *** denote a statistical significance at a level of 10%, 5%, and 1%, respectively.

Assuming that the loan portfolio quality is correlated with sovereign rating, banks for which sovereign rating is low provision more. As expected, a favorable Day One impact on retained

earnings and distributable reserves allows commercial banks to specifically set more provisions; the coefficient of $D1\_RE_t$ is insignificant for supranational banks. Finally, the Day One impact on other capital reserves has no significant impact on loan loss provisions for other commercial and supranational banks.

Classification by sovereign rating. Table 9 presents the regression coefficients for commercial banks only. We dichotomize our sample into three subsamples related to mean sovereign ratings from 2012 to 2018 computed on an annual basis according the value assigned to each rating[3]. The first set shows coefficients of banks for which sovereign rating is either Aaa or Aa on Moody's rating scale (40 banks on 7 years; 280 observations). The second set denotes countries rated either A or Baa (30 banks on 7 years; 210 observations), and the last includes countries with a sovereign rating below Baa (11 banks on 7 years; 77 observations).

Table 9 conforms to our expectations for non-discretionary variables for banks in Aaa & Aa and A & Baa categories. In these two categories, coefficients of discretionary variables are insignificant and/or present an unexpected sign. More surprisingly, the results show the insignificance of non-discretionary variables for banks belonging to < Baa category except for LLA_{t-1}. This result is surprising because the loan loss provisions for these banks are unrelated to non-discretionary components. In addition, there is no significant association with discretionary components.

By focusing on Day One-related variables, we observe different signs of D1_REt among mean sovereign rating categories. The D1_REt is negative but not significant for banks ranging to Aaa from Baa. We note seven positive values of impact on retained earnings with a mean value of –0.051 in the Aaa & Aa category; the maximum value is 0.112%. There were three positive values of impact on retained earnings for the A & Baa category and the highest maximal value is 0.418%. The coefficient of D1_OTRt is insignificant for both Aaa & Aa and A & Baa categories. In contrast, we note positive and significant coefficients for both D1_REt and D1_OTRt as well as for banks whose mean sovereign rating is below Baa supporting our hypothesis that banks operating in weaker countries made provisions when the Day One impact is more favorable.

[3] Rating scale and assigned values are available in Appendix at the end of the paper.

Table 9. Panel Regression of Equation (2) with Fixed Effects for Commercial Banks Breakdown by Banks' Mean Country Sovereign Rating Computed Over 2012-2018.

$$LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \mu_{1i}SOV_{it} + \mu_{2i}D1\_RE_{it} + \mu_{3i}D1\_OTR_{it} + \varepsilon_{it}$$

		Aaa & Aa		A & Baa		< Baa	
		Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)
Intercept	?	–0.739	–0.708	3.360***	2.987***	2.478**	1.104
		(–1.569)	(–1.481)	(3.345)	(2.851)	(2.513)	(1.172)
$\Delta LOAN_t$	?	–0.005***	–0.005***	–0.020***	–0.021***	–0.035**	–0.028*
		(–3.216)	(–3.232)	(–2.981)	(–3.149)	(–2.028)	(–1.776)
$CHOFFS_t$	+	0.211***	0.209***	0.508***	0.510***	0.016	0.151*
		(3.824)	(3.766)	(11.624)	(11.660)	(0.177)	(1.736)
LLA_{t-1}	–	–0.203***	–0.205***	–0.506***	–0.508***	–0.093	–0.172**
		(–3.522)	(–3.526)	(–9.216)	(–9.221)	(–1.180)	(–2.344)
NPL_{t-1}	+	0.222***	0.220***	0.324***	0.329***	0.040	0.072
		(8.081)	(7.801)	(10.605)	(10.675)	(0.804)	(1.565)
ΔNPL_t	+	0.238***	0.237***	0.329***	0.344***	0.046	0.053
		(12.382)	(12.117)	(13.901)	(13.143)	(1.086)	(1.387)
$EBLLPT_t$	+	–0.073	–0.076*	–0.155	–0.135	0.101	0.109
		(–1.616)	(–1.659)	(–1.638)	(–1.399)	(0.539)	(0.651)
$CAPB_t$	–	0.002	0.002	–0.124	–0.114	0.043	–0.005
		(0.538)	(0.501)	(–1.279)	(–1.171)	(0.306)	(–0.039)
SOV_t	–	0.036	0.035	–0.209***	–0.189***	–0.133	0.080
		(1.535)	(1.471)	(–3.311)	(–2.884)	(–1.368)	(0.797)
$D1\_RE_t$	+		–0.004		–0.251		0.943***
			(–0.017)		(–1.221)		(4.049)
$D1\_OTR_t$	+		0.129		0.146		8.365**
			(0.608)		(0.137)		(2.148)
N		280	280	210	210	77	77
Overall R^2		49.80%	49.44%	49.47%	49.80%	34.91%	5.73%
F		32.46	25.83	63.09	50.59	1.73	3.43
Sign of $D1\_RE_t$ at 01.01.2018:							
N			40		30		11
N = Positive			7		3		0
N = Null			0		0		0
N = Negative			33		27		11
Value of $D1\_RE_t$ at 01.01.2018:							
Min.			–0.415		–2.331		–3.353
Mean			–0.051		–0.452		–1.204
Med.			–0.044		–0.268		–0.676
Max.			0.112		0.418		–0.001

Notes: Table 9 presents fixed-effects panel regression of Equation (2) broken-down by mean sovereign rating computed over 2012-2018. LLP_t = Loan Loss Provisions; $\Delta LOAN_t$ = Change in Gross Loans; $CHOFFS_t$ = Loans Charged-offs; LLA_{t-1} = Lagged Loan Loss Allowance; NPL_{t-1} = Lagged Non-performing Loans; ΔNPL_t = Change in Non-performing Loans; $EBLLPT_t$ = Earnings before LLP and Income Taxes; $CAPB_t$ = Tier 1 Capital to minimum capital requirement; SOV_t = Sovereign Rating; $D1\_RE_t$ = Day One impact on retained earnings: $D1\_OTR_t$ = Day One impact on other reserves. All variables are scaled by total assets except for $CAPB_t$ and SOV_t. Terms *, **, and *** denote a statistical significance at 10%, 5%, and 1%, respectively.

Classification by Day One impact on retained earnings. Table 10 presents the regression coefficients for commercial banks dichotomized into three subsamples related to impact on

retained earnings. We classify banks into thirds according their impact on retained earnings. The first set denotes the first third: The unfavorable impact has been limited or positive. The second set presents banks belonging the second third, and the last set includes banks with a highly unfavorable impact. We expect to find similar associations between LLP_t and $D1\_RE_t$ than in Table 9 because banks with a lower sovereign rating are the most unfavorably impacted by Day One.

Table 10 shows an expected and significant sign of coefficients for almost all non-discretionary components for each category; these are insignificant and/or contradict with our prediction for discretionary components. By focusing on $D1\_RE_t$, we find different and significant signs according to thirds. In the 1st third, banks faced favorable or limited impact. The $D1\_RE_t$ is negative and significantly associated with loan loss provisions. In contrast, $D1\_RE_t$ is positive and significant for banks that suffered stronger unfavorable impact clustered in the 3rd third. This was not significant for the 2nd third. No significant association for $D1\_OTR_t$ was observed for any category.

Discussion. Tables 8, 9, and 10 demonstrate that the level of loan loss provisions is commensurate with the Day One losses on retained earnings and distributable reserves. The level of LLP at the end of the year is higher when the Day One loss is higher—this is seen in commercial banks and in contrast to supranational banks. More precisely, banks with a mean sovereign rating from 2012to 2018 below Baa (Cyprus, Croatia, Greece, Hungary and Portugal) are willing to provision more to compensate for this decrease in capital. More generally, banks that faced larger Day One losses on retained earnings are mostly in weaker countries as explained in H1. This increased their LLP commensurate to their losses. In most cases, banks from stronger countries that experienced limited losses have not increased their LLP. They even decreased their LLP when the Day One impact was favorable supporting H3.

Table 10. Panel Regression of Equation (2) with Fixed Effects for Commercial Banks Breakdown by Banks' Day One Impact on Retained Earnings-To-Assets.

$$LLP_{it} = \beta_{0i} + \beta_{1i}\Delta LOAN_{it} + \beta_{2i}CHOFFS_{it} + \beta_{3i}LLA_{it-1} + \beta_{4i}NPL_{it-1} + \beta_{5i}\Delta NPL_{it} + \delta_i EBLLPT_{it} + \gamma_i CAPB_{it} + \mu_{1i}SOV_{it} + \mu_{2i}D1\_RE_{it} + \mu_{3i}D1\_OTR_{it} + \varepsilon_{it}$$

		1st Third		2nd Third		3rd Third	
		Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)	Coeff. (t-stat.)
Intercept	?	0.518	0.935	1.569***	1.503***	2.574***	2.184**
		(0.546)	(1.039)	(3.803)	(3.533)	(2.976)	(2.518)
$\Delta LOAN_t$	?	–0.005	–0.005	–0.009***	–0.009***	–0.026***	–0.024***
		(–0.879)	(–1.025)	(–4.159)	(–3.917)	(–3.359)	(–3.049)
$CHOFFS_t$	+	0.757***	0.800***	0.380***	0.392***	0.075	0.103*
		(17.261)	(19.188)	(8.197)	(7.953)	(1.377)	(1.879)
LLA_{t-1}	–	–0.531***	–0.618***	–0.363***	–0.367***	–0.170***	–0.172***
		(–10.032)	(–11.806)	(–8.261)	(–8.259)	(–2.880)	(–2.955)
NPL_{t-1}	+	0.338***	0.311***	0.267***	0.272***	0.119***	0.119***
		(14.477)	(13.842)	(10.898)	(10.516)	(3.323)	(3.354)
ΔNPL_t	+	0.323***	0.284***	0.254***	0.258***	0.113***	0.106***
		(10.502)	(9.462)	(16.136)	(15.115)	(4.218)	(3.919)
$EBLLPT_t$	+	0.031	0.031	–0.019	–0.020	–0.150	–0.179
		(0.380)	(0.405)	(–0.444)	(–0.463)	(–1.109)	(–1.337)
$CAPB_t$	–	–0.006	–0.004	0.065***	0.069***	0.026	0.018
		(–0.424)	(–0.280)	(3.111)	(3.198)	(0.264)	(0.189)
SOV_t	–	–0.032	–0.042	–0.096***	–0.094***	–0.148**	–0.109
		(–0.661)	(–0.927)	(–4.239)	(–4.054)	(–2.274)	(–1.649)
$D1\_RE_t$	+		–4.022***		–0.214		0.412***
			(–5.079)		(–0.760)		(2.666)
$D1\_OTR_t$	+		–0.533		–0.053		1.432
			(–0.801)		(–0.221)		(0.836)
N		189	189	182	182	189	189
Overall R^2		84.90%	77.84%	61.05%	61.51%	40.49%	41.29%
F		134.68	127.07	57.81	45.89	6.80	6.33
Sign of $D1\_RE_t$ at 01.01.2018:							
N			27		26		27
N = Positive			10		0		0
N = Null			0		0		0
N = Negative			17		26		27
Value of $D1\_RE_t$ at 01.01.2018:							
Min.			–0.046		–0.230		–3.353
Mean			0.034		–0.108		–0.984
Med.			–0.007		–0.094		–0.546
Max.			0.418		–0.049		–0.230

Notes: Table 10 presents fixed-effects panel regression of Equation (2) broken-down by day-one impact on retained earnings. LLP_t = Loan Loss Provisions; $\Delta LOAN_t$ = Change in Gross Loans; $CHOFFS_t$ = Loans Charged-offs; LLA_{t-1} = Lagged Loan Loss Allowance; NPL_{t-1} = Lagged Non-performing Loans; ΔNPL_t = Change in Non-performing Loans; $EBLLPT_t$ = Earnings before LLP and Income Taxes; $CAPB_t$ = Tier 1 Capital to minimum Capital Requirement; SOV_t = Sovereign Rating; $D1\_RE_t$ = Day One impact on Retained Earnings: $D1\_OTR_t$ = Day One impact on Other Reserves. All variables are scaled by total assets except $CAPB_t$ and SOV_t. Terms *, **, and *** denote a statistical significance at a level of 10%, 5%, and 1%, respectively.

6. Conclusions

This research constitutes one of the first post-implementation tests of the adoption of IFRS 9. It is the first, at the time of the submission, to cover banks based in a large number of countries. The results show that the introduction of IFRS 9 has overall translated into losses for banks on the day of the adoption: The magnitude of the impact has been manageable for most banks. This is consistent with the initial post implementation tests conducted by banking authorities and auditing firms.

Our research found significant differences between banks and emphasizes the importance of the country factor. This constitutes the main original finding of our work. The negative effect of the adoption of IFRS 9 has been higher for banks based in countries most affected by the financial crisis. This effect can be explained by the weakness of the banking systems in these countries and the effect of the low credit ratings assigned to sovereigns. Hence, the impact on the banks' borrowers might explain the high level of provisions requirement under IFRS 9. This question needs to be clarified in future research.

The tests show that banks have maintained their opportunistic behavior after the introduction of IFRS 9. The evidence that LLPs reported under IFRS 9 are used to smooth earnings and manage capital was provided by our tests. However, the strategies that banks follow differ across countries. Banks in weak countries opted to maintain the level of their capital—and thus the short-term benefit of shareholders—rather than engaging in capital management strategies that would affect earnings. In contrast, banks based in healthy countries have continued to use provisioning to manage their capital despite the effect of the transition to Day One. These findings need to be confirmed in future studies.

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Appendix

Definition of Variables

Variables		*Definitions*	*Sources*
LLPit	=	Loan loss provisions scaled by total assets	Bureau Van Dijk's BankFocus
$\Delta LOAN_t$	=	Change in total gross loans	Bureau Van Dijk's BankFocus
$CHOFFS_t$	=	Net charge-offs computed as total LLA_{t-1} and LLP_t minus total LLA_t	Bureau Van Dijk's BankFocus
LLA_{t-1}	=	Total loan loss allowance	Bureau Van Dijk's BankFocus
NPL_{t-1}	=	Non-performing loans	Bureau Van Dijk's BankFocus
ΔNPL_t	=	Change in non-performing loans	Bureau Van Dijk's BankFocus
$EBLLPT_t$	=	Earnings before LLP and taxes	Bureau Van Dijk's BankFocus
$CAPB_t$	=	Tier 1 capital to minimum capital requirement	Bureau Van Dijk's BankFocus
SOV_t	=	Sovereign rating according rating scale (Aaa = 21 to C = 1)	Moody's
$D1\_RE_t$	=	Day One impact on retained earnings and distributable reserves	Annual financial reports
$D1\_OTR_t$	=	Day One impact on OCI and other reserves	Annual financial reports

Rating Scales and Assigned Values

	Moody's	Fitch Rating	Standard & Poor's	Assigned Values
Investment grade	Aaa	AAA	AAA	21
	Aa1	AA+	AA+	20
	Aa2	AA	AA	19
	Aa3	AA–	AA–	18
	A1	A+	A+	17
	A2	A	A	16
	A3	A–	A–	15
	Baa1	BBB+	BBB+	14
	Baa2	BBB	BBB	13
	Baa3	BBB–	BBB–	12
Speculative grade	Ba1	BB+	BB+	11
	Ba2	BB	BB	10
	Ba3	BB–	BB–	9
	B1	B+	B+	8
	B2	B	B	7
	B3	B–	B–	6
	Caa1	CCC+	CCC+	5
	Caa2	CCC	CCC	4
	Caa3	CCC–	CCC–	3
	Ca	CC	CC	2
	C	C, RD, D	C, D	1

[1] *Loan loss provisions* (LLP) is the term used by bank regulators while the term *impairment allowances* is retained by accounting standard setters. In this article, we use the term "loan loss provisions" to refer to periodical

provisions recognized for impairment of loans or other financial assets associated with credit losses; the loss allowance (LLA) for the accumulated LLPs are at a given date (year-end or half-year).

[2] See Basel III regulatory framework, Basel Committee on Banking Supervision (BCBS, 2011).

[3] The definition of impaired loans under IFRS 9 remains broadly unchanged compared to IAS 39.

4 See CRR Art. 473a.

[5] Under the SA, collective provisions can be eligible as Tier 2 capital up to a limit of 1.25% of RWA. In the IRB approach, if accounting provisions are higher than prudential provisions, the difference can be reintegrated in Tier 2 capital.

[6] For further explanations and example, we refer to Deloitte (2016) *A Drain on Resources? The Impact of IFRS 9 on Banking Sector Regulatory Capital*. Available at:
https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/financial-services/ch-en-fs-impact-of-ifrs-9-on-banking-sector-regulatory-capital.pdf

7 The master thesis of Sy (2017) was the only academic paper, to our knowledge, proposing a pre-implementation of IFRS 9 standard. It led to the same conclusions that BNP Paribas and EBA.

[8] Main divergences concern the threshold for significant increase in credit risk (which determines whether an asset should be classified in Stage 2 or 3), the definition of macro-economic scenarios and the application of sensitivity analysis.

[9] This work focuses on capital as reported on the balance sheet and not on regulatory capital. While the information disclosed in the 2018 annual reports is sufficient to assess the effect on shareholders' equity, it does not provide enough details to measure the effect on regulatory capital.