Switching From Incurred to Expected Loan Loss Provisioning: Early Evidence

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May 2020

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Abstract

This paper provides early evidence on the effect of global regulation mandating a switch from loan loss provisioning (LLP) based on *incurred* credit losses (ICL) to LLP based on *expected* credit losses (ECL). Using a sample of systemically important banks from 74 countries, we find that ECL provisions are more predictive of future bank risk than ICL provisions. To corroborate that the switch to ECL provisioning results in more information to assess bank risk, we analyze the market reaction to disclosures on the first-time impact of the accounting change; we find that a higher impact on loan loss allowances elicits lower stock returns, higher changes in CDS spreads, and higher changes in bid-ask spreads. Critically, these patterns are most pronounced when credit conditions deteriorate. Finally, we also find evidence that, as credit conditions worsen, the rule change induces an increase in provisions and a contraction of credit. Our study contributes to the debate on the effect of the ECL model on procyclicality, an especially pressing issue in the context of the current pandemic.

Keywords: Expected credit losses, loan loss provision, bank accounting, IFRS 9.

JEL Classifications: M41, G21.

1. Introduction

The 2007-2008 financial crisis generated the perception that the accounting for loan losses in force at that time exacerbated procyclicality by providing "too little, too late" provisioning (e.g., Gaston and Song, 2014; Bischof, Laux, and Leuz, 2019).[1] As a consequence of this view, the traditional approach to measure impairment allowances based on *incurred* credit losses (ICL) is being gradually replaced by the alternative approach of building provisions based on *expected* credit losses (ECL). The new approach has been embraced by IASB in the new standard IFRS 9, which is currently being implemented around the world (the standard has been enforced for the first time in the financial statements corresponding to fiscal year 2018). In the US, FASB has also adopted an ECL approach in the Accounting Standards Update (ASU) 2016-13, Financial Instruments — Credit Losses (Topic 326), which is mandatory for the financial statements filed in 2020.[2] This paper provides early evidence on the effect of implementing the ECL approach on the information content of loan loss provisions.

Prominent regulators such as the European Banking Authority (EBA) consider the switch from ICL to ECL provisioning to be a significant change for banking entities, not only in terms of modelling and the use of new processes to estimate loan loss provisioning, but

[1] More specifically, the argument runs as follows. At the beginning of the crisis, the provisioned amounts (loan loss allowances) under the incurred loss model were not sufficient to face the downturn. As such, banks had to create additional provisions, which resulted in lower earnings (provisions are expensed in the profit and loss account) just at the time when the entities could not recognize the interest income from non-performing loans. The resulting decrease in income reduced the banks' regulatory capital during the economic downturn, leading to severe funding and capital pressures, and eventually forcing many banks to deleverage. A number of banks did so by selling non-core business lines and reducing the amount of risk-weighted assets (RWA). The reduction of RWA was done to a large extent by restricting new lending, thereby generating negative externalities.

[2] While both IFRS 9 and ASU 2016-13 are based on the ECL approach (i.e., provisioning based on expected - rather than incurred- credit losses), the US standard generally refers to the ECL approach using the term "Current Expected Credit Loss" (CECL).

also in terms of internal controls and reporting (EBA, 2018).[3] Yet, the implementation of ECL provisioning faces significant challenges. To begin, embedding forward-looking risk assessments in the measurement of the value of assets is not an easy task. The ECL approach entails a non-trivial data collection effort and requires expertise in the implementation of sophisticated risk modelling. This is especially important considering the limitations of risk modelling uncovered by the 2007-2008 financial crisis. Another difficulty is that, compared to the ICL approach, the ECL approach requires a higher degree of managerial judgment and discretion in the modelling process. While this is not necessarily a problem (reporting discretion could result in richer information for the users of financial statements), a higher reliance on managerial judgment allows more room for manipulation (ESRB, 2017).

Studying whether the switch from ICL to ECL provisioning affects the information content of loan loss provisions (LLP) is a necessary first step to understanding the economic consequences of the rule change. For example, finding that the switch from ICL to ECL is meaningless from an informational perspective would cast doubt on whether/how the new rule contributes to financial stability. While LLP is not the only accrual potentially relevant for prudential regulation, this provision drives much of the variability in banks' accruals (Beatty and Liao, 2014). This is not surprising considering that LLP are the largest accruals in banks' financial statements (loans often add up to more than 50% of banks' assets). The regulatory relevance of LLP reporting is also highlighted by the post-crisis debate on whether to include LLP in regulatory capital (advocates argued that letting loan loss reserves count

[3] This view is also shared by other prominent institutions. For example, in a report issued in 2016, the Global Public Policy Committee (which represents the six largest accounting networks), states: "For many banks, the adoption of expected credit loss accounting will be the most momentous accounting change they have experienced, even more significant than their transition to IFRS" (see https://www2.deloitte.com/bd/en/pages/financial-services/articles/2016-gppc-the-implementation-of-ifrs9-impairment-requirements-by-banks.html).

would encourage banks to report adequate and timely reserves, whereas opponents were concerned about a decline in the quality of regulatory capital).[4]

We study the informational effects of implementing the ECL approach to loan loss provisioning by exploiting the recent worldwide implementation of IFRS 9. Using a comprehensive sample of systemically important banks from around the world, we first collect information on the implementation dates in each country where IFRS is mandatory. The control group in our tests includes not only banks in countries where IFRS is not mandatory, but also banks in countries where IFRS 9 has yet to be implemented.

In our first set of tests, we find that LLP amounts reported under IFRS 9 are more predictive of subsequent risk (measured as forward stock return volatility, average absolute value of returns, and tail risk). This result is strong in countries experiencing deterioration in credit conditions (as measured by the spreads of sovereign CDS). However, we find little difference between the informativeness of LLP amounts reported under ECL and those reported under ICL when the country's credit conditions remain relatively unchanged. Consistent with enforcement playing an important role in IFRS 9 implementation, we also find that these patterns are more pronounced in countries with more intense banking supervision.

We contemplate the possibility that our results are driven by reporting discretion on LLP amounts (banks often use such discretion to manage earnings or to meet regulatory capital requirements). Using a variety of alternative measures of LLP reporting incentives from extant literature, we find –in consistency with our prior tests– that the effect of IFRS 9 on LLP reporting discretion critically depends on the country's economic conditions. When the country experiences adverse credit conditions, we find some evidence of a decrease (rather than an increase) in LLP reporting discretion. One possible explanation is that, when

[4] See Ng and Roychowdhury (2014) for a detailed discussion on this debate. Based on their evidence, these authors conclude that the ability to add back loan loss reserves to regulatory capital creates the illusion of non-declining financial health, which allows banks to avoid taking the actions necessary to reduce the risk of failure.

credit conditions deteriorate, the ECL model forces banks to incorporate bad news into reserves, whereas the ICL model provides managers with the option of not increasing provisions as long as the loss does not materialize (i.e., under ICL the bank has the discretion to increase provisions or not).[5] In contrast, we find the opposite (although weak) result when the economic conditions are relatively benign. This suggests that it is plausible that, without an obligation to incorporate bad news into reserves, IFRS 9 provides more opportunities for earnings/capital management than IAS 39 because –in contrast to IAS 39– IFRS 9 requires managerial judgment in the estimation of forward-looking losses.

To sharpen identification, we exploit the fact that, in the first year of implementation of IFRS 9, banks were required to disclose the "day-one impact of IFRS 9", namely the difference between provisions estimated under IFRS 9 and those same provisions under IAS 39. This offers a unique opportunity to analyze the differential effect of the two disclosure regimes, as the "day-one impact of IFRS 9" measures the difference between two estimates of the same underlying economic construct. We find that the day-one impact of IFRS 9 is negatively associated with short-window stock returns around the reporting date. In contrast, the difference is positively associated with short-window changes in CDS spreads around the reporting date. Consistent with our prior tests, we observe that the documented stock and debt market reactions are significant only in countries experiencing deterioration in credit conditions.

Finally, we test the effect of IFRS 9 on the level of provisioning and credit for our sample of banks. We find that, when credit conditions in the country deteriorate, the introduction of IFRS 9 results in an increase in loan loss allowances and a decrease in the amount of loans outstanding.

[5] The notion that ICL provided substantial discretion in LLP reporting is supported by prior literature documenting that, under the ICL regime, many banks around the world delayed provisioning for bad loans (e.g., Laeven and Majnoni, 2003).

Our paper is closely related to the stream of empirical research analyzing the relation between LLP and cyclicality. Laeven and Majnoni (2003)'s evidence suggests that many banks around the world delay provisioning for bad loans, thereby magnifying the impact of the economic cycle on banks' income and capital. Also consistent with a relation between LLP and cyclicality, Beatty and Liao (2011), and Bushman and Williams (2012, 2015) find that banks that record timely LLP make good risk management decisions that reduce procyclicality.[6] We add to this literature by examining the effect of a major rule change in LLP reporting: the introduction of the ECL model to estimate LLP (the accounting regime studied by prior papers imposed the use of the ICL approach). This regulatory change also offers a unique opportunity to corroborate that the patterns documented in prior work reflect a causal effect of loan loss provisioning on managerial decision making (rather than merely reflecting better management recording timelier provisions while dealing with risks more cautiously).

More specifically, our study contributes to recent literature on the ECL model. Harris, Kahn, and Nissim (2018) and Lu and Nikolaev (2019) develop models for estimating expected credit losses using publicly available information. Beatty and Liao (2020) show that, compared to reported provisions under the ICL model, analyst provision forecasts have incremental predictive power for future non-performing loans. Their results suggest that the ICL model imposes constraints that prevent banks from fully incorporating information about future losses, which is consistent with our evidence that the introduction of the ECL model increases the informativeness of reported provisions. Gaffney and McCann (2018), Ertan

[6] Using a time-series model to capture the timeliness of provisions, Beatty and Liao (2011) find that banks that tend to delay recognition of loan losses are more likely to cut lending in recessionary periods, thereby leading to higher lending pro-cyclicality. Bushman and Williams (2012) measure cross-country variation in accounting discretion related to the forward-looking nature of provisions by regressing LLP on future changes in non-performing loans. They find that forward-looking provisions designed to smooth earnings dampen discipline over risk taking. In contrast, they also find that forward-looking provisions designed to reflect timely recognition of future losses are associated with enhanced discipline. Finally, Bushman and Williams (2015) study whether delayed expected loan loss recognition is associated with greater vulnerability of banks.

(2019), and Löw, Schmidt, and Thiel (2019) provide evidence consistent with the ECL model inducing an increase in provisions and a decrease in credit. Our study extends this research by examining the informational effects of the ECL model, by analyzing systematically important banks around the world (the evidence in these prior studies is restricted to European banks), and by showing that the effect of the ECL model is significantly more pronounced during economic downturns.

Other recent research in banking studies the effect of the ECL model on procyclicality from a theoretical perspective, with the support of simulation techniques. Abad and Suarez (2018) show that the ECL model increases more suddenly the level of provisions than the ICL model when the economy switches from expansion to contraction. In turn, regulatory capital declines more severely at the beginning of the downturn. Buesa, Población, and Tarancón (2019) find that IFRS 9 is less procyclical than IAS 39, but more procyclical than ASU 2016-13. In contrast to these papers, our research is conducted right after the implementation of IFRS 9, which enables us to analyze actual data produced under the new rules.[7] We also add to this literature by providing early evidence that, under adverse credit conditions, IFRS 9 results in higher level of provisioning and lower level of loans outstanding (i.e., less credit) than IAS 39.

The need to understand the effect of the ECL model on procyclicality has become even more urgent in the midst of the current pandemic. In particular, the wake of the COVID-19 outbreak has raised the concern that IFRS 9 (and ASU 2016-13 in the US) could exacerbate the economic crisis. As explained by Abad and Suarez (2018), while usually inducing less procyclicality than the ICL model, the ECL could have a procyclical effect when the economic downturn is extremely sudden and severe, namely in situations such as the COVID-19 crisis (see also Borio and Restoy, 2020). This concern has elicited significant

[7] The simulated effect of IFRS 9 found by prior literature could be different from the actual effect because, among other things, LLP estimations are subject to measurement error (due to the difficulty in estimating expected losses) and/or to managerial reporting discretion.

responses by bank supervisors.[8] Our results are consistent with the notion that the ECL model can exacerbate the current crisis; we find that the effect of the ECL model becomes first-order in situations of adverse credit conditions. As shown in Figure 1, our measure of credit conditions –changes in CDS spreads of sovereign bonds– is highly correlated with the number of COVID-19 infections in the country (see also Online Appendix OA for a more formal analysis).

Our research also builds on prior accounting literature studying the information content of banks' LLP. This research is intertwined with the study of banks' motives to exercise discretion in LLP reporting, notably earnings management, regulatory capital management, and tax management (e.g., Beatty and Liao, 2014). As explained by Ryan (2011) and Beatty and Liao (2014), Beaver et al. (1989) embarked on this literature by documenting a positive association between market value and loan loss reserves. Beaver et al. (1989) provided an interpretation of this finding using a signaling argument: by reporting higher LLP, managers convey to the market that the bank's earnings power can withstand the negative impact of LLP on earnings. Other subsequent papers offer a similar interpretation: a higher LLP is a signal of the bank's intention and ability to resolve bad debt situations (Elliot, Hanna, and Shaw, 1991; Griffin and Wallach, 1991).[9] However, using different tests, Ahmed, Takeda, and Thomas (1999) find that LLP is negatively related to stock returns, calling into question the signaling explanation and arguing that discretion on LLP is driven by an effort to meet regulatory capital requirements rather than by financial reporting incentives (see also Collins, Shackelford, and Wahlen, 1995).[10] More recent papers have uncovered new

[8] See section 2.3 and Online Appendix OD for more details.

[9] Other papers in this literature include Wahlen (1994)'s, which points out the importance of controlling for NPLs and charge-offs, Liu and Ryan (1995)'s, which highlights the importance of loan type, and Beaver and Engel (1996)'s, which shows the importance of distinguishing between discretionary versus non-discretionary LLP. Liu, Ryan, and Wahlen (1997) find that positive association between loan loss provision and bank stock returns is only obtained by banks with low regulatory capital in the fourth fiscal quarter.

[10] In their analysis of this literature, both Ryan (2011) and Beatty and Liao (2014) rationalize these mixed results by arguing that the determinants of LLP reporting and its capital-market effects are nuanced and depend on a number of factors, on which these authors call for more research. Earlier studies uncovered some of them:

dimensions of LLP reporting, including sentiment in the estimation (Hribar et al., 2017), tax incentives (Andries, Gallemore, and Jacob, 2017), the interaction between bank regulators and external auditors (Nicoletti, 2018), and bank competition (Tommy, 2019).

We add to this research in two ways. First, we examine a major and unprecedented change in the rules used to measure LLP; the switch from ICL to ECL provisioning. We take a first step in this direction by analyzing the effect of this change on the informational content of LLP. Second, our paper also adds to prior research on the capital-market effects of LLP information in that, in contrast to the previous focus on the equity market, we examine the effect of this information on the debt market using CDS spreads.

Furthermore, our study adds to the literature examining the risk relevance of the information in corporate financial statements (see Ryan, 1997 and Ryan, 2011 for reviews). This literature analyzes the informativeness of recognized financial statement amounts in assessing firm risk (e.g., Beaver, Kettler, and Scholes, 1970), the informativeness of Form 10-K qualitative risk factor disclosures (e.g, Campbell et al., 2014; Kravet and Muslu, 2013; Hope, Hu, and Lu, 2016), the risk relevance of quantitative disclosures, including securitizations (Chen, Liu, and Ryan, 2008; Barth, Ormazabal, and Taylor, 2012), and financial instruments (e.g., Rajgopal, 1999; Thornton and Welker, 2004; Hodder, 2002; Sribunnak and Wong, 2006). More recently, Badia et al. (2020) provide evidence on the risk relevance of expected oil and gas reserves in Canada.[11]

NPLs and charge-offs (Wahlen, 1994), loan types (Liu and Ryan, 1995), and the distinction between the discretionary and the non-discretionary part of LLP (Beaver and Engel, 1996; Liu, Ryan, and Wahlen, 1997).

[11] With a certain parallelism to our paper, Badia et al. (2020) find that, although the reserves estimate mandated by the Canadian rules is more difficult to estimate and more prone to managerial discretion than O&G reserves disclosed under US rules (which impose the disclosure of a lower bound estimate), the disclosed amounts are informative about firm risk.

2. Institutional background

2.1. The regulatory switch from incurred to expected loan loss provisioning

Traditionally, bank loan loss allowances have been estimated based on the "incurred credit loss" model (ICL), according to which a loan loss provision is created if there is objective evidence of impairment (for example, as a result of one or more events occurring after the initial recognition of the asset with negative impact on the expected future cash flows of the loans). However, the financial crisis generated the perception that the ICL model used in bank accounting standards often resulted in insufficient and untimely provisions (Bischof, Laux, and Leuz, 2019). This is important because "too little, too late" provisioning could have generated "procyclicality" (i.e., a magnification of the fluctuations in an economic cycle by reinforcing the interaction between the financial system and the real economy) (Gaston and Song, 2014). The materiality of this issue has been supported by leading institutions such as the Financial Crisis Advisory Group (FCAG, 2009), the International Monetary Fund (IMF, 2014), the European Banking Authority (EBA, 2016), and the Bank for International Settlements (BIS, 2017).

In response to such concerns, the G20 leaders issued a mandate to reform international prudential and accounting standards along the lines suggested by the Financial Stability Forum's report on addressing procyclicality in the financial system (FSF, 2009). This included replacing the ICL with alternative approaches that "incorporate a broader range of available credit information", namely with a more forward-looking expected loss method using statistical information to identify probable future losses. This alternative approach is commonly known as the "expected credit loss" (ECL) model.

The new ECL approach has been embraced by accounting standard setters around the world. The International Accounting Standards Board (IASB) issued IFRS 9 (Financial Instruments) on 24 July 2014. The new standard replaced IAS 39 and was implemented for

the first time for the financial reports corresponding to the 2018 fiscal year with early adoption allowed. In June 2016, the US Financial Accounting Standards Board (FASB) issued ASU 2016-13, in which the ECL approach is referred to as "Current Expected Credit Loss" (CECL).[12] The CECL –which replaces the ICL approach in FAS 5 and FAS 114– will be implemented for the first time in the financial reports corresponding to fiscal year 2020 (see Online Appendix OB for more details on the historical origin and development of these standards).

2.2. Approaches to the accounting for expected credit losses

2.2.1. IFRS 9

Under IFRS 9, the process of computing the loan loss allowance (LLA) is as follows. To begin, the client is classified based on a rating scale. Then, the risk department defines possible future macroeconomic scenarios using forecasts for key economic indicators such as GDP growth, housing prices, interest rates, and unemployment rates. Most often banks consider three scenarios: a "pessimistic" scenario, an "optimistic" scenario, and an intermediate scenario –commonly referred to as "base" or "neutral" scenario– that often follows analysts' consensus. Based on the client's score, the bank assigns the loan a probability of default (PD) for each scenario. The risk department also estimates the "loss given default" (LGD) for each scenario, that is, the amount of money a bank would lose if the borrower defaults on the loan under each of the scenarios. Based on these values, the loan loss allowance (*LLA*) of each loan is computed as follows:

$$LLA = EAD * PD * LGD$$

[12] The Current Expected Credit Loss Model was introduced by FASB under ASU 2016-13 and codified within ASC 326 (ASU 2016-13 "Financial instruments—credit losses (topic 326): Measurement of credit losses on financial instruments").

where *EAD* is the exposure at default, i.e., the outstanding debt at the time of default. *PD* and *LGD* are, respectively, the expected probability of default and the expected loss given default computed based on the defined macroeconomic scenarios.

IFRS 9 considers different horizons for the estimation of PD according to a 3-stage classification of financial assets. A loan is considered to be in stage 1 "*if, at the reporting date, the credit risk on a financial instrument has not increased significantly since initial recognition*" (for example, newly-issued loans). A loan is considered to be in stage 2 "*if the credit risk on that financial instrument has increased significantly since initial recognition*" (for example, the client recently lost her job or the economic conditions have worsened substantially and the client's creditworthiness is significantly sensitive to such conditions). Finally, a loan is considered to be in stage 3 if the asset is already impaired (for example, the loan is "non-performing", as the client has already defaulted in the payments). According to IFRS 9, the PD of loans in stage 1 should be estimated over a horizon of 12 months (i.e., as the probability that the client will default over the following 12 months). The PD of loans in stage 2 should be estimated over the lifetime of the loan. The PD of loans in stage 3 is 100%, as these loans are non-performing. Appendix B includes a simplified numerical example to illustrate the accounting for expected credit losses under IFRS 9 and the difference from the treatment under IAS 39 and the US CECL (Online Appendix OC presents a modified version of this example relaxing some simplifying assumptions).

2.2.2. ASU 2016-13

The CECL ("Current Expected Credit Loss") model envisaged by FASB in ASU 2016-13 presents one important difference from IFRS 9; FASB opted for using the residual lifetime horizon for all exposures. As such, the US standard does not impose any 3-stage asset classification for the purpose of estimating expected losses. At the heart of this difference between the IASB and FASB approaches is that IASB gave preference to reflect

the economic substance of lending and credit losses, whereas FASB opted to ensure that an entity's loss allowance was sufficient to cover all credit losses expected to be incurred over the remaining life of financial instruments held by the entity (O'Hanlon, Hashim, and Li, 2015). The difference between IFRS 9 and CECL could have non-trivial implications. For example, using analytical and simulation techniques, Abad and Suarez (2018) and Buesa, Población, and Tarancón (2019) show that CECL generally leads to lower procyclicality, but at the cost of a large increase in provisions.

2.3. The ECL model and the COVID-19 crisis

The wake of the COVID-19 outbreak has raised the concern that IFRS 9 could have a procyclical effect, thereby exacerbating the economic damage of the pandemic. In anticipating a significant deterioration of credit conditions as a consequence of COVID-19, banks would be forced to increase provisions. This would result in lower earnings, lower capital ratios, and credit contraction precisely at the moment when lending is most needed. Recent research on IFRS 9 is consistent with this concern. As explained by Abad and Suarez (2018), the ECL model could decrease procyclicality by inducing banks to take action in early stages of the downturn while decreasing loss recognition at the worst moment of the crisis. However, these authors also show that the difficulty in anticipating the arrival of a contraction exacerbates the cyclical effects of IFRS. The current pandemic is a case in point: no one anticipated the COVID-19 outbreak (Borio and Restoy, 2020).[13]

[13] The potential procyclical effect of IFRS 9 in the COVID-19 crisis critically depends on the duration of the pandemic. The macroeconomic scenarios used to estimate credit losses are relatively long term (five years or more). Moreover, many mortgage loan contracts have a relatively long maturity (10 years or more). As such, if the pandemic is relatively short-lived and mitigated by government intervention, COVID-19 might not affect long-run expectations (and thus provisions will not increase significantly). If the crisis persists, however, the ECL model will end up reflecting significant future losses (i.e., higher provisions). Unfortunately, at the present moment there is significant uncertainty concerning the duration of the crisis.

Bank regulators and supervisors, accounting regulators, and legislators have reacted to this concern. Online Appendix OD summarizes these reactions in the US and Europe.[14] As explained by Borio and Restoy (2020), the authorities' response so far includes three types of initiatives: (i) allowing banks to temporarily suspend the application of the ECL model, (ii) enhancing existing arrangements so as to temporarily sterilize the effect on regulatory capital, and (iii) issuing pragmatic implementation guidance to avoid a boost in provisions. While these regulatory responses might be grounded on sound economic arguments, there is a scarcity of empirical research guiding these initiatives; little is known about whether the effect of IFRS 9 is first-order, and much less is known as to whether such effect is more pronounced in situations of adverse economic conditions.

3. Sample and measurement choices

Our sample includes "systemically important" (SI) banks covered by Datastream that were publicly traded in the period between 2014 and 2018. Our definition of "systemically important" banks follows the European Central Bank (ECB)'s classification criteria, namely size and economic importance (see Appendix C for details).[15] In addition, we impose that the bank is standalone or a parent/holding company (i.e., we exclude subsidiaries). We also exclude banks that are *not* classified by the Global Industry Classification Standard (GICS) in the following categories: "Diversified Banks", "Regional Banks" or "Diversified Capital Markets". Our tests require non-missing data on loan loss provisions. Finally, we focus on countries with non-missing sovereign CDS data.[16] This process results in a sample of 1,249

[14] Online Appendix OD includes regulatory responses in the US and Europe. Similar initiatives have been taken in other major economies. See for example, the reactions of the Bank of England and the Prudential Regulatory Authority in UK, and those of the Office of the Superintendent of Financial Institutions in Canada (https://www.bankofengland.co.uk/news/2020/march/boe-announces-supervisory-and-prudential-policy-measures-to-address-the-challenges-of-covid-19; https://www.osfi-bsif.gc.ca/Eng/fi-if/in-ai/Pages/DTI20200327_let.aspx).

[15] See https://www.bankingsupervision.europa.eu/banking/list/criteria/html/index.en.html

[16] Imposing non-missing sovereign CDS data excludes 29 banks from the following countries: Bangladesh, Belize, Bermuda, Faroe Islands, Georgia, Jordan, Liechtenstein, Malta, Mauritius, Malawi, Palestinian Territories, Syria, Togo, and Tanzania.

firm-year observations corresponding to 293 banks from 74 countries. The sample includes all publicly traded banks designated as "Globally Systemically Important Banks" by the Financial Stability Board (FSB) in 2019 except one.[17]

Next, we collect data on the implementation of IFRS 9 around the world (see Online Appendix OE for details). Based on these data, we include in the "treatment" group 189 banks that adopted IFRS 9 during fiscal year 2018.[18] The remaining 104 sample banks comprise the "control" group, which includes banks incorporated in countries where IFRS is not mandatory or countries that have adopted IFRS but where the IFRS 9 had still not been implemented by the end of the 2018 fiscal year. Based on this variation, we define *Treated* as one if the bank's financial reports in that year are subject to IFRS 9, and zero otherwise. As such, this variable captures time-series variation among banks in the treatment group as well as cross-sectional variation among banks in the treatment and control groups.

Treated also exhibits within-country variation, as some sample banks from the same country adopted IFRS 9 at different dates. This within-country variation has several sources. First, two of our sample banks voluntarily adopted IFRS 9 before the official implementation date. Second, some banks were allowed to follow an alternative accounting standard (e.g., IFRS or local GAAP). Third, the regulator allowed certain banks to delay the implementation of IFRS 9 (i.e., see China in Appendix OE). Fourth, the adoption of IFRS 9 was staggered due to variation in fiscal year ending dates (for example, some banks with fiscal year-end in September adopted IFRS in October 2018 rather than in January 2018).[19]

Table 1 presents descriptive statistics of our sample banks and the rest of public banks included in the Datastream universe. Consistent with being systemically important banks,

[17] Our sample excludes Group BPCE because this bank was not publicly traded during the sample period.
[18] While early adoption of IFRS 9 was allowed, only two banks chose to adopt the rule before the entry into force in 2018: National Australian Bank (1/10/2014) and Al Salam Bank-Bahrain (1/1/2017).
[19] See https://www.ifrs.org/issued-standards/list-of-standards/ifrs-9-financial-instruments/

Table 1 shows that our sample banks are significantly larger than other public banks in the Datastream universe.

4. Predictive ability of loan loss provisions

4.1. LLP and future risk

Following prior literature (e.g., Chen, Liu, and Ryan, S., 2008; Badia et al., 2020), we gauge whether reported LLP amounts provide risk-relevant information based on the empirical association between these amounts and future equity risk. To estimate the effect of switching from incurred to expected loan loss provisioning, we test whether, for our sample of SI banks, the LLP amounts reported under the ECL model are more closely associated with future firm risk than those disclosed under the ICL model. In particular, we estimate equation (1).

$$Risk_{t+1} = \delta_0 + \delta_1 LLP_t{*}Treated + \delta_2 LLP_t + \delta_3 Treated + \phi Controls_t + fixed\ effects + \varepsilon_t \quad (1)$$

where $Risk_{t+1}$ is one of the following three variables measuring firm risk (Ellul and Yerramilli, 2013). *Future_Volatility* is the standard deviation of daily stock returns calculated over one year from the filing of the annual report (in %). *Future_Avg*(|*Ret*|) is the average of absolute value of daily stock returns calculated over one year from the filing of the annual report (in %). *Future_Tail_Risk* is the absolute value of the average stock return over the 5% worst return days calculated over one year from the filing of the annual report (in %).

On the right-hand side of the model, the key variables are *LLP* and *Treated*. *LLP* is defined as the annual loan loss provisions divided by total assets (in %). *Treated* equals one if the loan loss provisions in that year are reported using the ECL model, and zero otherwise. Because the US had still not implemented CECL during our sample period (2020 is the first year of implementation of CECL in the US), in our sample *Treated* is equivalent to an

indicator variable for whether IFRS 9 is in force in the country in which the bank is incorporated.

The vector *Controls* includes variables which prior research finds are associated with equity risk and the levels of loan loss provisions. *Size* is the logarithm of end-of-year equity market value of the bank (Banz, 1981; Fama and French, 1992). *BM* is the end-of-year equity book-to-market ratio (Fama and French, 1992). *Past_Return* is the daily stock return compounded over 365 days before fiscal year-end (Jegadeesh and Titman, 1993; Carhart, 1997). *Net_Interest_income* is the bank's net interest income divided by total assets. *Income_Volatility* is the standard deviation of the ratio of net income before extraordinary items to total assets over the past five years. *Loans* is the amount of loans outstanding divided by total assets. *Common_Equity* is the bank's common equity divided by total assets.[20] *Δ_GDP* is the annual change in Real GDP, in % (measured over the bank's fiscal year). The specification includes firm-fixed effects to control for time-invariant variation across sample firms. We also include country-year fixed effects (i.e., we test variation within a given country in a given year) to control for the annual economic conditions in the sample countries.[21] Standard errors are clustered by firm. As the sample size is relatively small, we remove influential observations to ensure that the results are not driven by a few outliers (nonetheless, our inferences from equation (1) do not hinge on removing these observations).[22]

To the extent that the potential informational benefit of timely reserves is likely to be more pronounced in economic downturns (e.g., Ryan, 2011), we expect that the switch from the ICL to the ECL model has a material effect under deteriorating credit conditions. Thus,

[20] We re-estimate equation (1) replacing *Common_Equity* with alterative measures of the bank's capital: *Capital_Tier 1* and *Capital_Total*. We obtain the same inferences. We use *Common_Equity* because these alternative measures cause sample attrition: we lose 171 (96) observations using *Capital_Tier1 (Capital_Total*).
[21] To be clear, by country-year fixed effect we mean an indicator variable that equals one in a given country *and* in a given year, and zero otherwise.
[22] We exclude observations with studentized residuals greater than 2.5. For consistency, we proceed in the same way throughout the paper.

we integrate a measure of changes in the credit conditions of the sample countries into our research design. In particular, we estimate equation (1) partitioning the sample based on the change in the spread of the five-year sovereign credit default swap (CDS) corresponding to the country. We compute the fractional change between the average spread in 2018 (i.e., the year in which IFRS 9 entered into force) and the average spread in 2017. *Lower* (*Higher*) refers to countries for which the change in the sovereign CDS spread is below (above) the sample median.

Partitioning the sample based on spreads of sovereign CDS facilitates the interpretation of our tests in light of the COVID-19 crisis. As illustrated in Figure 1, during the early stages of the pandemic, sovereign CDS spreads increased simultaneously with the number of infected individuals in the country. Online Appendix OA presents formal tests of this association, which are robust to controlling for the daily MSCI World index return and to including country and week fixed effects. As such, partitioning the sample based on changes in sovereign CDS spreads could shed light on the potential effect of IFRS 9 in the context of the pandemic.

Table 2 presents coefficients from estimating equation (1), separating into countries with changes in CDS spreads below (above) the sample median. Most importantly, Table 2 reveals that, for the countries with more adverse changes in credit conditions, the coefficient on LLP_t**Treated* is significantly positive. In contrast, this coefficient is not statistically significant for countries with below-median changes in CDS spreads. This is consistent with the notion that, under IFRS 9, LLP are more risk-relevant, but IFRS 9 appears to matter mainly when credit conditions deteriorate.

To further corroborate that the results in Table 2 do not simply capture a secular increase in the informativeness of LLP, we next check whether the stronger association of LLP and subsequent risk measures after the introduction of IFRS 9 is sensitive to the

definition of the sample period and, thus, to the length of the period prior to the introduction of the ECL model (i.e., the control period).

Table 3 repeats the analysis of Table 2 using alternative definitions of the sample period. We first restrict the control period to 2017. That is, we re-estimate equation (1) including only observations from 2017 and 2018. This analysis offers the advantage that the control period (i.e., 2017) has the same length as the treatment period (i.e., the part of the sample period in which IFRS 9 is in force), namely one year. Moreover, this analysis further mitigates the concern that the patterns we document could simply reflect a time trend in the informativeness of LLP.

We next expand the control period backwards in a systematic way; we re-estimate equation (1) including observations from *T* to 2018, where *T*=2015, 2013, 2011, 2009, 2007, and 2005. In consistency with prior tests, the results in Table 3 show that, across all the definitions of the sample period, the coefficient on *LLP*Treated* remains positive and statistically significant for the "higher" group. Overall, the results in Table 3 suggest that, regardless of how the benchmark period is defined, the increase in the informativeness of LLP in the year of implementation of IFRS 9 is especially high.

4.2. Supervision and enforcement

To corroborate our inferences from Table 2, we explore a further source of cross-sectional variation in the probability that the LLP amounts are more informative, namely the intensity of bank supervision across sample countries. As shown by prior literature (e.g., Christensen, Hail, and Leuz, 2013; Bischof et al., 2020), the level of regulatory enforcement enhances the effect of accounting standards. In line with this prior research, we expect that, in our setting, stronger supervision will result in more informative LLP amounts.

We partition our sample based on *Supervisory_Intensity*, a measure of supervisory intensity constructed using data from the World Banks' 2019 Bank Regulation and

Supervision Survey. The use of these data is grounded on prior banking literature (e.g., Barth, Caprio, and Levine, 2013). We focus on seven items of the survey (see Appendix E for details). We focus on these items because they reflect the powers of the supervisory agency related to accounting, auditing, dividends, remunerations, and public information about formal enforcement actions. Moreover the answers in these items are binary (Yes/No), which allows us to construct a simple index: *Supervisory_Intensity* is defined as the sum of the indicator variables for the items of the survey. The index takes values ranging from zero (low supervision intensity) to seven (high supervision intensity).

Table 4 presents the results of partitioning the tests in Table 2 based on whether the value of *Supervisory_Intensity* for the country is above/below the sample median. Across all the models in Table 4, the magnitude of the coefficient on *LLP*Treatment*Δ_Credit_Risk* is higher when supervisory intensity is higher. That is, the effect of IFRS 9 on the informativeness of LLP is strongest when i) the country experiences worse credit conditions, and ii) in countries when supervision is tighter. This result is in line with Bischof, Laux, and Leuz (2019)'s concern that the level of enforcement affects banks' loss recognition and thus the potential effect of IFRS 9.

5. Discretion in LLP reporting

We next analyze whether the introduction of the ECL model affects firms' use of discretion in LLP reporting. A common concern about the ECL model is that forward-looking information about potential losses is more subject to managerial discretion than information of already realized losses. If that were the case, the results in Table 2 could reflect that LLP values are associated with the probability that the bank opportunistically manipulates its financial reports, thereby generating uncertainty about the firm's prospects.

That being said, while forward-looking estimations require managerial judgment, the mandate to disclose expected losses also restricts reporting discretion in some cases. In

particular, when the credit conditions deteriorate, the ECL model forces banks to incorporate bad news into provisions. In contrast, the ICL model provides managers with the choice of not increasing provisions unless the loss materializes. In other words, while under ICL managers have the option not to recognize bad news, under ECL managers are forced to recognize them.

To illustrate, consider a situation of adverse economic conditions in which a loan becomes more than 30 days overdue but less than 90 days. Under IFRS 9, the loan should be switched from stage 1 to stage 2, with a corresponding increase in provisions. However, under IAS 39, a bank manager can choose between increasing provisions for this loan or not, as there is no obligation to provision for the loan. Consistent with ICL providing substantial room for discretionary reporting of LLP, previous literature documents that a significant number of banks smooth earnings by using the discretion provided by the accounting standards for reporting higher values of provisions (e.g., Ryan, 2011; Beatty and Liao, 2014).

To empirically examine how IFRS 9 affects LLP discretionary reporting, we follow prior literature (e.g., Beatty, Ke, and Petroni, 2002; Bushman and Williams, 2012; Liu and Ryan, 2006) and measure discretionary LLP based on the residuals from the following model:

$$LLP = \delta_0 + \delta_1 NPL + \delta_2 \Delta\_NPL + \delta_3 Loans + \varepsilon \quad (2)$$

where *LLP* is the percentage of annual loan loss provisions to total assets. *NPL* is non-performing loans divided by total assets (Balboa, López-Espinosa, and Rubia, 2013; Wahlen, 1994). Δ*_NPL* is the annual change in non-performing loans divided by total assets (Beatty, Ke, and Petroni, 2002; Bushman and Williams, 2012; Andries, Gallemore, and Jacob, 2017). *Loan* is total loans divided by total assets (Beatty, Ke, and Petroni, 2002). The residual from equation (2), $\tilde{\varepsilon}$ (i.e., the variation in LLP not explained by economic determinants) is our measure of discretionary LLP. We refer to this metric as *Discretionary_LLP*.

Also following prior literature (Laeven and Majnoni, 2003; Beatty and Liao, 2011; Bushman and Williams, 2012; Beatty and Liao, 2014), we test whether *Discretionary_LLP* is related to earnings (before LLP and taxes) and to the bank's capital adequacy ratio. More specifically, we test whether such relations are different under IFRS 9:

$$Discretionary\_LLP_t = \gamma_0 + \gamma_1 Earnings\_BTP_t{*}Treated + \gamma_2 Capital\_Total_{t-1}{*}Treated + \gamma_3 Earnings\_BTP_t + \gamma_4 Capital\_Total_{t-1} + \phi Controls_t + Fixed\ effects + \varepsilon \quad (3)$$

Treated is as previously defined (i.e., one if the loan loss provisions in that year are reported using the ECL model, and zero otherwise). *Earnings_BTP* is net income before tax and discretionary loan loss provisions divided by total assets. *Capital_Total* is the regulatory capital adequacy ratio in year t-1, computed as total regulatory capital divided by risk-weighted assets. *Controls* is a vector of the following three control variables. *LLA* is the loan loss allowance in the prior year divided by total assets (Wahlen, 1994; Collins et al., 1995). *Log (Asset)* is the natural logarithm of total assets (Bushman and Williams, 2015; Andries, Gallemore, and Jacob, 2017; Hribar et al., 2017). *Securities* is bank's total securities divided by total assets (Balboa, López-Espinosa and Rubia, 2013; Barth et al., 2017);

Table 5 presents the results of this test. In addition to equation (3), Panel B includes a variant of this model that interacts *Earnings_BTP* with *X*, an indicator variable. In columns 3 and 4, *X* equals one if the magnitude of *Earnings_BTP* is above the sample median, and zero otherwise. In columns 5 and 6, *X* equals one if the magnitude of *Earnings_BTP* is in the top quartile of the distribution, and zero otherwise. We introduce this variant of equation (3) because prior literature documents that banks' incentives to manage earnings depend on the magnitude of earnings.[23]

[23] The literature distinguishes between four types of earnings management behavior: i) firms with large earnings managing earnings downwards (also referred to as "earnings smoothing" or "cookie jar" effect), ii) firms with small positive earnings managing earnings upwards (for example, to increase managerial bonuses), iii) firms with small negative earnings managing earnings upwards (to avoid negative earnings), iv) firms with large negative earnings managing earnings downwards (also referred to as "big bath"). The last two types of earnings

In Table 5, Panel C, we repeat the analysis using two capital ratios. *Capital_Total* is defined as in Panel B, namely as total regulatory capital divided by risk-weighted assets. *Capital_Tier1* is Tier 1 capital divided by risk-weighted assets. We repeat the analysis using these two variables because banks are required by regulators to meet a minimum level in both metrics. Moreover, the effect of an increase in LLP on these two ratios is not the same. Because LLP do not count as Tier 1 capital, LLP decreases the numerator of Tier 1 capital ratio by *(*1*−tax rate)*LLP*. However, the effect of LLP on total capital is not monotonic, as loan loss reserves count as Tier 2 capital up to 1.25% of risk-weighted assets. That is, LLP increases total capital by *(tax rate)*LLP*, but only as long as loan loss allowances do not exceed the 1.25% threshold.

For completeness, we also repeat our tests using variants of these measures that incorporate the regulatory capital adequacy thresholds in force in year *t*. We replace *Capital_Total* with *Excess_Capital_Total*, defined as the difference between *Capital_Total* (measured in *t*−1) and the minimum (total) capital adequacy ratio required by regulators. Similarly, we replace *Capital_Tier1* with *Excess_Capital_Tier1*, defined as the difference between *Capital_Tier1* (measured in t-1) and the minimum Tier 1 capital adequacy ratio required by regulators.[24]

In consistency with prior literature (e.g., Kirschenheiter and Melumad, 2002; Laeven and Majnoni, 2003; Liu and Ryan, 2006; Bushman and Williams, 2012, Kilic et al., 2013; Balboa, López-Espinosa, and Rubia, 2013; Barth et al., 2017), Table 5, Panel B, shows that the coefficient on the main effect of *Earnings_BTP* is positive and significant. This is consistent with the notion that banks smooth earnings by reporting higher values of LLP.

management are less common in banking, as banks rarely report losses (Shen and Chih, 2005). In our sample, only 0.8% of the banks report negative profits before tax and LLP. As such, we do not consider iii) and iv) in our research design.

[24] Information on the minimum to regulatory requirements is obtained from the website of the Bank for International Settlements. Taking into account the transitional period between 2014 and 2018 established by the Basel Committee, the minimum Tier 1 ratio in 2014 was 5.5% (in 2013 it was 4.5%) and 6% during the 2015-2018 period. The minimum Total Capital ratio was 8% during the 2014-2018 period.

However, the coefficient on the interaction of *Earnings_BTP* and *Treated* is negative and significant in the *Higher* subsample (said coefficient is insignificant in the *Lower* subsample). This suggests that, when credit conditions are more adverse, earnings smoothing is less prevalent under IFRS 9 than under IAS 39. This is consistent with the notion that, in such situations, the ECL model makes smoothing earnings more difficult by forcing banks to incorporate bad news into provisions (the ICL model provided more room for discretion in this regard).

Table 5, Panel C, shows that the coefficient on the interaction between *Capital_Tier1* and *Treated* is negative and significant in the *Higher* subsample, while insignificant in the *Lower* subsample. While the evidence is relatively weak, the pattern is consistent with the notion that the ECL model introduced by IFRS 9 makes it harder to improve the Tier 1 capital adequacy ratio. As previously argued, banks with lower Tier 1 capital have an incentive to report lower LLP, as LLP reduces Tier 1 capital. Thus, if banks manage the reporting of LLP amounts to meet Tier 1 capital ratios, we should observe a positive association between LLP and Tier 1 capital ratios. In turn, a negative coefficient on the interaction between *Treated* and *Capital_Tier1* is consistent with banks' reporting discretion being less pronounced under IFRS 9 than under IAS 39.

While not statistically significant, the coefficients in the *Lower* subsample take the opposite sign as in the *Higher* subsample. This is consistent with Bischoff et al. (2019)'s concern that, in some cases, IFRS 9 could lead to more reporting discretion. LLP reporting under relatively benign economic conditions could lead to more discretion because in such situations banks may but are not forced to switch loans to a higher stage (the decrease in credit quality is not as obvious as in the case of adverse economic conditions).

In parallel with Table 3, we check the sensitivity of these patterns to the length of the control period considered in the analysis (i.e., the period of years before the introduction of

IFRS 9). As shown in Online Appendix OF (Table OF1), the results of these additional tests are qualitatively the same as those in Table 5. However, because the results are weaker for certain definitions of the control period, we are hesitant to conclude that reporting discretion around LLP is lower under IFRS 9. In any case, the evidence in Table 5 (and Table OF1) is certainly not consistent with the notion that the ECL model introduced by IFRS 9 increases reporting discretion when credit conditions deteriorate.

Finally, we also explore the possibility that our results are driven by abnormal discretionary LLP reporting in anticipation of the entry into force of IFRS 9 (i.e., in the year prior to the implementation of IFRS 9). In particular, we repeat the tests in Table 5 replacing *Treated* with *Pre_Treated*, which equals one in the year prior to the bank's adoption of IFRS 9, and zero otherwise. Appendix OF (Table OF2) presents the results. As shown in Table OF2, we do not find any difference in banks' use of LLP reporting to manage earnings and/or capital ratios in the year prior to the implementation of IFRS 9.

To further investigate this issue, we test whether there is a decrease in the informativeness of LLP in the year before the entry into force of IFRS 9 (an increase in reporting discretion would induce a decrease in the informativeness of LLP amounts). In parallel to the previous test, we repeat the analysis in Table 2 replacing *Treated* with *Pre_Treated*, an indicator variable that equals one in the year prior to the bank's adoption of IFRS 9, and zero otherwise. Appendix OF (Table OF3) presents the results. As shown in Table OF3, we do not find any significant drop in the predictive ability of LLP in the year prior to the implementation of IFRS 9.

Taken together, the evidence in Table 5 and Appendix OF is hard to reconcile with the notion that the pattern in Table 2 is driven by abnormal discretionary LLP reporting in anticipation of the entry into force of IFRS 9. These results are also inconsistent with the

alternative explanation that the results in Table 2 are driven by the anticipation of a tightening of financial reporting enforcement simultaneous to the implementation of the new standard.

6. Market reaction to LLP information

To corroborate our interpretation of the previous results, we next examine the market reaction to the release of LLP information. Finding that the market reacts to LLP amounts in a way consistent with LLP providing information about firm risk would increase confidence in our inferences from the analyses in the previous section. We analyze changes in stock prices, bank CDS spreads, and bid-ask spreads using a short window around the release of LLP information.

If LLP reported under the ECL model are more informative about bank risk, we expect LLP information to elicit lower stock returns. As explained by Ryan (2011), when banks' loan loss accruals provide timely information about loan losses, loan loss accruals should have net negative stock market pricing implications. While LLP amounts can elicit a positive stock market reaction through signaling effects (e.g., the firm's ability/determination to deal with problematic loans), finding a negative price reaction to higher LLP amounts would suggest that the negative implications of the incremental information provided about loan losses outweighs the positive implications of any signaling effect of LLP.

Consistent with our prior tests showing that LLP amounts under the ECL model are more predictive of bank risk, we expect LLP information to elicit an increase in the CDS spread of the disclosing bank.[25] This expectation relies on CDS spreads capturing the probability of future credit default. The use of CDS spreads to measure changes in market

[25] A CDS is an insurance contract against a credit default by the reference entity. The buyer of the contract pays the seller periodically in exchange for the right to sell the debt for its face value should a default occur. The rate of the annual payment from the buyer is understood as the CDS spread, and is expressed in basis points.

expectations on credit risk around informational events is well-accepted in the accounting and finance literature (e.g., Callen, Livnat, and Segal, 2009; Wei and Yermack, 2011).[26]

Finally, if LLP amounts are informative concerning future firm risk, we expect that the release of such information elicits an increase in bid-ask spreads. Our expectation is based on prior market microstructure literature establishing a relation between bid-ask spreads and firm risk (e.g., Stoll, 1978). While an increase in bid-ask spreads could also be explained by an increase in uncertainty as a consequence of less reliable information, such an alternative explanation is directly tested (and rejected) in section 5. Moreover, while the use of bid-ask spread as risk proxy can be problematic (e.g., Garfinkel, 2009), prior research has also shown that it can be appropriate in some settings. For example, bid-ask spreads have been shown to be a reasonable proxy for firm risk if, as in our sample of international banks, forecast dispersion data or intra-day stock price data are unavailable (e.g., Garfinkel, 2009; Christensen, Hail, and Leuz, 2013).

We study banks' disclosures on the impact of the first application of IFRS 9 on loan loss allowances (these disclosures are often referred to as "day-one impact of IFRS 9 implementation").[27] In 2018, most banks issued a special disclosure containing two LLA figures: one estimated under IAS 39 and another one estimated under IFRS 9. This information was usually reported in the footnotes of the consolidated financial statements in the form of a reconciliation table explaining differences between IAS 39 and IFRS 9 impairments (see Appendix D for an example of these disclosures issued by CaixaBank, one of the banks in our sample). Thus, the two LLA figures reflect the same economic fundamentals measured under different criteria. As such, this one-time disclosure introduces

[26] Beyond data availability considerations, our focus on CDS spreads is consistent with prior literature arguing that credit risk is reflected more accurately and faster by CDS spreads than by bond prices (Callen, Livnat, and Segal, 2009; Shivakumar et al., 2011).

[27] See, for example, EBA's report on the "first observations on the impact and implementation of IFRS 9 by EU institutions" (https://eba.europa.eu/sites/default/documents/files/documents/10180/2087449/bb4d7ed3-58de-4f66-861e-45024201b8e6/Report%20on%20IFRS%209%20impact%20and%20implementation.pdf).

a unique opportunity to empirically identify the informational effect of IFRS 9 on LLA; by analyzing the market reaction to the difference between the two accounting treatments, we are able to control for the underlying economics determining LLA amounts.

We manually collect the "day-one impact" information as well as the corresponding disclosure dates from public disclosures.[28] We collect data made available by banks in their annual or interim reports (the "day-one impact" of IFRS 9 implementation is not available in the FINREP/COREP supervisory templates). In cases where information from annual or interim reports is not available (due to, for example, the reduced frequency of disclosures for certain institutions), we collect information from IFRS 9 transition reports. The timing and format of the disclosures exhibit substantial variation; some banks report the impact of the first application of IFRS 9 in the first quarterly interim report after the bank adopts IFRS 9, other banks make this disclosure in annual reports, yet other banks publish the figures in ad-hoc notes focused on the transition to IFRS 9.

We analyze the market reaction to disclosures on the impact of the "day-one impact" of IFRS 9 on impairment allowances. The variable of interest, *Day1_Impact*, is defined as $(LLA_{IFRS9} - LLA_{IAS39})/LLA_{IAS39}$, where LLA_{IFRS9} is loan loss allowance under IFRS 9 and LLA_{IAS39} is loan loss allowance under IAS 39.[29] Appendix D illustrates the computation of this variable using an observation from our sample. The mean (median) value of *Day1_Impact* in our sample is 0.24 (0.15), suggesting that, on average, the increase in LLA induced by IFRS 9 is substantial. The impact of IFRS 9 exhibits significant variation across banks (the standard deviation of *Day1_Impact* is 0.30).

[28] The total number of observations in Table 6 is slightly lower than the number of banks in the control group due to missing data and the exclusion of influential observations (while the effect of outliers could be large in this small sample test, in practice we obtain similar results when we do not exclude influential observations).

[29] Part of the impact of IFRS 9 on impairment allowances arises from reclassification of available for sale investments and financial assets recognized at fair value through other comprehensive income, and from provisions for undrawn contractually committed facilities and guarantee contracts. However, these amounts are small compared to loans and advances at amortized cost.

We examine the reaction in the stock market and in the CDS market. We first compute abnormal returns around the disclosure date. *Return* is the market-adjusted compounded abnormal stock return over (−5, +5) days around the disclosure date (expressed as a %). *Δ_CDS* is the change in abnormal CDS spread calculated as the difference between the abnormal CDS spread of day +5 and that of day −5 around the disclosure date. The abnormal CDS spread for a bank is calculated as the difference between the CDS spread of the bank and the corresponding benchmark CDS spread (see Appendix A for details). *Δ_Bidask* is the average bid-ask spread over the (−5, +5) day window around the disclosure date minus the average bid-ask spread over the (−109, −9) day window around that date. The vector of controls, *Controls*, is an in equation (1).

In parallel to our previous tests, we conduct the analysis separately for banks in countries with higher/lower increases in credit risk conditions. As before, we partition the sample based on below/above median values of *Δ_Credit_Risk*, defined as fractional change in the average spread of the five-year sovereign CDS of the country in the year corresponding to the disclosed provisions. We refer to these subsamples as "*Lower*"/"*Higher*".

Table 6 presents the results of these tests. For the subsample of countries with a more negative change in expected credit conditions (i.e., the "*Higher*" subsample), the "day-one impact" of IFRS generates a negative stock market reaction, an increase in CDS spreads, and an increase in bid-ask spreads. This evidence is consistent with the notion that the loan loss allowances disclosed under IFRS 9 convey additional information about bank risk. As explained by Ryan (2011), loan loss accruals elicit lower stock returns when the negative implications of any incremental information provided about loan losses outweigh the positive implications of any signaling effect of LLP (i.e., by reporting higher LLP, managers convey to the market that the bank's earnings power can withstand the negative impact of LLP on earnings). Taken together, the results in Table 6 are consistent with the notion that LLP

amounts reported under IFRS 9 convey more information about risk than the corresponding amounts reported under IAS 39.

7. Effect on the level of provisioning and lending

The results in the previous section are consistent with the notion that the loan loss provisions reported under IFRS 9 are more informative about future bank risk than those reported under the previous accounting regime. In other words, our evidence suggests that the implementation of IFRS is not inconsequential. Based on this conclusion, we next pose the question of whether the ECL model affects the level of provisioning and lending. This question is especially relevant considering the ongoing debate on whether IFRS 9 serves its intended purpose of mitigating procyclicality. Using simulation, Abad and Suarez (2018) show that the expected loss model imposed by IFRS 9 increases the level of provisions more suddenly than the incurred loss model used under the previous standard (IAS 39) when the economy switches from expansion to contraction. We explore the validity of this conclusion using recently available historical data.

7.1. Provisioning

Table 7 presents results of regressing changes in loan loss allowances on the interaction between *Treated* (i.e., the indicator variable for the implementation of IFRS 9 we use in previous tests) and *Higher_Credit_Risk*, an indicator variable that equals one if Δ*_Credit_Risk* is above the sample median (Δ*_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country), and zero otherwise. As in prior tests, we use the CDS spread of sovereign bonds to capture the overall credit conditions in the country. For robustness, we use two dependent variables. *Δ_LLA_A*, is defined as the difference in the balance of loan loss allowances with respect to the prior year divided by total assets. *Δ_LLA_%*, is defined as the percentage change in the balance of loan loss

allowances with respect to the prior year. As shown in the table, the interaction between *Treated* and *Δ_Credit_Risk* is positive and significant for both dependent variables. This suggests that, when credit conditions deteriorate, IFRS 9 leads banks to recognize substantially higher loan loss allowances.

7.2. Lending

Table 8, Panel A, repeats the analysis focusing on changes in the volume of loans in the bank's balance sheet. In parallel to the previous test, we use two dependent variables. *Δ_Loans_A* is defined as the difference in loans outstanding with respect to the prior year divided by total assets. *Δ_Loans_%* is defined as percentage change in loans outstanding with respect to the prior year. As shown in the table, the interaction between *Treated* and *Δ_Credit_Risk* is negative and significant. This suggests that, when credit conditions deteriorate, banks reporting under IFRS 9 extend substantially less credit.

To check that the pattern in loan volume documented in Table 8, Panel A, indeed relates to changes in loan loss allowances, we perform the following two-stage estimation. First, we compute $\widehat{\Delta\_LLA}$, namely the fitted value of the change in LLA from the regressions in Table 8. Second, we test whether $\widehat{\Delta\_LLA}$ is associated with changes in the volume of loans outstanding. For consistency, we conduct parallel analyses for changes scaled by assets (i.e., *Δ_Loans_A* and *Δ_Loans_A*), and percentage changes (i.e., *Δ_Loans_%* and *Δ_Loans_%*). As shown in Table 8, Panel B, the fitted value of loan loss allowances, $\widehat{\Delta\_LLA}$, is negatively associated with changes in outstanding loans. This evidence corroborates that, at least to a certain extent, the pattern in Table 8, Panel A, is driven by LLA. That is, the increase in LLA induced by IFRS 9 in countries with worse credit conditions is associated with a decrease in lending.

7.3. Capital ratios

Table 9 repeats the analysis focusing on capital ratios. Consistent with prior tests, we define two dependent variables. Δ_*Capital_Total* is the difference in the total capital ratio with respect to the prior year. Similarly, Δ_*Capital_Tier1* is the difference in Tier 1 capital ratio with respect to the prior year.

Similar to Table 9, Panel A, we first test whether the interaction between *Treated* and *Δ_Credit_Risk* is associated with changes in capital ratios. The results are shown in Table 9, Panel A. In parallel to the previous analysis on loan volume (i.e., Table 8, Panel B), we conduct a two-stage procedure in which we first compute $\widehat{\Delta\_LLA}$, namely the fitted value of the change in LLA from the regressions in Table 8. Similar to Table 8, Panel B, we next test whether $\widehat{\Delta\_LLA}$ is associated with changes in capital ratios. Table 9, Panel B, presents the results.

As shown in Table 9, we find little change in capital ratios when the bank switches to IFRS 9 and the country has relatively worse credit conditions. Finding weak evidence on the effect of IFRS 9 on capital ratios is not surprising, as banks take action to avoid lower values of these metrics (which could trigger regulatory intervention). The results in Table 8 suggest that reducing credit is one of those actions. As such, taken together, the results in Tables 7 through 9 are consistent with the interpretation that, under adverse credit conditions, IFRS 9 induces banks to reduce credit. Under such conditions, the new standard leads to an increase in loan loss allowances that needs to be offset by lowering the level of loans outstanding in order to avoid a decrease in capital ratios (a smaller amount of loans outstanding reduces the value of the regulatory measure of risk-weighted assets, thereby increasing the capital adequacy ratio).

8. Conclusions

We study the informational effects of recent rule changes around the world mandating loan loss provisioning (LLP) based on *expected* credit losses (ECL). These rule changes – implemented in 2018 in many countries around the world and in 2020 in the US– deviate from previous standards that required provisioning based on *incurred* losses.

Exploiting the recent switch from IAS 39 to IFRS 9 in a number of countries, we find that IFRS 9 provisions are more predictive of future bank risk than IAS 39 provisions. This pattern does not appear to be driven by an increase in reporting discretion as a result of the new standard. We also find that the predictive ability of loan loss provisions is more pronounced in countries with worsened credit conditions and more intense supervision and enforcement.

To sharpen identification, we exploit disclosures on the impact of the first application of IFRS 9 on loan loss allowances (in the financial reports issued in 2018, most of the banks reported two LLA figures: one estimated under IAS 39 and another one estimated under IFRS 9). We find that these disclosures elicit lower stock returns, higher changes in CDS spreads, and higher changes in bid-ask spreads.

We also provide early evidence on the effect of IFRS 9 on the level of provisioning and credit. We find evidence that, under worse credit conditions in the country, the introduction of IFRS 9 results in an increase in loan loss allowances and a decrease in the amount of loans outstanding.

Overall, our results are consistent with the notion that the ECL model results in more informative provisions, especially when credit conditions deteriorate. However, our evidence also suggests that, in such situations, the rule change can induce a contraction of credit. These results have implications for the potential procyclical effect of IFRS 9 in the current COVID-

19 crisis: our evidence supports recent attempts by major bank regulators and legislators to mitigate such effect.

To the extent that our results are limited to the first year of implementation of IFRS 9, our study calls for further research on the effect of the ECL model. It is possible that the effect of IFRS 9 varies over time as a result of learning or other dynamics. It is also plausible that the effect of implementing the CECL in the US differs from that of implementing IFRS 9 in other countries. The difference could be driven not only by the significant differences between the two standards, but also by the unique institutional characteristics of the US. The empirical examination of these issues will become possible as data on the implementation of CECL and data on subsequent years' IFRS 9 implementation become available. We look forward to this future research.

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Appendix A. Variable definitions

Experimental variables:

Treated	Indicator variable that equals one if LLP is reported under IFRS 9 and zero otherwise.
LLP	Annual loan loss provisions divided by total assets, in %.
Discretionary_LLP	Discretionary component of *LLP* computed as the residual from equation (2).
Day1_Impact	*Day1_Impact* is defined as $(LLA_{IFRS9} - LLA_{IAS39})/LLA_{IAS39}$, where LLA_{IFRS9} is loan loss allowance under IFRS 9 and LLA_{IAS39} is loan loss allowance under IAS 39, both corresponding to the same reporting period.

Other key variables:

LLA	Loan loss allowance in the prior year divided by total assets, in %.
Loans	Bank's total loans divided by total assets.
Earnings_BTP	Profit before tax and discretionary provisions divided by total assets, in %.

Measures of bank risk

Future_Volatility	Standard deviation of daily stock returns (in %) over one year from the filing of the annual report.
Future_Avg(|Ret|)	Average of absolute value of daily stock returns (in %) calculated over one year from the filing of the annual report.
Future_Tail_Risk	Average return on the bank's stock (in %) over the 5% worst return days for the bank's stock over one year from the filing of the annual report.

Mediating variables:

Δ_Credit_Risk	Annual fractional change in the average spread of five-year sovereign CDS of the country.
Supervisory_Intensity	Index measuring supervisory intensity in the country. The index is constructed from the World Banks' 2019 Bank Regulation and Supervision Survey (see Barth, Caprio, and Levine, 2013 and Appendix E for details).

Capital ratios:

Capital_Total	Total Capital to risk-weighted assets ratio.
Capital_Tier1	Tier1 Capital to risk-weighted assets ratio.

Controls:

Size	Logarithm of Bank's total market capitalization, in USD.
BM	Ratio of book value of equity to market value of equity measured at the end of the fiscal year.
Past_Return	Stock return compounded daily over the one-year period prior to fiscal year end.
Net_Interest_Income	Bank's net interest income divided by total assets, in %.

Income_Volatility	Standard deviation of the ratio of net income before extraordinary items to total assets over the past five years.
Log(Assets)	Logarithm of bank's total assets, in USD.
Securities	Bank's total investment in securities divided by total assets.
NPL	Bank's non-performing loans divided by total assets, in %.
Δ_NPL	Annual change in non-performing loans divided by total assets.
Common Equity	Bank's common equity divided by total assets, in %.
Δ_GDP	Annual change in Real GDP based on fiscal year for each bank, in %.
Market reaction:	
Return	The market-adjusted compounded abnormal stock return (in %) over (−5, +5) days around the disclosure of the "day1-impact of IFRS 9". Abnormal returns are computed using the Fama-French 3-factor model over the period of (-109, -9) days around the disclosure date.
Δ_CDS	Change in abnormal CDS spread (in bp), calculated as the difference between the abnormal CDS spread of day +5 and that of day -5 around the disclosure of the "day1-impact of IFRS 9". The abnormal CDS spread for a bank is computed as the difference between the CDS spread for the bank and the corresponding benchmark CDS spread. To obtain the corresponding benchmark CDS spread, we first sort our CDS dataset based on the S&P's long-term foreign currency issuer rating for each day. Then we calculate the equally-weighted average of banks' CDS spreads for those with investment grade ratings and those with sub-investment grade ratings. We use the investment grade benchmark CDS if the bank has investment grade rating, and the sub-investment grade benchmark CDS if the bank has sub-investment grade rating. See Cornett et al. (2014) for reference.
Δ_Bidask	Average Bid-Ask spread (in %) over the (-5, +5) day window around the disclosure of the "day1-impact of IFRS 9" minus the average bid-ask spread over the (-109, -9) days around the disclosure date.

Appendix B. Example of LLP computation under different accounting treatments

This appendix illustrates the accounting for loan loss provisions under IFRS 9 through a simplified numerical example (online Appendix OE presents a more sophisticated version of this analysis taking into account the effective interest rate and the cumulative lifetime and marginal probability of default). The example includes the language and abbreviations commonly used in the estimation of loan loss provisions.

Consider a corporate 10-year loan of 450,000 euros without collateral originated on 12-31-2019. The risk department of the bank evaluates the application, estimates the scoring, and classifies this client into the level 5 (A+) of the rating scale.

The "loan loss allowance" (LLA) for the loan in each year is computed as follows:

$$LLA = EAD*PD*LGD$$

where *EAD* is the exposure at default, namely the outstanding debt at the time of default. *PD* is the probability of default and *LGD* is the loss given default. Note that LLA is a "stock" measure (it includes the accumulated reserves for loan losses). Assuming that there are no other sources of change in LLA, the annual expense related to the credit risk of financial instruments is the change in LLA year-on-year. This annual expense is a "flow" measure commonly referred to as "loan loss provision" (LLP).

At the beginning, the EAD is 450,000 euros (i.e., the amount of money lent). The estimates of the PD and LGD are made based on three future macroeconomic scenarios ("pessimistic", "base", and "optimistic"). The PD is estimated over the next 12 months ("12-months") and over the entire lifetime of the loan contract ("Lifetime"). The risk department also estimates the probability of each scenario. The computations of LLA use the expected values of these parameters (bottom row).

		PD		
Scenarios	Probability	12-months	Lifetime	LGD
Pessimistic	30%	0.062%	1.068%	82.25%
Base	40%	0.031%	0.476%	53.26%
Optimistic	30%	0.012%	0.014%	40.72%
Expected value		0.035%	0.515%	58.20%

The estimations for these scenarios are based on the rating of the loan (in this case A+) and forecasts for GDP growth, housing prices, interest rate, and unemployment rate (often taken from analysts' consensus). In this case:

	Horizon: 2020-2014		
	Pessimistic scenario	Base scenario	Optimistic scenario
Interest rate	0.4%	0.8%	1.3%
Unemployment rate	16.3%	12.7%	11.2%
Housing price change	0.4%	1.9%	3.4%
GDP growth	0.8%	1.5%	2.3%

The evolution of the loan over years 1, 2, and 3 is as follows:

Year 1 (2019)	- The loan contract is signed at the end of year 1.
Year 2 (2020)	- The EAD at the end of year 2 is 425,000 euros - PD-lifetime and LGD remain the same. - In year 2 there is a significant event suggesting a deterioration of the client's ability to honor her commitment (the payment is 30 days past due).
Year 3 (2021)	- The EAD at the end of year 3 is 407,000 euros - The LGD remains the same. - In year 3 the loan contract is credit-impaired; the payment is 90 days past due.

The computations of LLA under IFRS 9, IAS 39, and ASU 2016-13 (i.e., CECL in the US) are as follows:

LLA according to IFRS 9

Year 1:

As this is a new loan, the asset is considered to be in "stage 1" under IFRS 9. Accordingly, the estimation of LLA uses the probability of default over a 12-month horizon:

$$\text{LLA} = \text{EAD}*\text{PD}*\text{LGD} = 450{,}000*(0.035/100)*(58.2/100) = 91 \text{ euros}$$

Year 2:

As there is a deterioration of the client's ability to honor her commitment, IFRS 9 presumes that the loan should be classified in "stage 2". Accordingly, the estimation of the LLA uses the probability of default over the lifetime of the loan:

$$\text{LLA} = \text{EAD}*\text{PD}*\text{LGD} = 425{,}000*(0.515/100)*(58.2/100) = 1{,}273 \text{ euros}$$

Year 3:

As the loan contract is credit-impaired, IFRS 9 presumes that the loan should be classified in "stage 3". Accordingly, the PD =1 (the probability of default is 100%) and the computation of the LLA is as follows:

$$\text{LLA} = \text{EAD}*\text{PD}*\text{LGD} = 407{,}000*1*(58.2/100) = 236{,}874 \text{ euros}$$

LLA according to IAS 39

Under IAS 39, LLA includes only incurred losses. That is, the computation of LLA only includes non-performing loans (i.e., loans that under IFRS 9 would be considered to be in "stage 3"). Accordingly, this approach does not contemplate several scenarios. Thus, the LLA under IAS 39 would be the following:

Year 1: LLA=0
Year 2: LLA=0
Year 3: LLA= EAD*PD*LGD = 407,000*1*(53.26/100) = 216,768 euros

Note that LGD corresponds to the "base" scenario because IAS 39 only contemplates one scenario.

LLA according to ASU 2016-13 (US CECL)

Under US CECL, the PD is always estimated over the lifetime of the loan. Accordingly, there is no need to consider whether the loan is in "stage 1" or in "stage 2". The computation of the loan loss allowance is as follows:

Year 1: LLA= EAD*PD*LGD = 450,000*(0.515/100)*(58.20/100) = 1,348 euros
Year 2: LLA= EAD*PD*LGD = 425,000*(0.515/100)*(58.20/100) = 1,273 euros
Year 3: LLA= EAD*PD*LGD = 407,000*1*(58.20/100) = 236,874 euros

Annual Loan Loss Provision (LLP)

If the bank only had this loan in its balance sheet, the LLP in each of the years would be the change in LLA, namely:

	IFRS 9	IAS 39	US CECL
Year 1	91	0	1,348
Year 2	1,273−91=1,182	0	1,273−1,348=−75
Year 3	236,874−1,273=235,601	216,768	236,874−1,273=235,601

Appendix C. Sample selection criteria

Panel A presents the process of constructing our sample of systemically important banks. Panel B presents the distribution of the sample banks by country and based on whether the banks adopt IFRS 9 during the sample period.

Panel A. Sample construction

Number of banks recorded by Datastream from FY2004 to FY2018	1,964
of which	
Banks with total Assets (average over the past 5 years) above $50bn (in USD) or with total Assets (average over the past 5 years) greater than 20% of GDP of the country (averaged over the past 5 years) (in USD) or 3 largest banks in each country in terms of Total Assets (averaged over the past 5 years) (in USD)	401
of which	
Banks that are standalone or a parent/holding company	344
of which	
Banks that are classified as "Diversified Banks", "Regional Banks" or "Diversified Capital Markets" by Global Industry Classification Standard (GICS)	333
of which	
Not missing data on LLP	322
Not missing data on sovereign CDS	293
Number of sample banks	**293**

Panel B. Sample composition

	Total number of sample banks	"Treated" banks (i.e., adopt IFRS 9 in FY2018)	"Control" banks (i.e., do NOT adopt IFRS 9 in FY2018)
Europe	75	73	1
Middle East and Africa	59	50	9
China, Hong Kong	34	24	10
Japan	29	0	29
Rest of Asia	53	30	23
Australia	5	3	2
USA	17	0	17
LATAM	12	2	10
Rest of America	9	7	2
Total	293	189	104

Notes:

Europe: Austria (3), Belgium (1), Bulgaria (1), Croatia (1), Cyprus (2), Czech Republic (1), Denmark (3), Estonia (1), Finland (3), France (5), Germany (2), Greece (4), Hungary (1), Iceland (2), Ireland (3), Italy (7), Lithuania (1), Netherlands (2), Norway (3), Poland (2), Portugal (1), Romania (1), Russia (3), Serbia (2), Slovenia (1), Spain (7), Sweden (3), Switzerland (2), Ukraine (1), UK (6)

Middle East and Afica: Bahrain (6), Egypt (2), Ghana (1), Iraq (1), Israel (4), Kazakhstan (3), Kenya (3), Kuwait (3), Lebanon (4), Morocco (3), Namibia (1), Nigeria (3), Oman (3), Qatar (3), Rwanda (1), Saudi Arabia (5), South Africa (3), Tunisia (2), Turkey (5), UAE (3)

Rest of Asia: India (10), Indonesia (3), Malaysia (5), Pakistan (3), Philippines (3), Singapore (3), South Korea (6), Sri Lanka (3), Taiwan (10), Thailand (4), Vietnam (3)

LATAM: Argentina (3), Brazil (3), Chile (2), Colombia (2), Peru (2)

Rest of America: Canada (6), Costa Rica (1), Mexico (2)

Appendix D. Example of disclosure on "day-one impact of IFRS 9"

This appendix presents an example of public disclosure on the "day-one impact" of IFRS 9 on impairment allowance (i.e., the difference in loan loss allowances induced by IFRS 9). The information in Table D1 below is collected from CaixaBank's Biannual Report for fiscal year 2018.

Table D1. Changes to the allowances for impairment losses on assets – Loans and advances to customers (Thousands of euros)

	In Stage 1:	In Stage 2:	In Stage 3:	Total
Balance at 31-12-2017	1,313,785		5,502,032	6,815,817
1st Application IFRS 9	(342,038)	588,954	516,090	763,006
Balance at 01-01-2018	971,747	588,954	6,018,122	7,578,823

Source:
https://www.caixabank.com/deployedfiles/caixabank/Estaticos/PDFs/MEMGRUPCAIXABANK_30062018_WEB_ING.pdf

The Table reconciles the closing impairment allowances for financial assets in accordance with IAS 39 as at 12-31-2017 and the opening impairment allowance determined under IFRS 9 as of 1-1-2018, the date CaixaBank adopted IFRS 9.

The variable *Day1_Impact* used in our tests is defined as $(LLA_{IFRS9} - LLA_{IAS39})/LLA_{IAS39}$, where LLA_{IFRS9} is loan loss allowance under IFRS 9 and LLA_{IAS39} is loan loss allowance under IAS 39. In the example above, LLA_{IFRS9} is the balance at 12-31-2017 and LLA_{IAS39} is the balance at 01-01-2018.

$$Day1\_Impact = 763{,}006 / 6{,}815{,}817 = 0.11$$

That is, in this case the adoption of IFRS 9 leads to about an 11% increase in the loan loss allowance.

Appendix E. Measures of supervisory and enforcement intensity

This appendix presents the data items used to construct the *Supervisory_Intensity* index. The index is computed as the sum of the scores corresponding to the items. The scores equal one if the answer to the corresponding question is "YES", and zero otherwise.

#	Item	Possible scores
1	Does the banking supervisor have the right to meet with the external auditors and discuss their report without the approval of the bank (choose the most appropriate option)?	0, 1
2	In cases where the supervisor identifies that the bank has received an inadequate audit, does the supervisor have the power to take actions against the external auditor?	0, 1
3	Do supervisors require banks to publicly disclose all fines and settlements resulting from non-compliance with regulations?	0, 1
4	Does the supervisory agency have the power to require banks to constitute provisions to cover actual or potential losses?	0, 1
5	Does the supervisory agency have the power to require banks to reduce or suspend dividends to shareholders?	0, 1
6	Does the supervisory agency have the power to require banks to reduce or suspend bonuses and other remuneration of bank directors and managers?	0, 1
7	Are bank regulators/supervisors required to make public formal enforcement actions, which include cease and desist orders and written agreements between a bank regulatory/supervisory body and a banking organization?	0, 1

Figure 1. COVID-19 and credit conditions

The figure plots the time-series of the average of five-year CDS spreads of sovereign bonds for eight countries (US, Spain, Italy, UK, Germany, France, Russia, China, left vertical axis, in basis points) and the logarithm of the number of COVID-19 cases registered in the country (right vertical axis). Data on CDS spreads of sovereign bonds are collected from Capital IQ. Data on COVID-19 cases are collected from the WHO's daily situation reports.

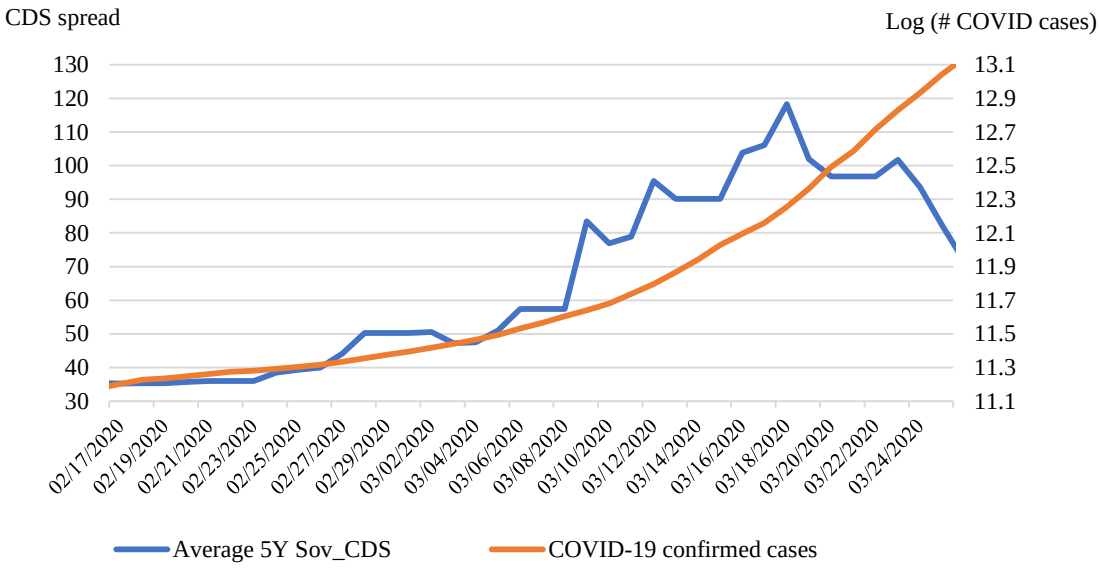

Table 1. Descriptive statistics

This table presents descriptive statistics of the sample including a panel of 1,249 firm-year observations from 2014 to 2018. We also put descriptive statistics for the raw dataset we obtained from Datastream for reference. See Appendix A for variable definitions and Appendix B for our sample selection criteria. All the variables are winsorized at 1 and 99 percentiles.

	Sample banks ("Systemically Important")				*Universe of banks in Datastream*			
Variable	*Mean*	*Median*	*Std. dev*	*N*	*Mean*	*Median*	*Std. dev*	*N*
LLP	0.52	0.29	0.68	1,249	0.49	0.19	0.80	6,699
LLA	2.06	1.11	2.84	1,190	1.69	0.89	2.22	5,747
Loans	0.62	0.64	0.14	1,249	0.66	0.68	0.15	5,932
Future_Volatility	2.44	1.79	3.77	1,249	3.23	1.77	5.91	6,423
Future_Avg(|Ret|)	2.10	1.40	3.59	1,249	3.02	1.36	6.57	6,423
Future_Tail_Risk	4.36	3.53	4.34	1,249	5.18	3.60	6.51	6,423
Earnings_BTP	1.56	1.29	1.39	1,150	1.59	1.31	1.48	4,630
Capital_Total	0.16	0.15	0.03	1,159	0.16	0.15	0.05	5,268
Capital_Tier1	0.13	0.13	0.03	1,082	0.14	0.13	0.05	4,874
Size	9.00	9.04	1.53	1,249	6.38	6.32	2.13	6,299
BM	1.25	1.02	0.79	1,249	1.19	0.93	0.82	6,559
Past_Return	−0.04	0.00	0.31	1,249	0.00	0.01	0.31	6,359
Net_Interest_Income	2.25	2.01	1.30	1,249	2.96	2.85	1.62	6,956
Income_Volatility	0.29	0.15	0.49	1,249	0.52	0.20	0.96	6,413
Log(Assets)	18.49	18.31	1.55	1,249	15.55	15.37	2.17	7,112
Securities	0.25	0.23	0.11	1,249	0.22	0.20	0.13	7,033
NPL	3.08	1.32	5.74	1,171	2.39	1.15	3.63	4,982
Common Equity	8.26	7.56	3.08	1,249	11.14	9.73	7.54	7,092
Δ_GDP	3.14	2.73	2.32	1,249	3.01	2.65	2.20	6.924

Table 2. Predictive ability of loan loss provisions

This table presents an analysis of the effect of IFRS 9 on the ability of loan loss provisions to predict bank risk for different credit conditions in the country. The dependent variables *Future_Volatility, Future_Avg(|Ret|),* and *Future_Tail_Risk* are measures of future risk over year t+1 (see Appendix A for detailed variable definitions). *LLP* is loan loss provisions in year t divided by total assets. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm and *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable:					
	Future_Volatility		*Future_Avg(|Ret|)*		*Tail Risk*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)
*LLP*Treated*	0.19	1.19***	0.15	0.80***	0.10	4.36***
	(1.25)	(2.94)	(1.35)	(2.58)	(0.67)	(3.25)
LLP	0.24	−0.16	0.21	−0.17*	0.14	−1.06*
	(1.13)	(−1.16)	(1.43)	(−1.75)	(0.64)	(−1.80)
Treated	−0.15	−2.41***	−0.11	−1.56***	−0.36	−6.14***
	(−0.72)	(−7.80)	(−0.77)	(−5.86)	(−0.85)	(−6.10)
Controls:						
Size	−0.46	−0.49***	−0.32	−0.30**	−0.07	−0.41
	(−1.59)	(−3.17)	(−1.35)	(−2.32)	(−0.23)	(−0.93)
BM	−0.14	−0.35**	−0.10	−0.35**	−0.33	−2.42***
	(−0.77)	(−2.24)	(−0.66)	(−2.25)	(−1.05)	(−3.99)
Past_Return	−0.20	−0.45**	−0.18	−0.74**	0.40	−2.56***
	(−0.73)	(−2.06)	(−0.87)	(−2.44)	(0.87)	(−3.80)
Net_Interest_Income	−0.29*	−0.15	−0.25**	−0.13	−0.24	−1.27***
	(−1.72)	(−1.25)	(−2.08)	(−1.54)	(−0.69)	(−2.86)
Income_Volatility	0.03	0.14	0.07	0.05	0.05	−0.01
	(0.12)	(1.57)	(0.30)	(1.00)	(0.17)	(−0.02)
Loans	2.32*	0.49	1.78**	0.09	3.04	3.08
	(1.92)	(1.01)	(2.09)	(0.26)	(1.63)	(1.63)
Common Equity	-0.14*	0.02	-0.09	0.05*	-0.16	0.02
	(-1.77)	(0.68)	(-1.62)	(1.65)	(-1.17)	(0.18)
Δ_GDP	−0.26*	−1.50**	−0.16	−1.21**	−1.04**	−1.14
	(−1.89)	(−2.38)	(−1.59)	(−2.18)	(−2.16)	(−0.95)
Country-year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.873	0.942	0.894	0.911	0.778	0.809
N	541	617	541	613	534	620

Table 3. Alternative sample periods

This table repeats the analysis in Table 2 for alternative lengths of the sample period. In Panel A, B, and C the dependent variables are, respectively, *Future_Volatility*, *Future_Avg(|Ret|)*, and *Future_Tail_Risk*. These are measures of future risk over year t+1 (see Appendix A for detailed variable definitions). *LLP* is loan loss provisions in year t divided by total assets. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). The sample includes a panel of firm-year observations from 2005 to 2018 corresponding to our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm and *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

Panel A. Future volatility

	Dependent variable: *Future_Volatility*													
Sample period:	*2017-2018*		*2015-2018*		*2013-2018*		*2011-2018*		*2009-2018*		*2007-2018*		*2005-2018*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
*LLP*Treated*	0.06	1.29**	0.16	0.98**	0.23	1.69***	0.32	1.26***	0.28	1.35***	0.27	1.15**	0.23	1.16**
	(0.52)	(2.35)	(1.07)	(2.08)	(1.24)	(3.24)	(1.27)	(2.79)	(1.20)	(2.55)	(1.02)	(2.14)	(0.93)	(2.21)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.872	0.937	0.865	0.919	0.872	0.854	0.879	0.864	0.879	0.850	0.875	0.881	0.863	0.882
N	232	252	441	496	634	734	796	950	953	1,129	1,091	1,273	1,216	1,393

Panel B. Absolute value of returns

	Dependent variable: *Future_Avg(|Ret|)*													
Sample period:	*2017-2018*		*2015-2018*		*2013-2018*		*2011-2018*		*2009-2018*		*2007-2018*		*2005-2018*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
*LLP*Treated*	0.08	0.66*	0.13	0.69*	0.16	0.81***	0.22	0.70**	0.20	0.76**	0.21	0.67*	0.19	0.72*
	(0.81)	(1.80)	(1.23)	(1.81)	(1.19)	(2.72)	(1.19)	(2.23)	(1.07)	(2.02)	(1.08)	(1.77)	(1.01)	(1.87)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.904	0.956	0.896	0.942	0.892	0.911	0.912	0.911	0.907	0.903	0.896	0.905	0.894	0.904
N	232	252	441	498	636	728	801	946	960	1,125	1,099	1,270	1,231	1,390

Table 3. Alternative sample periods (continued)

Panel C. Tail risk

Sample period:	Dependent variable: *Future_Tail_Risk*													
	2017-2018		*2015-2018*		*2013-2018*		*2011-2018*		*2009-2018*		*2007-2018*		*2005-2018*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
*LLP*Treated*	−0.25	3.14**	0.10	3.25**	0.36	4.49***	0.12	3.35**	0.03	3.44**	0.16	3.45**	0.06	3.49**
	(−1.09)	(2.15)	(0.30)	(2.40)	(0.94)	(3.17)	(0.55)	(2.80)	(0.16)	(2.54)	(0.61)	(2.51)	(0.33)	(2.56)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.862	0.899	0.796	0.811	0.790	0.778	0.811	0.805	0.804	0.778	0.797	0.790	0.783	0.790
N	226	252	437	498	627	739	787	957	941	1,132	1,078	1,274	1,204	1,394

Table 4. Banking supervision

This table presents an analysis of the effect of IFRS 9 on the ability of loan loss provisions to predict bank risk for different intensity of bank supervision. The dependent variables *Future_Volatility, Future_Avg(|Ret|)* and *Future_Tail_Risk* are measures of future risk over year t+1 (see Appendix A for detailed variable definitions). *Lower* (*Higher)* indicates below (above) median values of *Supervisory_Intensity*, an index constructed based on the World Bank's 2019 Bank Regulation and Supervision Survey (see Appendix E for details). *Higher_Credit_Risk* is an indicator variable which takes one if *Δ_Credit_Risk* is above the sample median, and zero otherwise (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). *LLP* is loan loss provisions in year t divided by total assets. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. The rest of the empirical specifications are the same as in Table 2. The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. See Appendix A for variable definitions. Standard errors are clustered by firm and *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable:					
	Future_Volatility		*Future_Avg(|Ret|)*		*Future_Tail_Risk*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)
*LLP*Treated*Higher_Credit_Risk*	0.35	1.05**	−0.02	0.80*	3.81**	4.11**
	(0.54)	(2.43)	(−0.04)	(1.93)	(2.25)	(2.27)
Double interactions	YES	YES	YES	YES	YES	YES
Main effects	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.914	0.850	0.925	0.938	0.823	0.757
N	499	646	501	638	486	649

Table 5. Reporting discretion

This table presents an analysis of the effect of IFRS 9 on banks' discretionary LLP reporting. Panel A presents the results of the model to compute discretionary LLP. The dependent variable in Panel A, *LLP*, is loan loss provisions in year t divided by total assets (the independent variables are defined in Appendix A). In Panels B and C, the dependent variable, *Discretionary_LLP*, is computed as the residual from the regressions in Panel A. *Earnings_BTP* is net income before taxes and discretionary LLP provisions (measured using the model in Panel A). In Panel B, X is one of the following indicator variables: *Above_Median* equals one if *Earnings_BTP* is above the sample median, and zero otherwise; *Top_Quartile* equals one if *Earnings_BTP* is in the top quartile of the sample, and zero otherwise ("n.a." means "not applicable"); In Panel C, *Y* is one of the following variables. *Capital_Total* is the total capital adequacy ratio. *Capital_Tier1* is the capital adequacy Tier 1 ratio. *Excess_Capital_Total* is the difference between *Capital_Total* and the minimum (total) capital adequacy ratio required by regulators. *Excess_Capital_Tier1* is the difference between *Capital_Tier1* and the minimum tier 1 capital adequacy ratio required by regulators. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is defined as the fractional change in the spread of the five-year sovereign CDS of the country). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

Panel A. Model to compute discretionary LLP

	Dependent variable: *LLP*					
	Lower			*Higher*		
Independent Variables:	(1)	(2)	(3)	(4)	(5)	(6)
NPL	0.05***	0.02***	0.02*	0.09***	0.09***	0.08***
	(9.35)	(2.76)	(1.30)	(11.90)	(6.05)	(4.85)
Δ_NPL	0.07***	−0.02	−0.05*	0.08***	0.02	0.01
	(3.16)	(−0.90)	(−1.90)	(4.59)	(0.82)	(0.74)
Loans	0.02	0.25	0.60**	0.10	0.13	0.18
	(0.13)	(1.60)	(2.10)	(0.88)	(0.82)	(0.79)
Country-year FE	NO	YES	YES	NO	YES	YES
Firm FE	NO	NO	YES	NO	NO	YES
R^2	0.462	0.819	0.921	0.393	0.814	0.913
N	594	548	546	637	615	614

Panel B. Earnings management

	Dependent variable: *Discretionary_LLP*					
	X=n.a.		*X=Above_Median*		*X=Top_Quartile*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
Independent Variables:	(1)	(2)	(3)	(4)	(5)	(6)
*Earnings_BTP*Treated*	0.03	−0.12***	0.01	−0.27	0.03	−0.11
	(0.67)	(−3.50)	(0.07)	(−1.45)	(0.43)	(−1.30)
*Earnings_BTP*X*Treated*			0.06	0.15	−0.04	0.00
			(0.43)	(0.78)	(−0.30)	(0.02)
Earnings_BTP	0.52***	0.42***	0.51***	0.36***	0.52***	0.34***
	(14.75)	(13.02)	(9.35)	(5.32)	(11.16)	(6.49)
Treated	−0.08	0.29	−0.07	0.45	−0.09	0.31
	(−0.65)	(1.29)	(−0.46)	(1.41)	(−0.65)	(1.00)
X			0.05	−0.17	−0.29	−0.16
			(0.52)	(−1.48)	(−1.53)	(−0.95)
*Earnings_BTP*X*			−0.01	0.09	0.11	0.12*
			(−0.08)	(1.21)	(1.21)	(1.68)
*X *Treated*			−0.12	−0.08	0.11	−0.05
			(−0.57)	(−0.43)	(0.38)	(−0.20)
*Capital_Total (t-1)*Treated*	0.35	−1.55	0.45	−1.87	0.38	−1.73
	(0.48)	(−1.43)	(0.66)	(−1.55)	(0.55)	(−1.37)
Capital_Total (t-1)	−0.69	1.03	−0.76*	0.61	−0.76	0.62
	(−1.22)	(1.43)	(−1.29)	(0.87)	(−1.35)	(0.85)
LLA (t-1)	0.02	0.03	0.02	0.03	0.02	0.03
	(1.37)	(0.66)	(1.25)	(0.71)	(1.28)	(0.76)
Log(Assets)	−0.03	0.37***	−0.03	0.37**	−0.03	0.35**
	(−0.43)	(2.63)	(−0.40)	(2.47)	(−0.50)	(2.37)
Securities	0.29*	0.29	0.31*	0.29	0.32*	0.23
	(1.75)	(0.85)	(1.91)	(0.81)	(1.95)	(0.64)

Controls	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.970	0.929	0.970	0.932	0.971	0.930
N	507	518	507	516	507	515

Panel C. Capital requirements management

	Dependent variable: *DLLP*							
	Y=Capital_ Total		*Y=Capital_ Tier1*		*Y=Excess_Capital_Total*		*Y=Excess_Capital_Tier1*	
Independent Variables:	*Lower* (1)	*Higher* (2)	*Lower* (3)	*Higher* (4)	*Lower* (5)	*Higher* (6)	*Lower* (7)	*Higher* (8)
*Y(t-1)*Treated*	0.32	−1.55	1.11	−2.18*	0.32	−1.55	1.15	−2.09*
	(0.48)	(−1.43)	(1.56)	(−1.82)	(0.48)	(−1.43)	(1.62)	(−1.79)
Y(t-1)	−0.69	1.03	−0.79	0.48	−0.69	1.03	−0.83	0.34
	(−1.22)	(1.43)	(−1.41)	(0.56)	(−1.22)	(1.43)	(−1.48)	(0.41)
*Earnings_BTP*Treated*	0.03	−0.12***	0.03	−0.11***	0.03	−0.12***	0.03	−0.11***
	(0.67)	(−3.50)	(0.64)	(−3.08)	(0.67)	(−3.50)	(0.64)	(−3.09)
Earnings_BTP	0.52***	0.42***	0.53***	0.43***	0.52***	0.42***	0.53***	0.42***
	(14.75)	(13.02)	(13.62)	(12.25)	(14.75)	(13.02)	(13.63)	(12.15)
Treated	−0.08	0.29	−0.16	0.36	−0.06	0.16	−0.10	0.22
	(−0.65)	(1.29)	(−1.32)	(1.55)	(−0.61)	(1.15)	(−1.00)	(1.37)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.970	0.929	0.971	0.929	0.970	0.929	0.971	0.930
N	507	518	440	510	507	518	440	511

Table 6. Market reaction to "day-one Impact" disclosures

This table presents an analysis of market reaction to disclosures of the "day-one impact" of IFRS 9. The dependent variables *Return, Δ_CDS, Δ_Bidask,* are calculated using a window of (−5, +5) days around the "day-one impact" disclosure (see Appendix A for specific variable definitions). *Day1_Impact* is defined as $(LLA_{IFRS9} - LLA_{IAS39})/LLA_{IAS39}$, where LLA_{IFRS9} is loan loss allowance under IFRS 9 and LLA_{IAS39} is loan loss allowance under IAS 39, both corresponding to the same reporting period. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* in the year corresponding to the reported provisions (*Δ_Credit_Risk* is defined as the % change in the average spread of the five-year sovereign CDS of the country). The independent variables are measured at the start of the year. The sample includes a cross-section of 178 observations corresponding to sample banks that disclosed the "day-one impact" of IFRS 9. Standard errors are robust to heteroscedasticity. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable:					
	Return		*Δ_CDS*		*Δ_Bidask*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
Independent Variables:	(1)	(2)	(3)	(4)	(5)	(6)
Day1_Impact	1.71	−5.13**	0.35	6.05*	0.40	0.75**
	(0.83)	(−4.10)	(0.11)	(1.85)	(1.59)	(2.34)
Controls:						
LLA	0.63**	0.29	−0.68***	0.55	0.06**	−0.02
	(3.56)	(0.99)	(−5.20)	(0.65)	(2.58)	(−0.57)
Past_Return	1.35	−6.01**	21.28***	−7.17	−0.43	0.11
	(0.38)	(−2.15)	(3.55)	(−1.57)	(−1.32)	(0.63)
Size	0.57	−0.34	−0.72	−0.17	−0.04	−0.06
	(1.52)	(−1.12)	(−1.32)	(−0.216)	(−0.76)	(−1.10)
BM	−0.48	−2.13	0.45	2.81	−0.45***	0.01
	(−0.50)	(−1.53)	(0.54)	(1.02)	(−3.61)	(0.14)
Δ_GDP	1.22***	−0.30	1.27***	2.74**	0.03	0.07**
	(4.58)	(−1.16)	(4.27)	(2.11)	(1.01)	(2.920)
R^2	0.334	0.177	0.902	0.475	0.236	0.300
N	79	80	29	46	83	79

Table 7. Loan loss allowance

This table presents an analysis of the effect of IFRS 9 on the level of loan loss allowances. The dependent variables measure the change in loan loss allowances in year t. *Δ_LLA_A* is the change in loan loss allowances divided by total assets, in %. *Δ_LLA_%* is the % change in loan loss allowances. *Higher_Credit_Risk* is an indicator variable that equals one if *Δ_Credit_Risk* is above the sample median, and zero otherwise (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable:	
	Δ_LLA_A	*Δ_LLA_%*
Independent Variables:	(1)	(2)
*Higher_Credit_Risk*Treated*	0.12*	10.58***
	(1.73)	(2.90)
Higher_Credit_Risk	0.01	0.88
	(0.63)	(0.98)
Treated	0.02	−2.20
	(0.35)	(−0.83)
Controls:		
Log(Assets)	−0.10	7.67
	(−0.91)	(1.47)
Net_Interest_Income	0.01	−0.79
	(0.20)	(−0.41)
NPL	0.06***	0.63
	(3.44)	(1.58)
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.448	0.574
N	1,149	1,181

Table 8. Lending

This table presents an analysis of the effect of IFRS 9 on lending. The dependent variables measure change in total loans outstanding in year t. *Δ_Loans_A* is the change in total loans outstanding divided by total assets in %. *Δ_Loans _%* is the % change in total loans outstanding. Panel A presents results of the one-step estimation where *Higher_Credit_Risk* is an indicator variable that equals one if *Δ_Credit_Risk* is above the sample median, and zero otherwise (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. Panel B presents results of the two-step estimation where $\widehat{\Delta\_LLA}$ in model 1 (model 2) is the predicted value from model 1 (model 2) in Table 7 (i.e., regressions explaining changes in loan loss allowances based on the interaction between *Higher_Credit_Risk* and *Treated*). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

Panel A. One-step estimation

	Dependent variable:	
	Δ_Loans_A	*Δ_Loans_%*
Independent Variables:	(1)	(2)
*Higher_Credit_Risk*Treated*	−1.80***	−3.50***
	(−3.06)	(−2.63)
Higher_Credit_Risk	−0.29	1.22***
	(−1.52)	(2.68)
Treated	−0.56	−0.09
	(−0.97)	(−0.08)
Controls:		
Δ_LLA	1.22***	0.10***
	(4.92)	(5.20)
Size_Assets	0.03	2.61
	(0.03)	(1.06)
Net_Interest_Income	−0.34	−3.94***
	(−0.55)	(−3.02)
NPL	−0.05	−0.24**
	(−1.04)	(−2.07)
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.322	0.609
N	1,177	1,177

Panel B. Two-step estimation

	Dependent variable:	
	Δ_Loans_A	*Δ_Loans_%*
Independent Variables:	(1)	(2)
$\widehat{\Delta\_LLA}$	−7.70***	−0.17
	(−3.46)	(−1.60)
Controls	YES	YES
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.271	0.586
N	1,171	1,177

Table 9. Capital ratios

This table presents an analysis of the effect of IFRS 9 on capital ratios. The dependent variables measure change in capital ratios in year t. *Δ_Capital_Total* is the change in the Total Capital Ratio in % of the risk-weighted assets. *Δ_Capital_Tier1* is the change in Tier 1 Capital ratio in % of the risk-weighted assets. Panel A presents results of the one-step estimation where *Higher_Credit_Risk* is an indicator variable that equals one if *Δ_Credit_Risk* is above the sample median, and zero otherwise (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. Panel B presents results of the two-step estimation where $\widehat{\Delta\_LLA}$ in model 1 (model 2) is the predicted value from model 1 (model 2) in Table 7 (i.e., regressions explaining changes in LLA based on the interaction between *Δ_High_Credit_Risk* and *Treated*). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

Panel A. One-step estimation

	Dependent variable:	
	Δ_Capital_Total	*Δ_Capital_Tier1*
Independent Variables:	(1)	(2)
*Higher_Credit_Risk*Treated*	0.16	0.08
	(0.69)	(0.42)
Higher_Credit_Risk	−0.05	−0.11
	(−0.64)	(−1.48)
Treated	0.04	−0.05
	(0.22)	(−0.30)
Controls:		
Δ_LLA	0.12	0.13*
	(1.29)	(1.89)
Log(Assets)	0.14	0.27
	(0.38)	(0.68)
Net_Interest_Income	0.51**	0.55***
	(2.48)	(2.98)
NPL	0.02	0.02
	(0.96)	(0.73)
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.251	0.274
N	1,092	1,012

Panel B. Two-step estimation

	Dependent variable:	
	Δ_Capital_Total	*Δ_Capital_Tier1*
Independent Variables:	(1)	(2)
$\widehat{\Delta\_LLA}$	0.15	0.03
	(0.16)	(0.03)
Controls	YES	YES
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.229	0.267
N	1,095	1,014

Switching From Incurred to Expected Loan Loss Provisioning: Early Evidence

Online Appendices

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Appendix OA. COVID-19 infections and spreads of sovereign CDS

This appendix presents a regression analysis of the relationship between the number of newly confirmed COVID-19 cases and Sovereign CDS spreads. We collect daily data on COVID-19 cases from WHO's Situation Reports up to April 29, 2020.[30] Sovereign CDS data are taken from Capital IQ. MSCI AC World Index (local currency) data is taken from Datastream. The sample includes a panel of 547 observations, covering eight countries which are on the list of 10 largest numbers of confirmed COVID-19 cases as of April 29, 2020 (US, Spain, Italy, UK, Germany, France, Russia, China) and with investment grade for the long-term foreign currency rating from S&P.

The results in Table OA reveal a positive and significant association between sovereign CDS spreads and the number of COVID-19 cases. The association weakens after government intervention and once the growth in the number of cases diminishes in the sample countries. These results suggest that our results from partitioning the sample based on changes in sovereign CDS spreads can shed light on the effect of IFRS 9 in the context of the pandemic.

Table OA. Regression results

The dependent variable, *CDS_Spread*, is the daily change in the spread of the five-year sovereign CDS of the country (in bp). *N_COVID* is the number of newly confirmed COVID-19 cases on that day (in thousands). *Early_Period* is an indicator variable that equals one if the date is between February 22, 2020 (Italy announces the lockdown of part of Lombardy) and March 18, 2020 (the ECB announces the introduction of the Pandemic Emergency Purchase Program). *MSCIWorld* is the daily return in MSCI AC World index (local currency). Standard errors are clustered by day and *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent Variable: *CDS_Spread*		
Indep. Variables:	(2)	(3)	(4)
N_COVID Early_Period*	3.63**	3.64**	3.63**
	(2.36)	(2.36)	(2.22)
N_COVID	0.03	0.06	0.05
	(1.28)	(1.45)	(1.23)
Early_Period	0.77	0.84	0.77
	(0.72)	(0.79)	(0.80)
MSCIWorld	−1.44***	−1.44***	−1.42***
	(−6.89)	(−6.83)	(−7.17)
Country fixed effects	NO	YES	YES
Week fixed effects	NO	NO	YES
Adj-R^2	0.153	0.240	0.257
N	576	576	576

[30] https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports

Appendix OB. Regulatory developments on loan loss provisioning

Date	Institution	Development	Description
March 2008	IASB	Discussion paper: Reducing Complexity in Reporting Financial Instruments.	This discussion paper was designed to gather information to assist the IASB and FASB boards in deciding how to proceed in developing a new standard that is principle-based and less complex than requirements in IAS 39. https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FProject%20Documents%2F90%2FDPReducingComplexityReportingFinancialInstruments.pdf
April 2009	G20	The G20 calls on FASB and IASB to improve accounting standards on valuation and impairment.	http://www.g20.utoronto.ca/2009/2009progressreport1107.pdf
July 2009	IASB	Exposure Draft ED/2009/7 "Financial Instruments: Classification and Measurement"	A financial asset or financial liability would be measured at amortized cost if the instrument has loan characteristics and the instrument is managed on a contractual yield basis. Financial assets or liabilities that do not meet both conditions will be measured at fair value. https://www.iasplus.com/en/binary/pressrel/0907financialinstrumentsed.pdf
July 2009	FCAG	The Financial Crisis Advisory Group (FCAG) urges the IASB and FASB to achieve converged standards in accordance with the Memorandum of Understanding between the Boards signed in 2006.	https://www.ifrs.org/-/media/feature/groups/consultative-groups/fcag/report-of-the-fcag.pdf
Nov.2009	IASB	Exposure Draft ED/2009/12 "Financial Instruments: Amortized Cost and Impairment"	i) Amends IAS 39 to modify the way credit losses are recognized on financial assets measured at amortized cost ii) Mandates the recognition the relationship between the pricing of the loan and the expected credit losses. Interest adjusted to take into account expected credit losses is recognized as gains and losses. https://www.asc.gov.sg/Portals/0/attachments/Consultations/edfiimpairmentnov09_191.pdf
May 2010	FASB	Exposure Draft "Accounting for Financial Instruments and Revisions to the Accounting for Derivative Instruments and Hedging Activities"	Mandates that all expected credit losses be recognized immediately. https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176156904144&acceptedDisclaimer=true
January 2011	IASB and FASB	IASB and FASB issue supplementary documents. "Supplement to ED/2009/12 Financial Instruments: Amortized Cost and Impairment" (IASB) "Supplementary Document. Accounting for Financial Instruments and Revisions to the Accounting for Derivative Instruments and Hedging Activities: Impairment" (FASB)	i) The amendments reduce differences in the standards on impairment ii) Both standard-setters introduce the 'Good-book/bad-book' approach. https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176158188929&acceptedDisclaimer=true

			https://www.fondazioneoic.eu/wp-content/uploads/downloads/2011/02/2011-01-Supplementary-doc-Financial-Instruments-Impairment.pdf
Dec. 2012	FASB	Exposure Draft: "Financial Instruments—Credit Losses (Subtopic 825-15)"	i) Introduces the Current Expected Credit Loss (CECL) model where banks should recognize lifetime expected credit losses. ii) It does not adopt the 3-stage classification of IFRS 9. https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176160587228&acceptedDisclaimer=true
March 2013	IASB	Exposure Draft ED/2013/3 "Financial Instruments: Expected Credit Losses"	Exposure Draft proposes that 12-month expected credit losses should be recognized for financial instruments that have not deteriorated significantly in credit quality since initial recognition or that have low credit risk at the reporting date and lifetime expected credit losses should be recognized for those financial instruments that have deteriorated significantly in credit quality since initial recognition. https://www.asc.gov.sg/Portals/0/attachments/Consultations/2013/ED-Financial-Instruments-Expected-Credit-Losses-March-2013.pdf
July 2014	IASB	IFRS 9: "Financial Instruments"	Clarifies and simplifies the model to address the concerns expressed in the comment letters received. Single classification and measurement approach reflecting the business model in which financial instruments are managed and their cash flow characteristics. This standard contains a single forward-looking expected credit loss model that is applicable to all financial instruments subject to impairment accounting. https://www.ifrs.org/-/media/project/financial-instruments/project-summaries/ifrs-9-project-summary-july-2014.pdf
June 2016	FASB	ASU 2016-13 "Financial instruments—credit losses (topic 326): Measurement of credit losses on financial instruments".	For public business entities that meet the definition of SEC filer, ASU 2016-13 is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. For all other entities it is effective for fiscal years beginning after December 15, 2022, including interim periods within those fiscal years. https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176168232528&acceptedDisclaimer=true
Nov. 2016	EU	The European Union endorses IFRS 9 for mandatory application from 1 January 2018 onwards.	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:323:FULL&from=EN

Appendix OC. Modified version of the example in Appendix B

This appendix presents a modified version of the analysis in the example of Appendix B. We consider the same loan as in Appendix B, the same macroeconomic scenarios, and the same evolution of the loan over years 1, 2, and 3. In contrast to Appendix B, this appendix takes into account the effective interest rate (2.5%) and the cumulative lifetime and marginal probability of default. Also more realistically than in Appendix B, we consider that LGD decreases over time (LGD is 58.20% in year 1, 50.20% in year 2, and 48.50% in year 3). Thus, the alternative computations of LLA under IFRS 9, IAS 39, and ASU 2016-13 (i.e., CECL in the US) are as follows.

LLA according to IFRS 9

Year 1:

The computation of LLA discounts by the interest rate (2.5%) and considers the interest gains of the loan to compute EAD (EAD = 450,000*(1+0.025) = 461,250). As such,

$$\text{LLA}=\frac{\text{EADxPDxLGD}}{(1+0.025)}=\frac{461{,}250*\left(\frac{0.035}{100}\right)*\left(\frac{58.2}{100}\right)}{(1+0.025)} = 91 \text{ euros}$$

Year 2:

The LLA is computed as the lifetime expected credit loss of the loan taking into account annual variability in the probability of default over the nine remaining years. In particular:

$$\text{LLA}= \textit{Lifetime } ECL_t=\sum_{t=1}^{9} Marginal\ ECL_t$$

where,

$$\textit{Marginal } ECL_t=\frac{EAD_t\ x\ Marginal\ PD_t\ x\ (1-Cumulative\ EE_{t-1})\ x\ LGD_t}{(1+i)^m},$$

and

$$\textit{Marginal } PD_t= \frac{Cumulative\ PD_t-Cumulative\ PD_{t-1}}{(1-Cumulative\ PD_{t-1})}$$

$Cumulative\ EE_{t-1} = 0.7 * Cumulative\ PD_{t-1}$. This is the cumulative probability of "early exit" (EE), which is computed assuming a 70% probability that loans are "cured" after being in default in the previous years (i.e., the payments resume). The computation of the marginal PD reflects a conditional probability (the condition is that the loan has not defaulted before year t).

Thus, the computation of the lifetime ECL (i.e., the LLA) is as follows (cumulative PD are based on historical data for similar loans and, from 2021 on, EAD considers the interest gains of the loan, namely 425,000*(1+0.025) = 435,625):

Year	EAD (€)	Cumulative PD	Marginal PD	Cumulative EE_{t-1}	LGD	Discount rate	Marginal ECL (€)
2020	425,000						
2021	435,625	0.072%	0.072%	0.000%	50.20%	2.50%	154
2022	435,625	0.993%	0.922%	0.050%	50.20%	2.50%	1,918
2023	435,625	1.544%	0.556%	0.695%	50.20%	2.50%	1,122
2024	435,625	3.064%	1.543%	1.081%	50.20%	2.50%	3,026
2025	435,625	5.234%	2.238%	2.145%	50.20%	2.50%	4,234
2026	435,625	7.600%	2.496%	3.664%	50.20%	2.50%	4,535
2027	435,625	9.994%	2.591%	5.320%	50.20%	2.50%	4,514
2028	435,625	12.323%	2.587%	6.996%	50.20%	2.50%	4,319
2029	435,625	15.002%	3.055%	8.626%	50.20%	2.50%	4,888
						Lifetime ECL (LLA):	28,710

Year 3:

LLA is computed as the EAD minus the proceeds from selling the non-performing loan. The computation considers the interest gains of the loan to compute EAD (EAD = 407,000*(1+0.025) = 417,000). The LGD (taking into

account the selling discount) is 48.50%. The time to recovery is 18 months.[31] Recall that PD =1 (it is stage 3). Thus, the computation of the LLA is as follows:

$$\text{LLA}=417{,}000-\frac{(1-0.4850)*417{,}000}{(1+0.025)^{18/12}}=210{,}054$$[32]

The second term reflects the present value of the proceeds from selling the non-performing loan. Note that (1-0.4850)*417,000 is the price at which the loan would be sold. The discounting reflects that the recovery is 18 months, namely 1.5 (18/12) years.

LLA according to IAS 39

Year 1: LLA=0 (as in Appendix B)
Year 2: LLA=0 (as in Appendix B)
Year 3: $\text{LLA}=417{,}000-\frac{(1-0.4850)*417{,}000}{(1+0.025)^{18/12}}=210{,}054$ euros (as in IFRS 9)

LLA according to ASU 2016-13 (US CECL)

Year 1:

The US standard requires the computation of the lifetime ECL (i.e., the LLA). In this case (EAD from 2020 on considers the interest gains of the loan, namely 450,000*(1+0.025) = 461,250).

Year	EAD (€)	Cumulative PD	Marginal PD	Cumulative EE_{t-1}	LGD	Discount rate	Marginal ECL (€)
2019	450,000						
2020	461,250	0.035%	0.035%	0.000%	58.20%	2.50%	91
2021	461,250	0.093%	0.059%	0.024%	58.20%	2.50%	150
2022	461,250	0.163%	0.070%	0.065%	58.20%	2.50%	174
2023	461,250	0.279%	0.116%	0.114%	58.20%	2.50%	282
2024	461,250	0.362%	0.083%	0.195%	58.20%	2.50%	197
2025	461,250	0.463%	0.102%	0.254%	58.20%	2.50%	234
2026	461,250	0.553%	0.090%	0.324%	58.20%	2.50%	203
2027	461,250	0.652%	0.099%	0.387%	58.20%	2.50%	218
2028	461,250	0.754%	0.103%	0.456%	58.20%	2.50%	220
2029	461,250	0.873%	0.120%	0.528%	58.20%	2.50%	250
						Lifetime ECL (LLA):	2,020

Year 2: LLA is the same as in IFRS 9 (as in Appendix B), namely LLA = 28,710
Year 3: LLA is the same as in IFRS 9 (as in Appendix B), namely LLA = 210,054

Annual Loan Loss Provision (LLP)

Year	IFRS 9	IAS 39	US CECL
2019	91	0	2,020
2020	28,710-91=28,619	0	28,710-2,020=26,690
2021	210,054-28,710=181,344	210,054	210,054-28,710=181,344

Last remark: Banks often evaluate whether there is a significant increase in credit risk by comparing the annualized lifetime PD at reporting date with that at origination. In this case, the annualized lifetime PD is 0.087% at origination (year 1) and 1.790% in year 2.[33] That is, in year 2 the annualized lifetime PD is more than 20 times larger, suggesting that the switch to stage 2 is justified.

[31] The time to recovery is defined as the cash-flow weighted average period between default and cash-flow.
[32] Note that the LLA in stage 3 in Appendix B can be expressed as LLA=EAD*(PD=1)*LGD = EAD - (1-LGD)*EAD. This second term reflects the undiscounted proceeds from selling the non-performing loan (assuming this is the way to liquidate the loan). The LLA computation in this appendix discounts this second term.
[33] Year 1: annualized lifetime PD= $1-(1-0.0087)^{1/10}=0.00087$ (0.0087 is the cumulative PD in 2029 estimated in 2019).
Year 2: annualized lifetime PD= $1-(1-0.150)^{1/9}=0.01790$ (0.150 is the cumulative PD in 2029 estimated in 2020).

Appendix OD. The ECL model and the COVID-19 crisis: Regulatory responses

This appendix includes the main events relating to how bank regulators and supervisors, accounting regulators, and legislators have dealt with the implementation of the ECL model in the COVID-19 crisis.

Date	Event
20 March, 2020	The European Central Bank (ECB) provides flexibility to banks in response to the coronavirus crisis. The ECB gives banks further flexibility in prudential treatment of loans backed by public support measures, encourages banks to avoid excessive procyclical effects derived from IFRS 9, and activates capital and operational relief measures to increase the ability of banks to absorb losses or to increase the banks' lending. The ECB also introduces relief measures regarding asset quality deterioration and non-performing loans, operational aspects of supervision, and capital and liquidity requirements. Sources: https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr200320~4cdbbcf466.en.html https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr200320_FAQs~a4ac38e3ef.en.html
22 March, 2020	The Federal Deposit Corporation (FDIC), the Board of Governors of the Federal Reserve System (FRB), the Office of the Comptroller of the Currency, the National Credit Union Administration, the state banking regulators, and the Consumer Financial Protection Bureau issue the *"Interagency Statement on Loan Modifications and Reporting by Financial Institutions Working with Customers Affected by the Coronavirus"* to encourage financial institutions to work constructively with borrowers affected by COVID-19. The FDIC states that the agency will not criticize institutions for prudent loan modifications and will not direct supervised institutions to automatically categorize COVID-19-related loan modifications as troubled debt restructurings (TDRs). The agency also allows short-term modifications made on a good faith basis in response to COVID-19 to borrowers who were current prior to any relief are not considered TDRs. Prudent loan modifications are viewed by the FDIC as positive actions that can effectively manage or mitigate adverse impacts on borrowers due to the coronavirus. The guidance was developed in consultation with the staff of FASB, who concurred with this approach. The interagency statement also provided supervisory views on regulatory reporting of past due and nonaccrual status for loan modification programs. Sources: https://www.fdic.gov/news/news/financial/2020/fil20022.html, https://www.fasb.org/cs/Satellite?c=FASBContent_C&cid=1176174374016&d=Touch&pagename=FASB%2FFASBContent_C%2FNewsPage
27 March, 2020	The Coronavirus Aid, Relief, and Economic Security Act (CARES Act) is signed into law. The CARES Act provides banking organizations optional temporary relief from complying with CECL (statutory relief). Source: https://www.congress.gov/bill/116th-congress/house-bill/748/text
27 March, 2020	The Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency issue an interim final rule (IFR) that delays the estimated impact on regulatory capital stemming from the implementation of CECL (ASU 2016-13) for a transition period of up to five years. Sources: https://www.fdic.gov/news/news/financial/2020/fil20032a.pdf
27 March, 2020	The International Accounting Standards Board (IASB) recommends that entities develop their own estimates based on the best available information and that entities take into account the effects of COVID-19 and the significant government support measures being undertaken in order to develop their forecast conditions. IASB also encourages entities to consider the guidance issued by prudential and securities regulators (including the European Banking Authority, the European Central Bank, the European Securities and Market Authority, the Prudential Regulation Authority, and the Malaysian Accounting Standards Board). Source: https://cdn.ifrs.org/-/media/feature/supporting-implementation/ifrs-9/ifrs-9-ecl-and-coronavirus.pdf?la=en
27 March, 2020	The Basel Committee's oversight body, the Group of Central Bank Governors and Heads of Supervision (GHOS), announces the deferral of Basel III implementation to increase operational capacity of banks and supervisors to respond to the COVID-19 crisis. Source: https://www.bis.org/press/p200327.htm
1 April, 2020	Andrea Enria, Chair of the Supervisory Board of the EU's Single Supervisory Mechanism (SSM), sends a letter to significant European banks providing further guidance on the collective assessment of the significant increase in credit risk thresholds, the use of long-term macroeconomic forecasts, and the use of macroeconomic forecasts for specific years. This guidance is developed to avoid excessive procyclical effects of IFRS 9 during the COVID-19 crisis. Source: https://www.bankingsupervision.europa.eu/press/letterstobanks/shared/pdf/2020/ssm.2020_letter_IFRS_9_in_the_context_of_the_coronavirus_COVID-19_pandemic.en.pdf
3 April, 2020	The Basel Committee on Banking Supervision issues a document about the measures to reflect the impact of COVID-19. The Committee agrees that the risk-reducing effects of the extraordinary support measures taken by governments should be fully recognized in risk-based capital requirements and also on the expected credit losses calculated by banks. The Committee also agreed on making amendments to the existing transitional arrangements for the regulatory capital treatment of expected credit losses. Source: https://www.bis.org/bcbs/publ/d498.pdf

Appendix OE. IFRS 9 implementation by country

Country	Date of Adoption	Status	Note	Link
Argentina	1/1/2020	Implemented	IFRS 9 except for impairment rules went into effect on 1 Jan 2018.	https://www.bcra.gob.ar/Pdfs/comytexord/A6847.pdf
Australia	1/1/2018	Implemented	One bank adopted early in Oct 2014 (NAB).	https://www.apra.gov.au/sites/default/files/letter_to_adis_provisions_for_regulatory_purposes_and_aasb_9_financial_instruments.pdf
Austria	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Bahrain	1/1/2018	Implemented	Some banks were early adopters of IFRS 9 (SAL on 01/01/2017 and BBK in 2016).	https://cbb.complinet.com/net_file_store/new_rulebooks/e/d/EDBS_KH_Guidelines_for_IFRS9_ECL_Implementation_by_Banks_and_Financing_Companies_28_December_2016.pdf
Bangladesh		TBD	Banks use local version of LLP model, not exactly consistent with ECL.	https://fid.portal.gov.bd/sites/default/files/files/fid.portal.gov.bd/page/7836838f_51fd_4d72_a1c4_f1e4a029447f/5.%20Credit%20Management%20and%20Policies.pdf
Belgium	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Botswana	1/1/2018	Implemented		https://www.bankofbotswana.bw/sites/default/files/publications/Banking_Supervision_Annual_Report_2018.pdf
Brazil		TBD	Banks comply with local LLP model, but some of them publish IFRS-based statements as well.	http://www.cpc.org.br/CPC/Documentos-Emitidos/Pronunciamentos/Pronunciamento?Id=106
Bulgaria	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Canada	1/1/2018	Implemented	Major banks adopted on 1 Nov 2017, some regional banks on 1 Nov 2018.	https://www.osfi-bsif.gc.ca/Eng/fi-if/rg-ro/gdn-ort/gl-ld/Pages/ifrs9_let.aspx
Chile		TBD	Banks use local version of LLP model, which is not exactly consistent with ECL.	https://www.sbif.cl/sbifweb/internet/docs/Normas/20190123-CNC-Bancos-Consulta.pdf
China	1/1/2018	Implemented	Banks listed on/offshore or offshore only adopted on 1/1/2018, those listed onshore only on 1/1/2019.	http://www.pbc.gov.cn/english/130736/3729741/index.html
Colombia	1/1/2018	Implemented		http://suin.gov.co/viewDocument.asp?id=30030359
Costa Rica		TBD		https://www.sugef.fi.cr/normativa/normativa_vigente/SUGEF%2030-18%20(v_2%20oct%202018)%20publicacion%20La%20Gaceta.pdf
Croatia	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Cyprus	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Czech Republic	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Denmark	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Egypt	1/1/2019	Implemented		https://www.cbe.org.eg/en/BankingSupervision/Pages/Circulars.aspx
Estonia	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Finland	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
France	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Germany	1/1/2018	Implemented	Some banks (i.e., Umweltbank) adopted local version of ECL on 1 Jan 2018.	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Ghana	1/1/2018	Implemented		https://www.bog.gov.gh/wp-content/uploads/2019/07/KEYNOTE-ADDRESS-BY-DR.-ERNEST-ADDISON-GOVERNOR-AT-THE-GHANA-CEO-SUMMIT.pdf
Greece	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Hong Kong	1/1/2018	Implemented		https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/basel-3/CP_17_02_HKFRS9.pdf
Hungary	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Iceland	1/1/2018	Implemented		https://www.cb.is/library/Skraarsafn---EN/Financial-Stability-Report/2018-1/Financial_Stability_2018_1.pdf

India		TBD		https://rbidocs.rbi.org.in/rdocs/notification/PDFs/NT146F6A26AD4C30C4ED984F0AE5500CDDF72.PDF
Indonesia	1/1/2020	Implemented		https://www.ojk.go.id/id/kanal/perbankan/Pages/Pedoman-Akuntansi-Perbankan-Indonesia-(PAPI).aspx
Iraq	1/1/2019	Implemented		https://cbi.iq/static/uploads/up/file-156448203149840.pdf
Ireland	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Israel	1/1/2021	Scheduled	Banks will be required to adopt CECL.	https://www.boi.org.il/en/BankingSupervision/LettersAndCircularsSupervisorOfBanks/LettersOfTheBankingSupervisionDepartment/201805en.pdf
Italy	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Ivory Coast / Cote d'Ivoire		TBD	BCEAO's rule adopted on 1 Jan 2018 is not consistent with ECL in IFRS 9, some banks adopted ECL.	https://www.bceao.int/sites/default/files/2017-11/instruction_no_026-11-2016_-_relative_a_la_comptabilisation_et_a_l_evaluation_des_engagements_en_souffrance.pdf
Japan		TBD	Banks use a local version of LLP model.	https://www.boj.or.jp/research/wps_rev/rev_2019/rev19j09.htm/
Jordan	1/1/2018	Implemented		http://www.cbj.gov.jo/EchoBusv3.0/SystemAssets/PDFs/EN/JFSR2018E%20-20-10-2019.pdf
Kazakhstan	1/1/2019	Implemented	Some banks early adopted ECL as of 1 Jan 2018.	http://www.minfin.gov.kz/irj/go/km/docs/documents/%D0%9C%D0%B8%D0%BD%D1%84%D0%B8%D0%BD_new/%D0%A1%D0%BE%D0%B1%D1%8B%D1%82%D0%B8%D1%8F/%D0%9D%D0%BE%D0%B2%D0%BE%D1%81%D1%82%D0%B8/kz/00586b5d-45d1-3610-6998-947b8ca8eb53.xml
Kenya	1/1/2018	Implemented		https://www.centralbank.go.ke/wp-content/uploads/2018/04/CBK-Guidance-Note-on-Implementation-of-IFRS-9.pdf
Kuwait	1/1/2018	Implemented	Banks are required to report LLP under the CBK rules or IFRS-9 standards, whichever is greater.	https://www.cbk.gov.kw/en/redirects/download?compId=143640&esIndex=reports
Lebanon	1/1/2018	Implemented		http://www.bccl.gov.lb/pdf_files/regulations/bccl_memos/BCCL%20Memo%20No%2018_2015.pdf
Lithuania	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Malawi	1/1/2018	Implemented		https://www.rbm.mw/FinancialStability/FinancialStabilityReports/
Malaysia	1/1/2018	Implemented		https://www.bnm.gov.my/index.php?ch=57&pg=140&ac=96&bb=file
Malta	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Mauritius	1/1/2018	Implemented		https://www.bom.mu/media/speeches/keynote-address-mr-yandraduth-googoolye-governor-bank-mauritius-seminar-international-financial
Mexico	1/1/2021	Scheduled		https://www.dof.gob.mx/nota_detalle.php?codigo=5577632&fecha=04/11/2019
Morocco	1/1/2018	Implemented		https://www.imf.org/~/media/Files/Publications/CR/2019/1MAREA2019003.ashx
Namibia	1/1/2018	Implemented		https://www.bon.com.na/CMSTemplates/Bon/Files/bon.com.na/7c/7c8d9d1a-0cad-4745-ab1b-61991ab32781.pdf
Netherlands	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
NZ	1/1/2018	Implemented		https://www.fma.govt.nz/compliance/financial-reporting/faqs/#newaccountingstandards
Nigeria	1/1/2018	Implemented		https://www.cbn.gov.ng/out/2018/bsd/circular%20on%20transitional%20arrangement%20treatment%20of%20ifrs%209%20dated%20october%2018,%20%202018.pdf
North Macedonia	1/1/2018	Implemented		http://www.nbrm.mk/ns-newsarticle-soopstenie-na-nbrm-22062017-en.nspx
Norway	1/1/2018	Implemented	Some banks are following local GAAP and have not adopted ECL yet.	https://www.finanstilsynet.no/en/news-archive/news/2016/public-statement-from-esma-regarding-ifrs-9/
Oman	1/1/2018	Implemented		https://cbo.gov.om/Pages/RegulatoryFramework.aspx
Pakistan	1/1/2021	Scheduled		http://www.sbp.org.pk/bprd/2019/C4.htm
Palestinian Territories	1/1/2018	Implemented		http://www.pma.ps/Portals/1/Users/002/02/2/Publications/English/Annual%20Reports/PMA%20Annual%20Reports/AR2017.pdf
Peru		TBD	Local supervisor (SBS) not adopted ECL yet.	https://intranet2.sbs.gob.pe/dv_int_cn/1786/v1.0/Adjuntos/2610-2018.pdf
Philippines	1/1/2018	Implemented		https://www.sec.gov.ph/wp-content/uploads/2017/10/2017MCno10.pdf

Poland	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Portugal	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Qatar	1/1/2018	Implemented		http://www.qcb.gov.qa/sitelists/circularstobanks/lists/circulars/attachments/149/circular%20no.%209-2017.pdf
Romania	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Russia	1/1/2018	Implemented		http://www.cbr.ru/collection/collection/file/7470/cbr_ir_100818.pdf
Rwanda	1/1/2018	Implemented		https://www.bnr.rw/laws-and-regulations/banking/directives-guidelines/?tx_bnrdocumentmanager_frontend%5Bdocument%5D=1015&tx_bnrdocumentmanager_frontend%5Baction%5D=download&tx_bnrdocumentmanager_frontend%5Bcontroller%5D=Document&cHash=d595eb975eb7172be01e2a22b426e25d
Saudi Arabia	1/1/2018	Implemented		http://www.sama.gov.sa/en-US/EconomicReports/Financial%20Stability%20Report/Financial%20Stability%20Report%202019.pdf
Serbia	1/1/2018	Implemented		https://www.nbs.rs/internet/english/55/55_10/index.html
Singapore	1/1/2018	Implemented		https://www.mas.gov.sg/~/media/MAS/News%20and%20Publications/Consultation%20Papers/CP%20on%20Proposed%20Amendments%20to%20Reg%20Rqmts_Credit%20Loss%20Provisioning.pdf
Slovenia	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
South Africa	1/1/2018	Implemented		https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8100/D5%20of%202017.pdf
South Korea	1/1/2018	Implemented		https://www.bok.or.kr/eng/bbs/E0000737/view.do?nttId=10046849&menuNo=400042&pageIndex=1
Spain	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Sri Lanka	1/1/2018	Implemented		https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/laws/cdg/bsd_circular_no_04_of_2018.pdf
Sweden	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
Switzerland	1/1/2020	Implemented	Local version of ECL model will go into effect on 1 Jan 2020, some banks chose to adopt earlier.	https://www.finma.ch/en/news/2019/11/20191114-mm-rechnungslegung/
Syria	1/1/2019	Implemented	Some banks adopted ECL as early as 1 January 2018.	http://www.cb.gov.sy/en/legislations-laws/single?id=fce0b9f67d
Taiwan	1/1/2018	Implemented		https://www.fsc.gov.tw/en/home.jsp?id=74&parentpath=0,2&mcustomize=multimessage_view.jsp&dataserno=201801110006&aplistdn=ou=bulletin,ou=multisite,ou=english,ou=ap_root,o=fsc,c=tw&dtable=Bulletin
Tanzania	1/1/2018	Implemented		https://www.bot.go.tz/Publications/Fin-stability/Financial%20Stability%20Report%20March%202018.pdf
Thailand	1/1/2020	Implemented		https://www.bot.or.th/Thai/ResearchAndPublications/articles/Pages/Article_06Nov2019.aspx
Togo		TBD	BCEAO's rule adopted on 1 Jan 2018 is not consistent with ECL in IFRS 9, some banks adopted ECL.	https://www.bceao.int/sites/default/files/2017-11/instruction_no_026-11-2016_-_relative_a_la_comptabilisation_et_a_l_evaluation_des_engagements_en_souffrance.pdf
Tunisia	1/1/2021	Scheduled		https://www.bct.gov.tn/bct/siteprod/documents/sup_bc_ang.pdf
Turkey	1/1/2018	Implemented		http://www.tcmb.gov.tr/wps/wcm/connect/f992598b-d50a-447d-80e3-7fff6a7ed6b1/sectionI-24.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-f992598b-d50a-447d-80e3-7fff6a7ed6b1-m3fw7Ap
Uganda	1/1/2018	Implemented		https://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/FinancialStability/financial_stability/Rpts/All/Financial-Stability-Report-June-2019-final-2.pdf
Ukraine	1/1/2018	Implemented		https://bank.gov.ua/news/all/finansovi-regulyatori-viznachili-prioriteti-reformi-na-nastupni-pivtora-roki
United Arab	1/1/2018	Implemented		https://www.centralbank.ae/sites/default/files/2018-11/FinancialStabilityReport2017_1.pdf

Emirates				
United Kingdom	1/1/2018	Implemented		https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R2067&from=EN
United States	12/15/2019	Implemented		https://www.fasb.org/creditlosses&pf=true
Venezuela		TBD		http://www.sudeban.gob.ve/wp-content/uploads/N_Prudenciales/1-CARTERA-DE-CREDITOS/1-15-RES-017-18.pdf
Vietnam		Beyond 2025		https://www.mof.gov.vn/webcenter/portal/tttc/r/l/cm1913?dDocName=MOFUCM150321&dID=156831
Zambia	1/1/2018	Implemented		https://www.boz.zm/CBCircularNo112017THEIMPLEMENTATIONOFTHEINTERNATIONALFINANCIALREPORTINGSTANDARD9FINANCIALINSTRUMENTSBYFINANCIALSERVICEPROVIDERS.pdf

Appendix OF. Additional analyses

This appendix contains analyses that are not included in the main body of the paper due to space limitations.

Table OF1. Reporting discretion, alternative sample periods

This table repeats the analysis in Table 5, Panel C for alternative lengths of the sample period. *Discretionary_LLP* is discretionary loan loss provisions in year t divided by total assets. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. *Earnings_BTP* is net income before tax and discretionary provisions in year t divided by total assets. *Capital* is the total capital adequacy ratio. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). "t-1" indicates that the variable is measured in the prior period. See Appendix A for detailed variable definitions. The sample includes a panel of firm-year observations for different sample period definitions using our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable: *Discretionary_LLP*													
Sample period:	*2017-2018*		*2015-2018*		*2013-2018*		*2011-2018*		*2009-2018*		*2007-2018*		*2005-2018*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
*Earnings_BTP*Treated*	0.00	−0.05	−0.06	−0.04	−0.02	−0.10***	−0.03	−0.12***	0.00	−0.12***	0.00	−0.11***	0.01	−0.10**
	(0.17)	(−0.80)	(−1.32)	(−1.01)	(−0.36)	(−2.85)	(−0.64)	(−3.12)	(0.05)	(−2.97)	(0.05)	(−2.71)	(0.34)	(−2.59)
*Capital(t-1)*Treated*	0.89***	−1.02	0.86*	−1.18	0.89	−2.00*	0.80	−1.41	0.76	−1.37	0.84	−1.18	0.88	−1.23
	(2.62)	(−1.16)	(1.65)	(−1.27)	(1.17)	(−1.76)	(1.10)	(−1.32)	(1.06)	(−1.28)	(1.19)	(−1.06)	(1.35)	(−1.11)
Main effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.995	0.975	0.982	0.952	0.964	0.922	0.959	0.910	0.956	0.912	0.944	0.903	0.942	0.899
N	180	192	353	404	502	597	654	776	794	954	905	1,089	979	1,196

Table OF2. Reporting discretion prior to adoption of ECL

This table presents an analysis of banks' discretionary LLP reporting in the year prior to the implementation of IFRS 9. The table repeats the analysis in Table 5, Panel C replacing *Treated* with *Pre_Treated*, an indicator variable which equals one if a bank adopts ECL in the *following* fiscal year. The dependent variable, *Discretionary_LLP*, is computed as in Table 5, namely as the residual from the regressions in Table 5, Panel A. *Earnings_BTP* is net income before taxes and discretionary LLP provisions (measured using the model in Panel A). *Capital_Total* is the total capital adequacy ratio. *Capital_Tier1* is the capital adequacy Tier 1 ratio. *Treated* equals one if *LLP* is reported under IFRS 9, and zero otherwise. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is defined as the fractional change in the spread of the five-year sovereign CDS of the country). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable: *Discretionary_LLP*			
	Y=Capital_Total		*Y=Capital_Tier1*	
	Lower	*Higher*	*Lower*	*Higher*
Independent Variables:	(1)	(2)	(3)	(4)
*Y(t-1)*Pre_Treated*	−0.34	1.33	−0.15	−0.43
	(−1.04)	(1.59)	(−0.23)	(−0.36)
Y(t-1)	−0.91	1.55	−0.86	1.17
	(−1.46)	(1.61)	(−1.32)	(1.14)
*Earnings_BTP*Pre_Treated*	0.00	−0.07*	−0.01	−0.05
	(0.14)	(−1.77)	(−0.29)	(−1.23)
Earnings_BTP	0.49***	0.48***	0.50***	0.47***
	(10.58)	(11.53)	(8.80)	(11.47)
Treated	0.07	−0.27	0.06	0.05
	(1.11)	(−1.61)	(0.70)	(0.15)
Controls	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
R^2	0.970	0.938	0.972	0.939
N	394	409	345	409

Table OF3. Predictive ability of LLP prior to the adoption of ECL

This table presents an analysis of the ability of loan loss provisions to predict bank risk in the year prior to the implementation of IFRS 9. The table repeats the analysis in Table 2 replacing *Treated,* with *Pre_Treated* as an indicator variable which equals one if a bank adopts ECL in the *following* fiscal year. The dependent variables *Future_Volatility, Future_Avg(|Ret|)* and *Future_Tail_Risk* are measures of future risk over year t+1 (see Appendix A for detailed variable definitions). *LLP* is loan loss provisions in year t divided by total assets. *Lower* (*Higher)* indicates below (above) median values of *Δ_Credit_Risk* for year 2018 (*Δ_Credit_Risk* is the fractional change in the spread of the five-year sovereign CDS of the country). The sample includes a panel of firm-year observations from 2014 to 2018 corresponding to our sample of systemically important banks. See Appendix A for other variable definitions. Standard errors are clustered by firm. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

	Dependent variable:					
	Future_Volatility		*Future_Avg(|Ret|)*		*Tail Risk*	
	Lower	*Higher*	*Lower*	*Higher*	*Lower*	*Higher*
	(1)	(2)	(3)	(4)	(5)	(6)
*LLP*Pre_Treated*	0.04	−0.11	0.04	−0.10	0.13	−0.30
	(0.49)	(−0.38)	(0.75)	(−0.52)	(0.67)	(−0.59)
LLP	0.07	−0.19	0.09	−0.14	−0.11	−1.19*
	(0.68)	(−1.28)	(0.81)	(−1.44)	(−0.36)	(−1.92)
Pre_Treated	0.61***	1.36***	0.48***	0.43	0.92**	2.45*
	(4.18)	(3.27)	(3.94)	(0.64)	(2.21)	(1.85)
Controls:	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.911	0.954	0.922	0.920	0.814	0.821
N	417	488	417	484	413	490