Market reaction to the expected loss model in banks

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Abstract

We investigate how investors perceive the adoption of the expected-loss model (ELM) for impairment incorporated in IFRS 9. Using a sample of European listed banks covering the period of the standard-setting process of IFRS 9, we examine whether the market perceives the new regulation to increase shareholder wealth. First, we document a positive market reaction to the ELM adoption events. Second, we find that investors perceive that the potential benefits of ELM are more pronounced for larger banks, banks with lower profitability and higher systemic risk, and for those that received a public bailout and with more positively skewed returns. Overall, these results support a "monitoring" channel suggesting that ELM may lead to greater bank transparency and more effective market discipline, fundamental for improving financial stability.

Keywords: *Expected loss model; impairment; IFRS 9; loan loss provisions; stock market reaction.*

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"The shift from an incurred loss approach to an ECL approach for measuring impairment allowances is the most important change introduced by IFRS 9."

European Systemic Risk Board (ESRB), July 17, 2017

1. Introduction

Accounting for loan loss provisioning is a critical issue for banks because of its implications for financial reporting transparency, regulatory capital, and financial stability (Bushman and Williams 2012; Bushman, 2016). They can impinge on bank loan prices, and there is evidence that they may also affect the macro-economy and bank risk-taking (Laeven and Majnoni, 2003; Bouvatier and Lepetit, 2008; Beatty and Liao, 2011; Bushman and Williams, 2012 and 2015; Cohen et al., 2014; Agénor and Zilberman, 2015; Krüger et al., 2018). For example, Lim et al. (2014) provide evidence that delayed loss recognition can affect bank loan pricing during the crisis.

In this paper, we zoom in on the loan loss provisioning rules incorporated in International Financial Reporting Standard (IFRS) 9, which replaces the International Accounting Standard (IAS) 39 and is effective for fiscal years beginning on January 1, 2018. The IFRS 9 replaces the Incurred Loss Model (ILM) for impairment of loans and other financial assets, as defined by IAS 39, with an Expected Loss Model (ELM). In particular, we aim to answer the following research questions: Do investors perceive the switch from an Incurred Loss Model (ILM) to an Expected Loss Model (ELM) to enhance shareholder value? Which banks benefit the most from the new rules?

We offer an empirical investigation of how stock markets respond to the new rules using an event study approach. There are two main reasons why using an event study approach in our setting is beneficial to address our research questions. First, because of the recent implementation date, examining the long-term impact of the new rules is not yet possible. An event study approach allows us to estimate the shareholder-value implications of the new regulation, according to the investors' perceptions when the standard-setting process of IFRS 9 was under development. In this respect, our study is similar to others examining the impact of the announcements related to new banking

regulations on bank stock prices (for example, Bruno et al., 2018). Second, investigating the market reaction to individual announcements enables us to test whether the expectations of the standard setters regarding the potential benefits and costs of the new rules differ from those of the market. In particular, the market might be more sensitive than the standard setters to increases in compliance costs. In fact, during the standard-setting process, there were vocal concerns about the compliance costs related to new requirements of IFRS 9 impairment rules for the banking industry.[1]

The increase in compliance costs is one of the channels through which ELM announcements might have affected shareholder value in European banks. A second channel is the "monitoring" channel, which is related to the higher degree of information transparency that ELM should (allegedly) provide to investors. Such channels are *not* mutually exclusive and can operate simultaneously. The "compliance cost" channel is based on the fact that banks for which complying with IFRS 9 might result in substantial operational costs might experience a negative (or less positive) stock price reaction to ELM announcement events. This channel is of fundamental importance because, as reported in Deloitte's sixth Global IFRS Banking Survey in May 2016, most global banks and financial institutions estimate that these new rules will substantially impact compliance costs.[2] The "monitoring" channel predicts that shareholders of riskier banks benefit from the ELM because it enhances market discipline. A higher degree of transparency improves investors' ability to obtain information about banks' safety and soundness (Acharya and Ryan 2016), meaning that the switch to ELM may lead to a reduction in monitoring costs.

A third channel might also exist. Since the higher degree of discretion granted by the new regulation might lead to an opportunistic delay of loss impairment recognition (Bushman and

[1] *"[…] from the outreach activities performed, the EBA understands that the main impact of IFRS 9 for banks will most likely be due to the new impairment requirements rather than the requirements on classification and measurement or general hedging. As mentioned above, we understand that the new impairment model should lead to an earlier recognition of credit losses, affecting more financial assets and at a higher amount than the current IAS 39*."Andrea Enria, Chairman of European Banking Authority, June 26, 2015.

[2] For example, 39% of the respondents with more than €100 million in the gross lending report that to change to a fully-compliant IFRS 9 program, they would need a budget between €25 million and €100 million, and 4% of the respondents declared that they would require a budget over €100 million (Deloitte, 2016a).

Landsman, 2010; Ahmed et al., 2013). This "opportunistic behavior" channel (Christie and Zimmerman, 1994) should lead to a negative reaction from the market. The "monitoring" and the "opportunistic behavior" channels are mutually exclusive. However, the "compliance cost" may reinforce either the other two channels, as we explain in the hypotheses section below.

From a theoretical perspective, it is hard to determine which channel should be more important. Provided that the new regulation improved market discipline ("monitoring" channel is true), and compliance costs do not outweigh such benefits, we should expect an overall positive price reaction. However, if the compliance costs outweigh these benefits, or if the "opportunistic behavior" channel is true, a negative price reaction is possible. Thus, it is necessary to explore this research question from an empirical perspective.

Our paper is not the first one to investigate the impact of different types of loan impairment rules. However, most of the existing literature has focused on the ILM under IAS 39 (among others, Gebhardt and Novotny-Farkas, 2011; O'Hanlon, 2013), and only Armstrong et al. (2010) investigate IAS 39 from a "capital markets" perspective, considering announcements concerning the adoption of IAS 39 and IAS 32. Moreover, recent research has failed to establish whether the ELM had a significant impact on bank shareholders' wealth (Onali and Ginesti, 2015), and changes in financial reporting rules may have only second-order effects on firm value (Zimmerman, 2013). Thus, it is important to understand the mechanism through which the ELM rules impact the price of bank stocks. We fill this gap in the literature.

Our main findings are as follows. First, we provide evidence of a positive reaction to ELM announcements. For the 13 announcements related to ELM, the average 5-day Cumulative Abnormal Return (CAR) ranges between 1.8% and 2.5%, depending on the specification used. This finding is consistent with the "monitoring" channel: investors perceive the new regulation to be value-enhancing because it improves market discipline, and these benefits outweigh its compliance costs.

Second, we find that the price reaction is stronger for banks with lower profitability and banks with higher levels of systemic risk (proxied by either bank size or Marginal Expected Shortfall) or banks that received a bailout. These results are also consistent with the "monitoring" channel. However, the results for systemic risk are also consistent with the "compliance cost" channel since larger banks are more likely to withstand additional compliance costs.

Third, we provide some evidence (although not very robust) that banks located in countries with higher sovereign debt risk react more positively to ELM announcements. This latter finding suggests that IFRS 9 may benefit banks in countries where there is a feedback effect between sovereign debt risk and the risk of the domestic financial sector (Acharya et al., 2014).

Finally, we provide evidence that banks whose stock returns are more positively skewed experience a stronger positive price reaction. Since positive skewness in stock returns can proxy for the tendency to delay bad news, this result is consistent with the view that shareholders of banks that are more likely to delay loss recognition react more positively to ELM announcements, consistent with the "monitoring" channel. Our results are robust to the inclusion of country-level and bank-specific control variables that allow for the macroeconomic and institutional environment (GDP growth, inflation, the degree of investor protection and competition), corporate governance characteristics, and bank transparency.

The rest of the paper is structured as follows. Section 2 reports the institutional background and develops the hypotheses. Section 3 describes the sample and reports the events under examination. Section 4 describes the methodology. Section 5 discusses the results. Section 6 concludes the paper.

2. Institutional background and hypotheses development

2.1 IFRS and the capital markets

The debate about the potential implications of IFRS adoption for capital markets has mainly focused on nonfinancial companies (Daske et al., 2008 and 2013; Ahmed et al., 2013; Brüggemann

et al., 2013; Ramanna and Sletten, 2014; Christensen et al., 2015; Ball et al., 2015). Although a vast literature suggests that IFRS are a source of benefits for capital markets, there are also scholars that question the interpretation of these findings (De George et al., 2016); moreover, some literature argues that the impact of IFRS adoption on capital markets may not be as significant as previously thought (Christensen, 2012; Christensen et al., 2013; Daske et al., 2013).

Recent empirical studies have found evidence of positive capital markets effects resulting from the implementation of IFRS (Daske et al., 2013; Horton et al., 2013) and during the events leading up to IFRS adoption (Armstrong et al., 2010; Leung and Joss 2013; Prather-Kinsey and Tanyi, 2014; Onali and Ginesti, 2014; Onali et al., 2017; Chen et al., 2019). The main channel through which IFRS should bring about benefits to international investors is the level of information quality of financial statements (Ball, 2006): IFRS should decrease asymmetric information and improve information quality. Such a reduction in asymmetric information should, in turn, improve market efficiency (Daske et al., 2008), analyst predictions (Byard et al., 2011), and cross-border investment (Gordon et al., 2012). Because asymmetric information also leads to higher monitoring costs (Acharya and Ryan, 2016), IFRS is also likely to reduce the cost of capital. Consistent with this hypothesis, Li (2010) provides evidence that the mandatory adoption of IFRS in the EU reduced firms' cost of capital, but only for countries with strong legal enforcement.

2.2 A comparison between IAS 39 and IFRS 9

The recognition of expected losses under IFRS 9 is substantially different from the IAS 39 provisioning rules. Particularly, the impairment model is based on the recognition of expected and incurred losses. Table 1 reports the main differences in the impairment models according to IFRS 9 and IAS 39.

[Insert Table 1 here]

The main innovation of IFRS 9 is the 'three-stage' ELM model based on the deterioration in the credit quality of financial assets since initial recognition (Novotny-Farkas, 2016). Banks are required

to estimate periodically expected credit losses and adjust loan loss provisions accordingly. Such innovation was necessary because, as emphasized by IASB (2014a) in a press release (July 24, 2014):

"During the financial crisis, the delayed recognition of credit losses on loans (and other financial instruments) was identified as a weakness in existing accounting standards".

Financial instruments are classified into three categories. Financial instruments that have not suffered from a significant deterioration (*performing financial instrument*) in credit risk since initial recognition or that have low credit risk[3] are classified as "*Stage 1*" instruments. For *Stage 1* assets, banks need to recognize the 12-month expected credit loss and the interest revenue on these assets (estimated using the effective interest rate method) is based on their gross carrying amount. *Stage 2* includes financial assets that have had a significant deterioration in credit risk (*deteriorated financial instrument*) since initial recognition, even in the absence of objective evidence of impairment. For this category, the lifetime expected credit losses should be recognized, and the effective interest rate method should be applied to the gross carrying amount, similar to *Stage 1* assets. Finally, assets classified under the *Stage 3* category are those for which there is objective evidence of impairment at the reporting date (*non-performing financial instrument*). For these assets, lifetime expected credit losses should be recognized, and the effective interest rate method should be applied to the net carrying amount (PwC, 2014; Deloitte, 2016b).

The changes described above affect the ability of managers to use discretion when deciding the timing of impairment recognition. Gebhardt and Novotny-Farkas (2011) argue that the ILM under the IAS 39 restricts earnings smoothing because of the need for objective evidence of impairment. On the other hand, IFRS 9 requires managers to use greater discretion in estimating the effects of changes in credit risks based on both backward-looking and forward-looking information. Indeed, IFRS 9 also allows banks to use qualitative and macroeconomic information to supplement the measurement of default risk. The inclusion of qualitative information represents another relevant

[3] An 'investment grade' rating may be considered a justification for a "low credit risk" judgement (Deloitte, 2016b).

novelty from IAS 39. Although this gives bank managers margins of appreciation, this discretion is deemed necessary to ensure that banks accumulate enough reserves during periods of growth to absorb losses in periods where more credit losses are anticipated (Gomaa et al., 2019). The use of forward-looking information is crucial because the backward-looking nature of the ILM has been an important factor contributing to the deterioration of transparency of banks' financial statements in the run-up and during the financial crisis (Laux and Leuz, 2010; Beatty and Liao, 2011; Laux, 2012).

2.3 Aggregate market reaction to ELM announcements

The IASB and international policymakers have emphasized the key role of ELM in improving investor confidence in banks' balance sheets (IASB, 2014b) and expect the ELM to have a major impact on the European banking system. Because of the potential negative externalities of financial instability, the ELM application is likely to affect the European economy as a whole (European Securities and Markets Authority, 2015).

The introduction of the ELM approach aims to ensure that the reported expected loan losses reflect the economic value of the financial instruments held by a bank (Krüger et al., 2018). As reported in Table 1, the ELM is based on a three-stage approach that influences banks' timing choices to recognize impairments. Financial instruments can be classified at *Stage 1* if there are expected loan losses which may occur in a 12-month window after the reporting date, even in the absence of objective evidence of impairment (the triggering event for IAS 39). Thus, recognition of expected losses should happen earlier than when using IAS 39. The consideration of forward-looking information for estimating of the Probability of Default (PD) and other important parameters is essential under IFRS 9 and Basel III rules.

The ELM imposes that banks recognize not only credit losses occurred but also the future expected losses. In doing so, the ELM should improve the understanding of banks' loss-absorbing capacity and allows investors to assess their risk-taking profile (Bushman and Williams, 2012 and 2015). Timely recognition of forthcoming losses is supposed to enhance information transparency, leading to more

effective market discipline (Bushman and Williams, 2015; Novotny-Farkas, 2016; European Systemic Risk Board, 2017). Thus, to the extent that the timely recognition of impairment losses into financial statements improves investors' ability to evaluate better bank fundamentals (facilitating market discipline), share prices may respond positively to this new regulation (Bushman and Williams, 2015).

Given these arguments, we predict an overall positive market reaction to the new ELM promoted by the adoption of IFRS 9 and hypothesize the following:

> ***H1a ("monitoring" channel)***: *ELM announcements lead to a positive price reaction for European bank stocks.*

This hypothesis is consistent with the "monitoring" channel described above.

However, such discretion might be a double-edged sword (Bushman and Landsman, 2010) because it might have negative consequences for shareholder value for two reasons. First, a higher degree of managerial discretion may enable banks to inflate the level of earnings and regulatory capital (Bushman and Landsman, 2010). In particular, the accounting literature suggests market pressures may encourage opportunistic accounting choices (Cohen and Zarowin, 2010). Second, discretionary loan loss provisions may impair transparency and hinder market discipline on riskier banks. For instance, a higher managerial discretion might allow an opportunistic delay of loss impairment recognition to smooth income and build up reserves (Bushman and Landsman, 2010; Ahmed et al., 2013), consistent with the "opportunistic behavior" channel. Moreover, compliance costs might offset the benefits of the potential improvement in market discipline ("compliance cost" channel). For this reason, the impact of ELM announcements could also be negative, leading to the following hypotheses:

> ***H1b ("compliance cost" channel)***: *ELM announcements lead to a negative price reaction for European bank stocks.*

H1c ("opportunistic behavior" channel): *ELM announcements lead to a negative price reaction for European bank stocks.*

We test for the validity of ***H1a***, ***H1b***, and ***H1c*** by estimating the reaction of a portfolio (both market-weighted and equal-weighted) of banks in 15 Western European countries, using as a benchmark the DJ STOXX Global 1800 Index Ex Europe. The constituents of this index are the 1,800 world's largest international firms, excluding the European firms in the index. Using this index allows us to avoid including large European banks in our benchmark.

Importantly, in equilibrium, the effect of the ELM adoption on managers' ability to use discretion might be insignificant because the benefits of a higher degree of discretion (a more timely recognition of loan losses) might be offset by the costs of opportunistic delayed recognition and compliance with the new regulation.

2.4 ELM announcements and bank profitability

The price reaction to ELM announcements may depend on bank profitability. In particular, market participants perceive the benefits of IFRS 9 as more pronounced for banks with worse performance because they may be more likely to engage in risk-shifting activities in the absence of market discipline (Bushman and Williams, 2012). Since the shift from the ILM to the ELM should improve market discipline ("monitoring channel") and reduce risk-shifting, banks with poor profitability should react better than banks with better profitability to ELM announcements:

H2a ("monitoring" channel): *There is a negative correlation between bank profitability and the price reaction to ELM.*

However, in addition to market discipline ("monitoring" channel), another potential factor affecting the price reaction of bank stocks to the ELM is the compliance costs. Such costs are likely to be particularly burdensome for unprofitable banks. For this reason, we also set forth an alternative hypothesis:

H2b ("compliance cost" channel): *There is a positive correlation between bank profitability and the price reaction to ELM.*

As before, we also consider the opportunistic behavior channel, which in this case also lead to a positive correlation between bank profitability and the price reaction to ELM.

H2c ("opportunistic behavior" channel): *There is a positive correlation between bank profitability and the price reaction to ELM.*

We test these alternative hypotheses using ROA (returns on total assets) as a proxy for bank profitability.

2.5 ELM announcements and bank systemic risk

We expect that the net benefits of IFRS 9 would be more pronounced for banks with a higher degree of systemic risk (Bushman and Williams, 2015). There is some evidence that a higher level of bank riskiness might create incentives for managers to engage in income-decreasing accounting choices (Doyle et al., 2007; Leventis et al., 2011). Since ELM should improve market discipline, the price reaction for banks with a higher level of systemic risk should be better than for banks with a lower level of systemic risk. Moreover, systemically riskier banks are also likely to be larger, and thus they should be able to withstand the compliance costs of IFRS 9 better than smaller banks. Thus, both the "monitoring" and the "compliance costs" channel should lead to a positive relationship between systemic risk and the price reaction. Therefore, our hypotheses are as follows:

H3a ("monitoring" channel): *There is a positive correlation between bank systemic risk and the price reaction to ELM.*

H3b ("compliance cost" channel): *There is a positive correlation between bank systemic risk and the price reaction to ELM.*

However, since the higher degree of discretion deriving from the new regulation might lead to an opportunistic delay of loss impairment recognition (Bushman and Landsman, 2010; Ahmed et al.

2013), investors of larger and systemically-riskier banks could react negatively to the new accounting standards' announcements. Based on these arguments, we also formulate the following alternative hypothesis:

> ***H3c ("opportunistic behavior" channel)***: *There is a negative correlation between bank systemic risk and the price reaction to ELM.*

We proxy for systemic risk using several variables. First, we use *Size*, defined as the log of total assets (Bayazitova and Shivdasani, 2012) because larger banks are more exposed to political and regulatory scrutiny, and thus they are more likely to engage in earnings management activities (Watts and Zimmerman, 1990; Duru et al., 2018). Second, we use the Marginal Expected Shortfall (hereafter, *MES*), which is defined as the one-day loss of equity for a bank when the market return is below –2 percent (Acharya et al., 2012; Vallascas et al., 2017). Unlike *Size*, this variable has the advantage of helping regulators to estimate the distress costs related to a potential default in case of market turbulence (Acharya et al., 2012). Moreover, we also consider a dummy variable equal to one if the bank receives a public bailout and zero otherwise (*Public Bailout*). According to Bayazitova and Shivdasani (2012), banks with a higher systemic risk are more likely to receive a public bailout amid the TARP program in the US.

2.6 ELM announcements and sovereign debt risk

The risk of the financial sector can also be related to sovereign debt risk, and there could be a feedback effect between the sovereign debt risk and the risk of the financial sector in a country (Acharya et al., 2014). In line with ***H3a***, we argue that there should be a positive relationship between sovereign debt risk and the price reaction of banks in a specific country:

> ***H4a ("monitoring" channel)***: *Sovereign debt risk has a positive correlation with the price reaction to ELM.*

H4b ("compliance cost" channel): *Sovereign debt risk has a positive correlation with the price reaction to ELM.*

Notably, ***H4a*** and ***H4b*** are related to the "monitoring" and the "compliance cost" channels indirectly because of the impact of sovereign debt risk on the risk of the banking sector.

Along the same line of the previous arguments related to the systemic risk, if our estimates confirm the "opportunistic behavior" channel behind ***H3c***, we also speculatively postulate the following alternative hypothesis:

H4c ("opportunistic behavior" channel): *Sovereign debt risk has a negative correlation with the price reaction to ELM.*

To capture the effect of sovereign debt risk for Eurozone countries, we add a dummy variable (*GIIPS*) identifying countries with particularly unstable banking systems during the Eurozone crisis (which lasted throughout our sample period), such as Greece, Ireland, Italy, Portugal, and Spain (Bruno et al. 2018).

2.7 ELM announcements, credit risk and delayed loss recognition

Regulators argue that ILM of IAS 39 contributes to pro-cyclicality by increasing the tendency of banks to increase (decrease) LLP during recessionary (expansionary) periods (Financial Stability Forum, 2009; Financial Crisis Advisory Group, 2009). Recognition of loan losses under the ILM is postponed until borrowers' default, and therefore the ILM may amplify the impact of negative shocks and exacerbate the pro-cyclicality effect during recent financial turmoil (Beatty and Liao, 2011 and 2014; Laux, 2012; Agénor and Zilberman, 2015; Financial Stability Forum, 2009; Basel Committee on Banking Supervision, 2009). In particular, Bushman and Williams (2015) highlight that delayed recognition of loan losses may conceal a bank's portfolio risk attributes, hindering identification of the actual amount of capital available to buffer unexpected losses. Thus, it may create expected loss overhangs, leading to lower future bank profitability and capital ratios.

To solve these problems, a forward-looking approach for loss recognition may be preferable because it would encourage banks to capture future deteriorations in bank loan portfolios. This type of approach should decrease bank opacity and enhance the ability of investors to assess a bank risk, leading to stronger market discipline (Bushman and Williams, 2012 and 2015; Duru et al., 2018). These arguments suggest that the ELM may reduce the likelihood of opportunistic build-ups of loss overhangs and the overstatement of regulatory capital, enhancing transparency and supporting more active external monitoring on the bank managers' lending strategies (Vyas, 2011; European Banking Authority, 2015; Novotny-Farkas, 2016). Since the new ELM is likely to reduce the probability that banks delay the recognition of credit losses because of improved market discipline ("monitoring" channel), banks with a higher probability of delayed loss recognition should benefit to a greater extent from the switch to ELM. For these reasons, our next hypothesis is as follows:

> ***H5 ("monitoring" channel)***: *There is a positive correlation between proxies for delayed loss recognition and the price reaction to ELM.*

For this hypothesis, the other channels are unlikely to play a role because the skewness of the returns are not affected by the compliance costs and are unlikely that losses will be recognized later under the ELM.

We use as a proxy the monthly skewness of daily stock returns (*Skewness*). *Skewness* tends to be positive for firms that delay the release of bad news (Bae et al., 2006). The release of bad news is likely to be positively associated with delayed releases of loan losses. Thus, a larger positive *Skewness* may indicate a less timely recognition of loan losses.

2.8 ELM announcements and credit risk models

Basel III rules require banks to measure credit risk to calculate regulatory capital. Banks that adopt the standardized approach are likely to lack the data to fulfil the IFRS 9 requirements because they rely on external credit assessments to measure credit risk. On the other hand, banks that use advanced Internal Rating Based (IRB) approaches are likely to be able to leverage the data used for Basel III

compliance to meet IFRS 9 requirements (Temim, 2016). However, such models need to be adjusted (Miu and Ozdemir, 2016). Banks that employ advanced IRB models should, therefore, be subject to lower compliance costs ("compliance cost" channel) relative to banks that employ the standardized approach, leading to a better price reaction to ELM announcements.

> ***H6***: *The use of advanced IRB approaches is positively correlated with the price reaction to ELM.*

To test this hypothesis, we construct two dummy variables: *F-IRB*, which is equal to one if foundation models are used, and zero otherwise; and *A-IRB*, which is equal to one if advanced IRB models are used, and zero otherwise.

[Insert Table 2 here]

3 Data and event dates

3.1 Sample

We merge and collect information from different data sources. We collect information on bank-specific variables (financial statements data and ownership structure data) from Bankscope, apart from *MES*, for which we collect from V-Stern Lab's website.[4] Second, we collect information on public bailouts on European banks from Mediobanca.[5] Finally, we collect information on corporate governance characteristics and the use of foundation and advanced IRB from annual bank reports.

We start our sample selection by choosing from Bankscope all listed banks from 15 European countries (Chen et al., 2013).[6] This selection criterion leads to 353 banks, but for 19 of these banks, even basic financial data, such as total assets and net income, are missing. For the remaining 334 banks, we collect closing daily stock prices from Datastream for the period 2009-2014. Next, we exclude banks for which data on regulatory capital ratios are not available (resulting in 201 banks).

[4] https://vlab.stern.nyu.edu/analysis/RISK.WORLDFIN-MR.GMES?selectedDate=2018-03-02.
[5] https://www.mbres.it/sites/default/files/resources/download_it/rs_Piani%20di%20stabilizzazione%20finanziaria.pdf.
[6] To avoid sample selection bias due to attrition, we include banks that were delisted over the sample period.

In line with Onali et al. (2016), we assume the presence of at least one annual report available from the banks' institutional websites for the period 2009-2014 (this step is necessary to collect data on corporate governance variables). These criteria result in a final sample of 115 banks. However, in the regressions to examine the determinants of the CARs the sample is further reduced, in some specifications, due to data availability.

To prevent that the Subprime Mortgage Crisis (which ended in June 2009) may affect the estimation of the price reactions, our sample period goes from July 3, 2009, to December 31, 2014.[7,8]

[Insert Table 3 here]

Table 4 reports descriptive statistics (mean, median, standard deviation, minimum, and maximum) of the variables we use in our tests.

[Insert Table 4 here]

3.2 Event dates

We identify 13 events over the period 2009-2014 that relate to the standard-setting process for the ELM introduced by IFRS 9. We consider public announcements related to news and press releases from the IASB and European Financial Reporting Advisory Group (EFRAG). These announcements are strictly related to the standard-setting process of IFRS 9 for Europe. Under EU accounting regulation, each IFRS has to be approved through a specific procedure called "endorsement mechanism", which requires that EFRAG provide recommendations to the European Commission for the endorsement of IFRS in Europe.

In Table 5, we report the events associated with IFRS 9 that refer to the adoption of new impairment accounting rules.

[7] Duca, John V. (Federal Reserve Bank of Dallas) (2014). "Subprime Mortgage Crisis". Federal Reserve History. https://www.federalreservehistory.org/essays/subprime_mortgage_crisis.
[8] https://www.nber.org/cycles/.

[Insert Table 5 here]

To understand whether the events were of interest to the investors, we examine the extent to which the Google Search Volume Index (SVI) for the keyword "IFRS 9" is higher in the weeks corresponding to the 13 events reported in Table 4. The literature has employed Google SVI as a proxy for investor attention (Da et al., 2011; Drake et al., 2012). We run a two-sample t-test for the period from May 3, 2009, to September 6, 2014, as well as a Wilcoxon rank-sum test. Consistent with expectations, the SVI is significantly larger in weeks around IFRS 9 adoption events, with an average SVI equal to 55.30 for the events-weeks and 44.83 for the non-events weeks (p-values are: 0.0115 for the t-test and 0.0479 for the Wilcoxon rank-sum test). These results confirm that the events we have considered attracted investor attention, supporting the view that any significant price reaction around those dates is related to IFRS 9 announcements.

4. Methodology

This section describes the methodology used to run the even study (Section 4.1) and for the subsequent analysis of the cross-sectional determinants of Cumulative Abnormal Returns (CARs) (Section 4.2).

4.1 Event study

The empirical literature on stock price reactions to announcements on IFRS adoption is quickly growing, and it covers both IFRS as a whole and specific accounting standard (Armstrong et al., 2010; Leung and Joss 2013; Prather-Kinsey and Tanyi, 2014; Onali and Ginesti, 2014). Recent contributions in the banking literature have employed event study methodology in the areas of banking regulation (Bruno et al., 2018) and monetary policy (Aït-Sahalia et al., 2012).

Despite a large amount of literature using event studies, there is no consensus on choosing the method for estimating stock price reactions (Bruno et al., 2018). An important issue is, for example, the length of the event window. Although Aït-Sahalia et al. (2012) stress that limiting the event

window reduces the influence of confounding events, Brown and Warner (1980) highlight that short event windows do not necessarily lead to better estimates of abnormal returns. Similarly, there is no consensus in the literature regarding the length of the estimation window. For this reason, we provide a series of robustness tests for both the event window and the estimation window, and we also explore the possibility that confounding events might affect the results.

To ensure that our results are robust to the length of the event window, for each of the 13 events, we estimate the abnormal returns (ARs) for a five-day (-2,2) and a three-day (-1,1) event window (for robustness and consistency with Bruno et al., 2018). Our main tests assume both an estimation window of 120 trading days and 90 trading days to allow for potential parameter instability during the sample period. We decide to use shorter estimation windows than in other recent papers (for example, Bruno et al., 2018) to mitigate the impact of the 2007-2009 crisis on our analysis.

We compute the ARs using the market model based on daily log-returns of each bank, including day-of-the-week dummy variables (Kaplanski and Levy, 2010):

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t} + \sum_{d=2}^{5} \lambda_d D_d) \quad (1)$$

where D_d=1 if d=2 for Tuesdays, d=3 for Wednesdays, d=4 for Thursdays, d=5 for Fridays and D_d=0 otherwise.

Then, we estimate the corresponding CARs for the four-event windows:[9]

$$CAR_{i,t} = \sum_{t=t1}^{t2} AR_{i,t} \quad (2)$$

We employ the DJ STOXX Global 1800 Index Ex as a proxy for the market portfolio. This proxy captures global macroeconomic events, which are likely to have affected large European listed banks.

[9] Because we run our tests using four different event windows for our regressions, t_1 and t_2 can take different values. For instance, when we rely on a 3-day estimation window (-1,1), t_1 indicates the trading day before the event, while t_2 is the trading day after the event.

To test the hypothesis that market reactions to the announcements about the IFRS 9 are significantly different from zero, we use equal-weighted and market-weighted portfolios for the bank stocks in our sample. Specifically, we calculate the aggregate effect of the announcements referring to IFRS 9 by considering the sample-average CARs over all 13 events.

Importantly, we multiply by minus one the CAR for events with a negative effect on the likelihood of IFRS 9 adoption and implementation as proposed originally by IASB (Armstrong et al., 2010; Onali and Ginesti, 2014; Bruno et al., 2018). These events occur respectively on April 8, 2011 (event #5), and August 4, 2011 (event #6).

For event #5, EFRAG issued a comment letter[10] that expressed concerns regarding the proposal to set a "floor" for credit losses expected to occur within the foreseeable future. EFRAG also stated that "if the IASB were to retain a floor in the model, EFRAG suggests that it would not be based on the notion of some indeterminate 'foreseeable future'" (EFRAG, p. 3). Moreover, EFRAG pointed out that "the IASB will need to consider the entire repackage of proposals before finalizing the resulting standard" (EFRAG, p. 5).

Event #6 refers to an exposure draft issued by IASB (ED/2011/3 Amendments to IFRS 9 (2009) and IFRS 9 (2010): Mandatory Effective Date), which proposes to postpone the mandatory effective date from January 1, 2013, to January 1, 2015.

After multiplying the CARs for event #5 and event #6 by minus one, we sum the CARs for all events to measure the market-wide reaction to ELM announcements. Because the assumption of normally distributed CARs might be invalid,[11] we employ bootstrap simulations to evaluate the cumulative impact of all thirteen events (Armstrong et al., 2010; Bruno et al., 2018).

In our analysis of the aggregate reaction to ELM announcements, we present the results for the total and average CAR after excluding event #12. This event is related to a statement by Mario Draghi

[10] The document title is: "EFRAG's position on the IASB Supplementary Document Financial Instruments: Impairment".
[11] The violation of the Normality assumption may lead to unreliable t-statistics.

(the previous president of the European Central Bank), which prompts the EU to progress with the introduction of IFRS 9 swiftly. This statement can be interpreted as a sign that the IFRS 9 will be introduced soon. However, it could also suggest uncertainty about the overall progress of the IFRS 9 standard-setting process (which may have prompted Mario Draghi to make the announcement). Additionally, this announcement occurred during a period of uncertainty about the convergence between IASB and FASB approaches, as suggested by a sentence in the same press release, "Efforts between the global standard-setter the IASB, and US counterpart FASB, to create a converged financial instruments standard ended earlier".[12]

We implement a two-step procedure to perform the bootstrap simulations. First, we exclude days that fall in our event windows for the thirteen events to consider only non-event trading days. Second, we randomly identify thirteen non-overlapping placebo events for the period of analysis. This step is repeated 1,000 times. Third, we compute the sum of the CARs for the thirteen events for each of the 1,000 samples of placebo tests (Bruno et al., 2018).

Finally, we compute the p-values by considering the number of cases for which a particular CAR is larger than the estimated value based on two tail-tests.

4.2 Cross-sectional determinants of CARs

In the second stage of our analysis, we investigate the cross-sectional determinants of CARs. The baseline specifications are based on the following model:

$$CAR_{i,t} = \alpha + \beta X_{i,t} + \beta Controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where *X* is our set of variables to test our hypotheses (*ROA*,[13] *Size*, *MES*, *Bailout*, *GIIPS*, *Skewness*, *F-IRB*, and *A-IRB*). Furthermore, we use a set of bank-specific, market structure, and macroeconomic controls.

[12] https://www.accountancyage.com/aa/news/2354602/draghi-tells-eu-to-progress-swiftly-in-adopting-ifrs-9
[13] When we use net income to equity (ROE) instead of ROA, the results remain unaltered.

First, we control for bank transparency (Nichols et al., 2009; Jiang et al., 2016; Manganaris et al., 2017; Danisewicz et al., 2020) with a proxy for *Discretionary LLP*, which is related to the timeliness of loan loss provision. *Discretionary LLP* is calculated as the residual component ($\boldsymbol{\varepsilon_{i,t}}$) of the following regression:

$$\boldsymbol{LLP_{i,t} = \alpha_0 + \alpha_1 \Delta NPL_{i,t-1} + \alpha_2 \Delta NPL_{i,t} + \alpha_3 \Delta NPL_{i,t+1} + \alpha_4 NCO_{i,t} + \alpha_5 NCO_{i,t+1} + \alpha_6 LLR_{i,t-1} + \alpha_7 Loan\ Growth_{i,t-1} + \alpha_8 Risk_{i,t-1} + \alpha_9 Size_{i,t+1} + \alpha_{10} LTA_{i,t+1} + Bank\ fixed\ effects + Year\ Fixed\ Effects + \varepsilon_{i,t}} \quad (4)$$

where $LLP_{i,t}$ stands for the current level of loan loss provision divided by lagged values of total loans; $\Delta NPL_{i,t}$, $\Delta NPL_{i,t-1}$, $\Delta NPL_{i,t+1}$ are the current, lagged and future changes in non-performing loans scaled by total loans; $NCO_{i,t}$ and $NCO_{i,t+1}$ are the current and future level of net loan charge-offs (again scaled by total loans); $LLR_{i,t-1}$ is the lagged ratio of loan loss reserves to total loans; *Loan Growth*$_{i,t-1}$ is the ratio of current loans to lagged loans; *Risk*$_{i,t-1}$ is the Tier 1 risk-based capital ratio; *Size*$_{i,t-1}$ is the natural log of total assets (lagged); and $LTA_{i,t-1}$ is the lagged value of total loans to total assets. We also include bank fixed effects and year fixed effects.

Second, we control for a set of country-level variables to allow for heterogeneity in the institutional and macroeconomic conditions across the 15 countries of our sample, following previous literature (Demirgüç-Kunt and Huizinga, 2004; Cubillas et al., 2012; La Porta et al., 1997, 1998; Beck et al., 2006; Djankov et al., 2008; Anginer et al., 2014). In particular, we control for market concentration because a more concentrated banking market might be more likely to suffer. We employ as a proxy for concentration the share of total commercial banking assets belonging to the top five banks in that country (*CR5*). Then, we include *GDP Growth* and *Inflation* to allow for potential business cycle effects (Anginer et al., 2014). *GDP Growth* is measured as the growth rate of the real GDP, while *Inflation* is defined as the annual growth rate of the GDP implicit deflator, where the GDP implicit deflator is the ratio of the GDP in current local currency to the GDP in constant local currency. Both variables are available from the World Bank Database. Finally, we control for the degree to which

outside investors are protected, following La Porta et al. (1997), La Porta et al. (1998), and Djankov al. (2008). In this respect, we use the investor protection index from the World Bank Database (*Investor Protection*).

In further tests and extensions, we also control for corporate governance and ownership structure variables, because they may affect bank financial reporting practices. These variables are related to the board size, the number of independent directors, ownership structure (i.e., if the bank is widely held), and potential CEO entrenchment.

We run regressions with robust standard errors clustered at the bank level (Petersen, 2009) to adjust for within-cluster serial correlation in the error term, consistent with previous studies in the banking literature (Chhaochharia and Laeven, 2009). To reduce the potential effect of multicollinearity, we also run the regressions separately for each of our main explanatory variables.

In Appendix A, we provide a more detailed description of the variables used in our empirical analysis.

5. Results

In Section 5.1, we provide the results for the aggregate effects of market reactions to announcements related to ELM. In section 5.2, we present the results of the cross-sectional determinants of the CARs.

5.1 Aggregate effects

Table 6 reports the first set of our results for the aggregate market reaction. We compute the total and average CARs for all thirteen events. In our estimations, we use both an equal-weighted portfolio and a market-weighted portfolio comprising the stocks of our sample banks. We use two estimation windows: one of 120 trading days and one of 90 trading days. To assess the statistical significance of the CARs, we compute bootstrapped p-values for the average CARs, based on 1,000 simulations.

[Insert Table 6 here]

The average CARs are positive and statistically significant at the 5% level or 1% level for the equal-weighted portfolio and market-weighted portfolio of sample banks. The same results hold when we use an event window (-1,1). The results remain very similar after excluding event #12. Notably, the price reaction is stronger for the market-weighted portfolio than for the equal-weighted portfolio, suggesting that larger banks react more positively to the introduction of the new accounting rule than smaller banks. This result is consistent with the results for *Size* reported in section 4.2.

Next, we repeat the analysis after excluding observations related to potential confounding events that may drive our findings. In this respect, we use the LEXIS/NEXIS database to search for concurrent news on event-dates for each bank in our sample. The results of Table 6 still hold after excluding bank-level confounding events from our sample.[14]

Finally, we also repeat the analysis considering only observations for which there is a value for *MES* to check the sensitivity of our results to data availability for the variable *MES* (for which data is available only for around 60 banks). Again, the results are very similar to those reported in Table 6.[15]

5.2 Cross-sectional determinants of CARs

Table 7 reports the results for the cross-sectional determinants of the market reactions for the event window (-1,1).[16]

[Insert Table 7 here]

We first run the regressions separately for each of the explanatory variables related to our hypotheses (from Column (1) – Column (8). Then, we run regressions with all our main variables together.

Our results for *ROA* are consistent with ***H2a***. The coefficient on *ROA* is negative and statistically significant at 10% in Column (1), but the significance improves (at the 5% level or better) for

[14] These results are available upon request.
[15] The result is available upon request.
[16] We obtain similar results when we use the event window (-1,1), although the results for *F-IRB* and *A-IRB* tend to become insignificant.

specifications including variables related to other hypotheses (Column (9) – Column (18). The coefficient remains significant at the 5% level (or better) even after controlling for bank fixed effects, country fixed effects, and year fixed effects. Thus, our results suggest that market participants perceive the benefits of IFRS 9 as more pronounced for banks with worse performance because they may be more likely to engage in risk-shifting activities (Bushman and Williams 2012).

We then test whether banks with higher systemic risk may react more positively (Bushman and Williams, 2015). In our estimations, we use three different proxies for systemic risk: *Size* defined as the log of total assets (Bayazitova and Shivdasani, 2012), *MES* (Acharya et al., 2012; Vallascas et al., 2017), and *Public Bailout* (Bayazitova and Shivdasani, 2012, Cardillo et al., 2020). *Size* enters the regressions with a positive and statistically significant coefficient in four out of six specifications. However, when we control for bank fixed effects, the coefficient on *Size* becomes insignificant. There are two potential explanations for this result. First, within-bank variation in *Size* (which is based on total assets) might be small. Second, *Size* is not able to measure the potential distress costs of bank defaults. Drehmann and Tarashev (2013) consider *Size* a rough indicator of systemic risk. When we use alternative systemic risk measures, *MES*, and *Public Bailout*, their coefficients are statistically significant at 5% (or better), as reported in the last four columns of Table 6.[17] The results for *Skewness* suggest that banks that tend to delay loss recognition react better to ELM announcements.[18]

The coefficient on *Discretionary LLP* is statistically insignificant. There are two possible explanations for this result. First, investors might find other variables included in our regressions

[17] We do not use these three proxies of systemic risk in the same model to avoid any potential multicollinearity problem.
[18] Since *Skewness* and *MES* can be considered measures of crash risk (Hutton et al., 2009; Acharya et al., 2012), we use these variables in separate regressions.

easier to observe and understand than *Discretionary LLP*. Second, since *Discretionary LLP* is highly-correlated with *ROA* and *MES*, there might be a multicollinearity problem.[19,20]

The coefficients on *F-IRB* and *A-IRB* are insignificant. Therefore, these results do not support the hypothesis that banks with IRB models face lower compliance costs and react better to the announcements (***H6***). However, this is also coherent with the idea that the impact of IFRS 9 is moderate for IRB banks.

Finally, the coefficient on *GIIPS* is not statistically significant when we run the model separately for each variable of our hypotheses. However, it becomes positive and significant at the 10% level in Column (13). Thus, there is some evidence that banks whose headquarters are in countries with higher sovereign debt risk react more positively to the new accounting rule.

We now move our attention to the control variables. We find that the coefficients on *CR5* enter all regressions with a positive sign, but the coefficients are statistically significant at 10% only in one column (Column (16)) of Table 7. Since more concentrated banking systems are more likely to suffer from TBTF problems, their explanatory power might be absorbed by systemic risk proxies. The results for *GDP Growth* suggest that the state of economy might have a positive impact on the returns of the stock market, including the returns of bank stocks. Similarly, *Inflation* is positively correlated with the CARs, in line with the view that banks benefit from higher growth in consumer prices (Heider et al., 2019) because they tend to lead to higher interest rates, which improve net profit margins. We also find that *Investor Protection* enters our regressions with a positive but statistically insignificant coefficient, probably because the European countries in our sample are not very heterogeneous in terms of the investor protection systems.

[19] *Discretionary LLP* is positively correlated with *MES* at 1% significance level (correlation coefficient = 0.5385), suggesting that banks with a higher systemic risk are more likely to use discretion in reporting loan loss provisions. *Discretionary LLP* is negatively correlated with *ROA* at 1% level (correlation coefficient = -0.2484). This result suggests that more profitable banks are less likely to use discretion, consistent with the view that banks use discretionary LLP to overstate earnings (Danisewicz et al., 2020).

[20] We also investigate whether the implementation of IFRS 9 in 2018 has had an impact on *Discretionary LLP*. Our results (untabulated but available upon request) show that the ELM implementation has increased the degree of discretion used by managers in loan loss provisioning practices, consistent with our expectations.

Table 8 shows the results after excluding bank-year observations for which there may be confounding events. The results are very similar across the two tables. In this respect, we use the LEXIS/NEXIS database to search for concurrent news on event-dates for each bank in our sample. Then, we re-estimate our main regressions after removing the bank-event observations for which there are confounding events (around 70 observations). Our results are robust to the exclusion of bank-year observations for which there may be confounding events.[21] Notably, the coefficients on *Size* and *Skewness* become now significant at 1%, underlying the fact that the exclusion of confounding events help explaining better the cross-sectional variation of the CARs.

[Insert Table 8 here]

5.3. Robustness checks

Previous literature provides evidence that board characteristics and managerial ownership may affect the probability of earnings management (Ng and Stoeckenius, 1979; Larcker et al., 2007; Barth et al., 2008; Dechow et al., 2010). Since the adoption of ELM increases managers' ability to use discretion in the reporting of credit risk (Gebhardt and Novotny-Farkas, 2011), we investigate whether corporate governance variables may help explain the variation in CARs. In particular, we perform additional regressions considering variables related to board size and independence, managerial entrenchment, and CEO gender. The first four variables might affect the degree to which managerial decisions are consistent with shareholder-value maximization, and CEO gender can affect earnings quality (Zalata et al., 2018). In particular, if ELM enhances market discipline, banks with better corporate governance should react less positively to the announcements. Following Yermack (1996), we expect that board size reduces firm performance, and, thus, it should be positively

[21] To improve robustness, we run the same regressions used for Table 6, Panel A, after excluding Systemically Important Financial Institutions (SIFIs), as listed in the document available at:
http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/574406/IPOL_BRI(2016)574406_EN.pdf.
We obtain virtually the same results as in Table 6, Panel A, although the coefficient on *Skewness* is statistically significant at the 10% level. The results are available upon request.
When we exclude observations about the event #12, the results remain unaltered and are available upon request. When we remove the confounding events from our sample, the coefficient on *Skewness* is statistically significant at the 10% level.

correlated with the CARs because firms with a larger board size might benefit from enhanced market discipline.

On the other hand, since board independence in banks tends to reduce bank risk (Vallascas et al., 2017), firms with a more independent board should benefit less from the ELM adoption than firms with a less independent board. Thus, board independence should correlate negatively with the CARs. Banks with entrenched CEOs should benefit from enhanced market discipline due to the ELM adoption, and thus CEO ownership (a proxy for CEO entrenchment) should increase the CARs. Finally, there is some evidence that female CEOs tend to be more risk-averse than their male counterparts, but they do not seem to be more ethical (Zalata et al., 2018). Since a higher degree of risk aversion might reduce the need for risk-shifting, firms with female CEOs might benefit less from the ELM adoption than those with male CEOs. For this reason, the variable *Female CEO* should be negatively correlated with the CARs.

The ownership structure might affect bank risk-taking because of potential monitoring from large, powerful shareholders (Shleifer and Vishny, 1986). In particular, large diversified shareholders have stronger incentives to increase risk than managers without an ownership stake. For this reason, we also add as a control variable the dummy *Widely Held* (Caprio et al., 2007; Laeven and Levine, 2009), which takes the value of one if there is no owner with more than 10% of banks share rights and zero otherwise.

To allow for the impact of internal monitoring mechanisms, we consider several variables related to board monitoring. First, we proxy for the size of the board of directors with the log of total members on the board, *Board Size (ln)* (Vallascas et al., 2017), and we proxy for *Board Independence* with the fraction of independent directors. For instance, Yermack (1996) find that smaller boards are more effective, while Vallascas et al. (2017) find that board independence reduces bank risk in the post-financial crisis period. This latter evidence is also coherent with the view that independent directors safeguard the bank creditors' interests by overseeing bank executives. Then, and following Onali et

al. (2016), we introduce as a measure of CEO entrenchment, *CEO Ownership*.[22] Finally, we also consider a measure of board members' entrenchment, *Board Ownership,* which is defined as the percentage of board members' share ownership. Furthermore, we also investigate whether gender differences may explain the variation in CARs, following previous literature documenting that CFO gender affects financial reporting choices (Francis et al., 2015). We include a dummy variable, which takes on the value of one if the bank has a female CEO and zero otherwise (*CEO Female*).

[Insert Table 9 here]

In Table 9, we report the results for robustness tests based on Table 6. The results remain very similar, although the coefficient on *GIIPS* becomes now significant at 1%.[23]

Furthermore, one may also argue that our results are sensitive to the presence of *systemically important financial institutions* (SIFIs) in our sample. For this reason, we exclude bank-year observations related to systemically important banks. Additionally, and along the same line of the analysis related to aggregate effects in Section 4.1 (Table 6), we also exclude from our estimations bank-year observations related to event #12. In both cases, the results remain qualitatively similar to those reported in Table 7.[24]

6. Conclusions

This study is the first attempt to understand whether changes in international accounting standards for loan loss provisions is an appropriate "cure" to restore confidence in banks' balance sheets among international investors.

[22] Onali et al. (2016) define *CEO Ownership* as the CEO's equity stake in the bank.
[23] In Appendix B, we run regressions adding interaction terms between variables related to performance and risk and variables usually related to corporate governance quality (board size and board independence, female CEO) and CEO entrenchment. Again, these regressions reiterate previous results, and most of the interaction terms are insignificant. Since larger banks are also likely to bear the additional compliance costs related to the ELM adoption, we interpret these results as evidence that the compliance cost channel might be at the root of these findings. The only exception is the interaction term *Female CEO * Size*, which is positive, suggesting that for banks with a female CEO, the impact of *Size* on the CARs is amplified.
[24] Both results are available upon request.

We employ event study methodology to investigate whether the international investors have perceived the ELM introduction as value-enhancing. We test this hypothesis on a sample of European listed banks domiciled in countries where IFRSs are mandatory, encompassing 13 announcements related to the standard-setting process of IFRS 9.

Our findings suggest that there is an overall positive reaction to ELM announcements. Moreover, we examine the cross-sectional determinants of the CARs and provide evidence that banks with lower profitability, higher systemic risk, higher sovereign debt risk, and higher skewness in stock returns (which proxies for the tendency to delay bad news) react more positively to ELM announcements. These results are robust to a battery of robustness checks: different lengths of the estimation window, the exclusion of SIFIs from the sample, the exclusion of observations for which there are potentially confounding events, and the inclusion of corporate governance variables in the regressions.

Our results suggest that investors perceive that the shift from ILM to ELM will improve market discipline and financial reporting quality. It is unlikely that it will lead to opportunistic behavior. Such benefits might offset the increase in compliance costs, especially for large banks. This interpretation is consistent with the view that the ELM introduced by IFRS 9 improves the alignment between financial reporting rules and international bank regulation (Basel Accord) because of a broader set of information to estimate future expected credit losses. Our results also indicate that the ELM improves the timeliness of impairment recognition and strengthens bank capital because it reduces the probability of overstatement of earnings. By constraining earnings overstatement, the ELM should also curb risk-shifting problems related to dividend payments and performance-based compensation, reinforcing the impact of Basel III proposals concerning restrictions on dividends and bonuses in under-capitalized banks. Such benefits appear to be particularly important for systemically-risky banks, suggesting that the increased market discipline will benefit the overall banking system.

However, our paper is subject to the limitations of event studies: our findings are valid to the extent that market perceptions about the ELM, as measured by the estimated price reaction to ELM

announcements, are correct. Future work in this area should aim to further develop this strand of research by assessing the impact of ELM at a later stage when its long-term consequences unfold. However, this type of empirical analysis will only be possible years after the implementation of ELM.

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Table 1
IFRS 9, IAS 39, and Basel III rules.

IFRS 9	IAS 39	Basel III
Impairment model:	**Impairment model:**	**Credit risk model:**
Stage 1 (*Performing financial instrument*). Financial assets with high credit quality with a significant increase in credit risk since initial recognition, or with low credit risk at the reporting date. Impairment provision is determined on a 12-month expected loss on the gross book value of the exposure.		
Stage 2 (*Deteriorated financial instrument*). Financial assets with a significant increase in credit risk since the initial recognition. Impairment provision is determined based on lifetime expected loss.		
Stage 3 (*Non-performing financial instrument*). Financial assets with objective evidence of impairment at the reporting date. Impairment provision is determined based on the lifetime expected credit losses on the net book value of the exposure.	Need for "objective evidence of impairment", with a clearly observable loss event. "Trigger events" as indicators of objective evidence are provided by the standard (non-exclusive list).	
Probability of Default (PD) estimation: Estimation of PD considers different time horizons, depending on whether the instrument is classified in Stage 1 (next 12 months) or Stage 2-3 (remaining life).		*Probability of Default (PD) estimation:* The estimation of PD is based on the average default in 12 months.

Sources: IASB (2014c). IFRS 9 Financial Instruments – project summary; Onali and Ginesti (2015); Temim (2016), Humblot (2018).

Table 2

Reaction to the new regulation

This table summarizes the potential relationships between the predicted coefficient under each hypothesis and the corresponding theoretical channel.

Channels Variables	Monitoring channel	Compliance cost channel	Opportunistic behavior channel
Aggregate reaction	+ *(H1a)*	- *(H1b)*	- *(H1c)*
Bank profitability	- *(H2a)*	+ *(H2b)*	+ *(H2c)*
Systemic risk	+ *(H3a)*	+ *(H3b)*	- *(H3c)*
Sovereign debt risk	+ *(H4a)*	+ *(H4b)*	- *(H4c)*
Delayed loss recognition	+ *(H5)*		
IRB models		+ *(H6)*	

Table 3
Sample composition

Code	*Country*	*Number of Banks*
AT	Austria	6
BE	Belgium	3
DE	Germany	14
DK	Denmark	21
ES	Spain	7
FI	Finland	2
FR	France	18
GR	Greece	6
IE	Ireland	2
IT	Italy	18
LU	Luxembourg	1
NL	Netherlands	3
PT	Portugal	3
SE	Sweden	4
UK	United Kingdom	7
	Total	*115*

Table 4

Descriptive statistics

Notes: mean (*Mean*), median (*Median*) standard deviation (*SD*), the minimum (*Min*), and the maximum (*Max*).

Main independent variables						
	Obs.	*Mean*	*Median*	*SD*	*Min*	*Max*
ROA	1440	0.0014	0.0039	0.0145	-0.0903	0.0290
Size	1440	17.1703	17.1136	2.3889	12.3156	21.4155
MES	806	3.4270	3.4200	1.3129	0.7900	8.3600
Public Bailout	1471	0.3535	0.0000	0.4782	0.0000	1.0000
Skewness	1469	0.1202	0.0871	0.8741	-3.2134	2.6569
IRB	949	0.5342	1.0000	0.4991	0.0000	1.0000
A-IRB	949	0.4795	0.0000	0.4998	0.0000	1.0000
GIIPS	1471	0.3018	0.0000	0.4592	0.0000	1.0000
Discretionary LLP	451	0.0082	0.0100	0.0207	-0.0444	0.0747
Macroeconomic and institutional variables						
	Obs.	*Mean*	*Median*	*SD*	*Min*	*Max*
CR5	1471	0.8221	0.8287	0.0964	0.4271	0.9988
GDP Growth	937	0.0042	0.0076	0.0248	-0.0913	0.0599
Inflation	1471	0.0109	0.0103	0.0085	-0.0456	0.0477
Investor Protection	1471	17.2522	17.0000	2.9496	10.0000	26.0000
Ownership structure and corporate governance variables						
	Obs.	*Mean*	*Median*	*SD*	*Min*	*Max*
Widely Held	934	0.2827	0.0000	0.4505	0.0000	1.0000
Board Independence	933	0.5220	0.5600	0.2688	0.0000	1.0000
Board size	933	2.6471	2.7081	0.3491	1.7918	3.2189
CEO Ownership	923	1.0834	0.0020	6.7554	0.0000	53.7000
Board Ownership	923	3.9058	0.0250	12.6507	0.0000	75.1827
Female CEO	934	0.0396	0.0000	0.1952	0.0000	1.0000

Table 5

Event dates

The table shows the ELM adoption announcements from 2009 to 2014. Panel A reports the date and the description of each event. Panel B reports the number of events for each year.[a] Event for which the likelihood of adoption and implementation of IFRS 9 according to the original schedule proposed by IASB has decreased.

Panel A: Event dates and Description of the Events

Number	*Date*	*Event*	*Probability of IFRS 9 adoption*
1	November 12, 2009	IASB issues the first phase of the development of IFRS 9 emphasizing the benefits for investors of the new approach for the impairment.	*Increase*
2	January 13, 2011	IASB and FASB announce the intention to publish a joint proposal on credit impairment of loans and other financial assets.	*Increase*
3	January 31, 2011	IASB and FASB publish a joint proposal on accounting for impairment of financial assets.	*Increase*
4	March 4, 2011	EFRAG recognizes the tentative decisions of FASB and IASB to adopt a common expected-loss model for impairment and calls the two boards to develop a high-quality converged standard.	*Increase*
5[a]	April 8, 2011	EFRAG releases the final comment letter to IASB in response to Supplementary Document Financial Instruments: Impairment issued on January 31, 2011.	**Decrease**
6[a]	August 4, 2011	IASB proposes to delay the effective date of IFRS 9 from January 1, 2013, to January 1, 2015.	**Decrease**
7	December 16, 2011	IASB releases amendments deferring the mandatory effective date from January 1, 2013, to January 1, 2015.	*Increase*
8	January 27, 2012	IASB and FASB announce their intention to continue developing a common approach for the impairment model.	*Increase*
9	March 7, 2013	IASB publishes revised proposal for loan-loss provisioning.	*Increase*
10	July 9, 2013	IASB publishes its comment letter in response to IASB ED- Financial Instruments: Expected Credit Losses.	*Increase*
11	July 22, 2013	EFRAG reports the findings of a field test on IASB ED- Financial Instruments: Expected Credit Losses. The field-test serves also as an input to the European Commission's endorsement process.	*Increase*
12	July 10, 2014	The president of the ECB urges policymakers in Europe to progress in the adoption of IFRS 9 during the IFRS Foundation Trustees' meeting in London.	*Increase*
13	July 24, 2014	IASB issues the final version of IFRS 9.	*Increase*

Panel B: Events Distribution

Year	*Number of Event(s)*
2009	1
2010	None
2011	6
2012	1
2013	3
2014	2

Table 6

Market reaction to ELM announcements.

This table presents event study results for ELM announcements based on equal-weighted (EW) and market-weighted (MW) portfolios of our sample banks using an estimation window of either 120 days (EW(120) and MW(120)) or 90 days (EW(90) and MW(90)). We present CARs for the event windows: (-2;2) – in Section 1 of the table (on the left) – and (-1;1) – in Section 2 of the table (on the right). Panel A reports the CARs for each event. Panel B reports the estimates of the Total CAR and Average CAR for all 13 events, while Panel C reports the estimates of the Total CAR and Average CAR excluding event #12. We use DJ STOXX Global 1800 Ex Europe as a proxy for the market portfolio. The CARs are estimated according to Equations (1) and (2). "Bootstrapped p-value" is the *p-value* for the average CAR calculated according to 1,000 bootstrap simulations for the period July 3, 2009 – August 5, 2014. For each simulation, we estimate the average CAR for 13 (Panel B) or 12 (Panel C) placebo events, using randomly selected trading days. The *p-values* are computed based on the number of cases for which the CARs for the placebo events are larger or smaller than the estimated value (2-tail tests). ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

	Section 1 – Event window: (-2, 2)				**Section 2 – Event window: (-1, 1)**			
Event #	EW(120)	MW(120)	EW(90)	MW(90)	EW(120)	MW(120)	EW(90)	MW(90)
Panel A: Results for each of the 13 events								
1	-0.0155	0.0106	-0.0237	0.0011	-0.0050	0.0043	-0.0093	-0.0010
2	0.0469	0.0911	0.0464	0.0912	0.0422	0.0880	0.0376	0.0811
3	0.0238	0.0343	0.0216	0.0336	0.0168	0.0157	0.0166	0.0173
4	-0.0081	-0.0103	-0.0088	-0.0126	-0.0016	-0.0095	-0.0025	-0.0115
5	-0.0115	-0.0269	-0.0102	-0.0231	-0.0051	-0.0142	-0.0038	-0.0118
6	0.0873	0.1083	0.0980	0.1260	0.0450	0.0753	0.0454	0.0790
7	0.0180	0.0194	0.0189	0.0203	0.0232	0.0357	0.0263	0.0401
8	0.0502	0.0041	0.0458	-0.0052	0.0296	0.0076	0.0257	-0.0009
9	0.0102	0.0284	0.0089	0.0254	0.0033	0.0123	0.0027	0.0105
10	-0.0075	0.0098	-0.0084	0.0103	-0.0031	0.0133	-0.0036	0.0127
11	0.0376	0.0428	0.0371	0.0436	0.0119	0.0029	0.0136	0.0049
12	-0.0209	-0.0245	-0.0207	-0.0242	-0.0083	-0.0105	-0.0079	-0.0109
13	0.0227	0.0383	0.0250	0.0395	0.0207	0.0292	0.0202	0.0276
Panel B: Cumulative results for all 13 events								
Total CAR	0.2335	0.3253	0.2299	0.3259	0.1697	0.2499	0.1610	0.2370
Average CAR	0.0180***	0.0250***	0.0177***	0.0251***	0.0131**	0.0192**	0.0124**	0.0182**
Bootstrapped p-value	0.0060	0.0080	0.0060	0.0100	0.0240	0.0200	0.0320	0.0220
Panel C: Cumulative results excluding event #12								
Total CAR	0.2544	0.3498	0.2506	0.3501	0.1779	0.2604	0.1689	0.2479
Average CAR	0.0212***	0.0291***	0.0209***	0.0292***	0.0148***	0.0217***	0.0141***	0.0207***
Bootstrapped p-value	0.0040	0.0020	0.0060	0.0040	0.0040	0.0080	0.0060	0.0060

Table 7

Main Results: *Determinants of CARs*

This table reports the results of regressions estimated according to Equation (3), where the CARs are the dependent variable and are estimated according to Equations (1) and (2). The table uses the DJ STOXX Global 1800 Index Ex Europe as a proxy for the market portfolio. In Panel A, we consider all observations. In Panel B, we exclude observations for which there are potential confounding events. *ROA* is calculated as net income scaled by total assets. *Size* is the log of total assets. *MES* is the marginal expected shortfall of a bank stock given that the market return is below its 5th percentile. *Public Bailout* is an indicator equal to one if a bank receives a public bailout - *Capital Injections*, *Credit Lines*, and *Guarantees* – in a certain year during the period 2007-2013 and zero otherwise. *GIIPS* is a dummy variable equal to one for banks whose headquarters are located in Greece, Ireland, Italy, Portugal, or Spain. *Skewness* is calculated as the monthly skewness of daily stock returns. *F-IRB* is a dummy variable equal to one for banks that adopt foundation-IRB and zero otherwise. *A-IRB* is a dummy variable equal to one for banks that adopt advanced-IRB and zero otherwise. *CR5* is the assets of the five largest banks as a share of total commercial banking assets. *GDP Growth* is measured as the growth rate of the real GDP, while *Inflation* is measured by the annual growth rate of the GDP implicit deflator, where the GDP implicit deflator is the ratio of the GDP in current local currency to the GDP in constant local currency. *Investor Protection* is the investor protection index from the World Bank database and is measured as the sum of the extent of disclosure index, the extent of director liability index, and the ease of shareholder suits index. Constant included but not reported. All variables are winsorized at the 1% level. T-statistics are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	*(1)* *CAR (-1,1)*	*(2)* *CAR (-1,1)*	*(3)* *CAR (-1,1)*	*(4)* *CAR (-1,1)*	*(5)* *CAR (-1,1)*	*(6)* *CAR (-1,1)*	*(7)* *CAR (-1,1)*	*(8)* *CAR (-1,1)*
ROA	-0.2011*							
	(-1.8373)							
Size		0.0033***						
		(6.7068)						
MES			0.0059***					
			(7.1318)					
Public Bailout				0.0068**				
				(2.2042)				
Skewness					0.0035**			
					(2.1480)			
F-IRB						0.0051*		
						(1.7743)		
A-IRB							0.0085***	
							(3.4376)	
GIIPS								0.0109
								(0.8639)
CR5	0.0004	0.0004	0.0004	0.0002	0.0006	0.0004	0.0004	0.0004
	(0.5316)	(0.5363)	(0.6802)	(1.4164)	(0.9440)	(0.6486)	(0.6418)	(0.6529)
GDP Growth	-0.2297***	-0.2658***	-0.2607***	-0.3370***	-0.2677***	-0.2539***	-0.2559***	-0.2516***
	(-2.6259)	(-2.8507)	(-3.0282)	(-5.2427)	(-2.8967)	(-2.6787)	(-2.6970)	(-2.6696)
Inflation	0.4498*	0.4124*	0.2045	0.2952	0.4624*	0.4401*	0.4352*	0.4477*
	(1.8304)	(1.6617)	(1.0112)	(1.5041)	(1.9154)	(1.7748)	(1.7506)	(1.8096)
Investor Protection	-0.0032	-0.0032	-0.0029	0.0003	-0.0028	-0.0033	-0.0033	-0.0034
	(-1.2885)	(-1.2156)	(-1.2207)	(0.6851)	(-1.0353)	(-1.2233)	(-1.1992)	(-1.2563)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	930	930	806	937	935	937	937	937
Number of banks	73	73	63	73	73	73	73	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank FEs	No	No	No	No	No	No	No	No

Table 7 continued

Variables	*(9) CAR (-1,1)*	*(10) CAR (-1,1)*	*(11) CAR (-1,1)*	*(12) CAR (-1,1)*	*(13) CAR (-1,1)*	*(14) CAR (-1,1)*	*(15) CAR (-1,1)*	*(16) CAR (-1,1)*	*(17) CAR (-1,1)*
ROA	-0.1978**	-0.4186**	-0.1961**	-0.1759*	-0.8922**	-0.2895*	-0.3693**	-0.8808**	-0.2423**
	(-2.1609)	(-2.6321)	(-2.1763)	(-1.9552)	(-2.3383)	(-1.7953)	(-2.2653)	(-2.5501)	(-2.5140)
Size	0.0036***	0.0008	0.0031***	0.0032***	0.0054				
	(6.1946)	(0.0628)	(5.1667)	(5.4909)	(1.4949)				
MES						0.0063***	0.0054***	0.0061***	
						(6.2284)	(6.1814)	(3.0797)	
Public Bailout									0.0066**
									(2.0656)
Skewness	0.0042**	0.0042**	0.0041**						
	(2.5287)	(2.4085)	(2.5371)						
F-IRB	-0.0015			-0.0029	-0.0005	-0.0006		0.0002	
	(-0.5815)			(-1.0210)	(-0.1381)	(-0.2198)		(0.0613)	
A-IRB			0.0025	0.0037	0.0034		0.0014	0.0004	
			(1.0300)	(1.3757)	(0.7522)		(0.7262)	(0.1253)	
GIIPS				0.0065	0.0089*				
				(0.5827)	(1.7291)				
Discretionary LLP					-0.1072			0.1399	
					(-0.2917)			(1.0171)	
CR5	0.0005	0.0005	0.0005	0.0003	0.0003	0.0001	0.0003	0.0067*	0.0002
	(0.8176)	(0.7919)	(0.8162)	(0.4950)	(1.5719)	(1.0856)	(0.5023)	(1.7139)	(1.2444)
GDP Growth	-0.2566***	-0.2541***	-0.2575***	-0.2416***	-0.3299***	-0.3238***	-0.2335***	-0.0992	-0.2865***
	(-3.0581)	(-3.1615)	(-3.0615)	(-2.7749)	(-4.2495)	(-6.3722)	(-2.8913)	(-0.3055)	(-4.3326)
Inflation	0.4557*	0.4564*	0.4519*	0.4312*	0.4287*	0.2918**	0.2116	-0.5451	0.3206
	(1.9375)	(1.9062)	(1.9132)	(1.7665)	(1.6825)	(2.0752)	(1.0279)	(-0.5896)	(1.6324)
Investor Protection	-0.0022	-0.0014	-0.0021	-0.0030	-0.0005	0.0001	-0.0030	-0.0447**	0.0002
	(-0.9147)	(-0.6014)	(-0.8963)	(-1.2289)	(-1.0499)	(0.3000)	(-1.2169)	(-1.9644)	(0.4959)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	930	930	930	930	398	801	801	369	930
Number of banks	73	73	73	73	58	63	63	53	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
Bank FEs	No	Yes	No	No	No	No	No	Yes	No

Table 8

Robustness tests: *Excluding confounding events*

This table reports the results of regressions estimated according to Equation (3), where the CARs are the dependent variable and are estimated according to Equations (1) and (2). The table uses the DJ STOXX Global 1800 Index Ex Europe as a proxy for the market portfolio. In this table, we exclude observations for which there are potential confounding events. *ROA* is calculated as net income scaled by total assets. *Size* is the log of total assets. *MES* is the marginal expected shortfall of a bank stock given that the market return is below its 5th percentile. *Public Bailout* is an indicator equal to one if a bank receives a public bailout - *Capital Injections*, *Credit Lines*, and *Guarantees* – in a certain year during the period 2007-2013 and zero otherwise. *GIIPS* is a dummy variable equal to one for banks whose headquarters are located in Greece, Ireland, Italy, Portugal, or Spain. *Skewness* is calculated as the monthly skewness of daily stock returns. *F-IRB* is a dummy variable equal to one for banks that adopt foundation-IRB and zero otherwise. *A-IRB* is a dummy variable equal to one for banks that adopt advanced IRB and zero otherwise. *CR5* is the assets of the five largest banks as a share of total commercial banking assets. *GDP Growth* is measured as the growth rate of the real GDP, while *Inflation* is measured by the annual growth rate of the GDP implicit deflator, where the GDP implicit deflator is the ratio of the GDP in current local currency to the GDP in constant local currency. *Investor Protection* is the investor protection index from the World Bank database and is measured as the sum of the extent of disclosure index, the extent of director liability index, and the ease of shareholder suits index. Constant included but not reported. The regressions include a set of year- and country -fixed effects. All variables are winsorized at the 1% level. T-statistics are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) *CAR (-1,1)*	(2) *CAR (-1,1)*	(3) *CAR (-1,1)*	(4) *CAR (-1,1)*	(5) *CAR (-1,1)*	(6) *CAR (-1,1)*	(7) *CAR (-1,1)*	(8) *CAR (-1,1)*
ROA	-0.2559**							
	(-2.0271)							
Size		0.0034***						
		(7.0301)						
MES			0.0055***					
			(6.2748)					
Public Bailout				0.0062*				
				(1.9290)				
Skewness					0.0035**			
					(2.1769)			
F-IRB						0.0059**		
						(2.0395)		
A-IRB							0.0083***	
							(3.2071)	
GIIPS								0.0141
								(1.1646)
Discretionary LLP								
CR5	0.0002	0.0003	0.0003	0.0001	0.0005	0.0003	0.0003	0.0003
	(0.3271)	(0.3609)	(0.4410)	(0.9742)	(0.7598)	(0.4640)	(0.4434)	(0.4736)
GDP Growth	-0.2349**	-0.2798***	-0.2695***	-0.3522***	-0.2825***	-0.2695**	-0.2705**	-0.2660**
	(-2.3338)	(-2.6682)	(-2.6868)	(-5.9617)	(-2.6929)	(-2.4997)	(-2.5115)	(-2.4893)
Inflation	0.4633*	0.4309	0.2211	0.3192*	0.4824*	0.4590*	0.4501*	0.4648*
	(1.7572)	(1.6245)	(1.0113)	(1.6473)	(1.8753)	(1.7390)	(1.7003)	(1.7642)
Investor Protection	-0.0038*	-0.0037	-0.0036	0.0006	-0.0033	-0.0039	-0.0039	-0.0040
	(-1.9415)	(-1.5242)	(-1.5642)	(1.2574)	(-1.3837)	(-1.5784)	(-1.5698)	(-1.6226)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	893	893	770	900	898	900	900	900
Number of banks	73	73	63	73	73	73	73	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank FEs	No	No	No	No	No	No	No	No

Table 8 continued

Variables	*(9) CAR (-1,1)*	*(10) CAR (-1,1)*	*(11) CAR (-1,1)*	*(12) CAR (-1,1)*	*(13) CAR (-1,1)*	*(14) CAR (-1,1)*	*(15) CAR (-1,1)*	*(16) CAR (-1,1)*	*(17) CAR (-1,1)*
ROA	-0.2514**	-0.4615***	-0.2500**	-0.2327**	-0.8962**	-0.3366*	-0.4765***	-0.9342**	-0.2780***
	(-2.2369)	(-2.7656)	(-2.2587)	(-2.1256)	(-2.2333)	(-1.8073)	(-2.7102)	(-2.4419)	(-2.5925)
Size	0.0035***	-0.0042	0.0032***	0.0032***	0.0069*				
	(6.0309)	(-0.3247)	(5.3982)	(5.3056)	(1.9103)				
MES						0.0059***	0.0050***	0.0066***	
						(5.5025)	(5.5121)	(3.4184)	
Public Bailout									0.0060*
									(1.8033)
Skewness	0.0042***	0.0044**	0.0042***						
	(2.6041)	(2.5138)	(2.6145)						
F-IRB	-0.0005			-0.0016	0.0002	-0.0004		0.0029	
	(-0.2119)			(-0.5763)	(0.0565)	(-0.1246)		(0.7764)	
A-IRB			0.0022	0.0028	0.0013		0.0010	-0.0025	
			(0.8807)	(1.0781)	(0.3038)		(0.4750)	(-0.6233)	
GIIPS				0.0103	0.0095*				
				(1.0016)	(1.7057)				
Discretionary LLP					-0.2209			0.1150	
					(-0.6031)			(0.7669)	
CR5	0.0004	0.0004	0.0004	0.0002	0.0002	0.0000	0.0001	0.0080*	0.0001
	(0.6086)	(0.6634)	(0.6018)	(0.2861)	(0.9247)	(0.4214)	(0.2159)	(1.8051)	(0.7985)
GDP Growth	-0.2624***	-0.2762***	-0.2633***	-0.2462**	-0.3468***	-0.3283***	-0.2299**	-0.1778	-0.2918***
	(-2.7425)	(-3.0821)	(-2.7482)	(-2.4793)	(-4.1667)	(-5.6747)	(-2.3831)	(-0.4877)	(-4.3347)
Inflation	0.4730*	0.5030*	0.4701*	0.4449*	0.3469	0.3168**	0.2184	-0.4504	0.3513*
	(1.8725)	(1.9684)	(1.8552)	(1.6975)	(1.2034)	(2.3467)	(0.9620)	(-0.4734)	(1.8311)
Investor Protection	-0.0027	-0.0024	-0.0026	-0.0035*	-0.0001	0.0004	-0.0041**	-0.0499**	0.0005
	(-1.4159)	(-1.4127)	(-1.4047)	(-1.7815)	(-0.1019)	(1.0078)	(-1.9743)	(-1.9725)	(1.0432)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	893	893	893	893	374	765	765	346	893
Number of banks	73	73	73	73	58	63	63	53	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
Bank FEs	No	Yes	No	No	No	No	No	Yes	No

Table 9

Robustness tests: ***Determinants of CARs and corporate governance variables***

This table reports the results of regressions where the CARs are the dependent variable (estimated according to Equations (1) and (2)). The table uses the DJ STOXX Global 1800 Index Ex Europe as a proxy for the market portfolio. We include the following corporate governance and ownership structure variables: *Widely Held*, *Board Independence*, *Board Size (ln)*, *CEO Ownership*, *Board Ownership*, *Female CEO*. Constant included but not reported. All variables are winsorized at the 1% level. T-statistics are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)
	CAR	*CAR*	*CAR*	*CAR*	*CAR*	*CAR*	*CAR*	*CAR*
VARIABLES	*(-1,1)*	*(-1,1)*	*(-1,1)*	*(-1,1)*	*(-1,1)*	*(-1,1)*	*(-1,1)*	*(-1,1)*
ROA	-0.2369**	-0.4452**	-0.2322**	-0.9579**	-0.2889	-0.4326**	-1.0271**	-0.2271**
	(-2.3371)	(-2.4507)	(-2.3192)	(-2.4463)	(-1.5630)	(-2.2576)	(-2.4961)	(-2.5131)
Size	0.0058***	0.0015	0.0053***	0.0087**				
	(5.7696)	(0.1188)	(5.5354)	(2.1207)				
MES					0.0063***	0.0057***	0.0068***	
					(5.2821)	(5.7888)	(3.3490)	
Public Bailout								0.0058*
								(1.6971)
Skewness	0.0041**	0.0044**	0.0040**					
	(2.4540)	(2.4454)	(2.4553)					
IRB	-0.0021			-0.0012	0.0002		0.0023	
	(-0.8518)			(-0.2860)	(0.0881)		(0.5669)	
AIRB			0.0028	0.0027		0.0021	-0.0040	
			(1.0699)	(0.5713)		(0.9234)	(-0.8899)	
GIIPS				0.0147***				
				(2.6302)				
Discretionary LLP				-0.1573			0.0914	
				(-0.3967)			(0.4934)	
Widely Held	-0.0002	-0.0065	-0.0003	-0.0030	-0.0000	0.0003	0.0043	0.0019
	(-0.0511)	(-1.3362)	(-0.0896)	(-0.8120)	(-0.0125)	(0.1093)	(0.9583)	(0.5305)
Board Independence	-0.0000	-0.0176**	-0.0020	-0.0010	-0.0048	-0.0030	0.0036	-0.0001
	(-0.0057)	(-2.0106)	(-0.3026)	(-0.1043)	(-0.7847)	(-0.3970)	(0.2803)	(-0.0160)
Board Size (ln)	-0.0168***	-0.0183	-0.0173***	-0.0136*	-0.0036	-0.0082*	-0.0100	0.0036
	(-2.8082)	(-1.3336)	(-2.8204)	(-1.9002)	(-1.1413)	(-1.8037)	(-1.2770)	(0.7896)
CEO Ownership	0.0002	0.0022	0.0001	0.0006***	0.0036	-0.0058	-0.0733*	-0.0005***
	(1.0742)	(0.3507)	(0.9917)	(2.6213)	(0.3746)	(-0.4208)	(-1.7410)	(-3.3081)
Board Ownership	0.0000	-0.0035***	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0001
	(0.3141)	(-3.2049)	(0.3335)	(-0.7614)	(-0.6308)	(-1.5625)	(0.2884)	(0.9908)
Female CEO	0.0034	0.0055	0.0007	0.0046	-0.0002	0.0002	0.0039	0.0015
	(1.2010)	(0.6828)	(0.2173)	(1.1021)	(-0.0400)	(0.0876)	(0.9308)	(0.3512)
CR5	0.0006	0.0008	0.0006	0.0003	0.0000	0.0004	0.0070	0.0002
	(0.9176)	(1.3466)	(0.9188)	(1.4596)	(0.3178)	(0.5724)	(1.5341)	(1.3772)
GDP Growth	-0.2925***	-0.2817***	-0.2922***	-0.2838***	-0.3209***	-0.2452**	-0.1934	-0.3102***
	(-3.0994)	(-3.2008)	(-3.0800)	(-3.3511)	(-6.3124)	(-2.5159)	(-0.5119)	(-4.6789)
Inflation	0.5331**	0.4764*	0.5209**	0.6501**	0.2462	0.2163	-0.3988	0.3717*
	(2.0511)	(1.7324)	(1.9908)	(2.2023)	(1.5902)	(0.9539)	(-0.4246)	(1.7729)
Investor Protection	-0.0009	-0.0021	-0.0009	-0.0012**	0.0003	-0.0026	-0.0451*	0.0007*
	(-0.3743)	(-0.8421)	(-0.3881)	(-2.0173)	(0.9593)	(-0.9933)	(-1.7310)	(1.7272)
Observations	880	880	880	391	758	758	340	880
Number of banks	73	73	73	58	63	63	53	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Bank FEs	No	Yes	No	No	No	No	No	No

Appendix A
Definition of variables and data sources

Variables	*Definition(s)*	*Sources*
Variables to test our main hypothesis		
ROA	Return on Total Assets	Bankscope
Size	Log of Total Assets	Bankscope
MES	*MES* is the marginal expected shortfall of a stock given that the market return is below its 5th percentile.	V-Stern Lab
Public Bailout	Dummy variable: 1 if the bank receives any kind of public bailout at time *t*, 0 otherwise	Mediobanca
Skewness	Monthly skewness of stock returns	Authors' calculations
F-IRB	Dummy variable: 1 if the bank adopts a foundation IRB model, 0 otherwise	Annual reports
A-IRB	Dummy variable: 1 if the bank adopts an advanced IRB model, 0 otherwise	Annual reports
GIIPS	Dummy variable: 1 if the bank's headquarters are located in Greece, Ireland, Italy, Portugal or Spain	Bankscope
Other control variables and variable used in the empirical tests		
Discretionary LLP	Residual component of the model by Nichols et al. (2009) – see equation (4)	Authors' calculations based on data from Bankscope
CR5	Assets of five largest banks as a share of total commercial banking assets	World Bank Database
GDP Growth	Growth rate of the real GDP	World Bank Database
Inflation	Annual growth rate of the GDP implicit deflator	World Bank Database
Investor Protection	Sum of the extent of disclosure index, the extent of director liability index and ease of shareholder suits index	World Bank Database
Ownership and corporate governance variables		
Widely Held	Dummy variable: 1 if there is no owner with more than 10% of bank share rights and 0 otherwise	Annual reports
Board Size (ln)	Log of the number of board members.	Authors' calculations
Board Independence	The percentage of independent directors on the board.	Annual reports
Female CEO	Dummy variable: 1 if the bank CEO is female, 0 otherwise.	Annual reports
CEO ownership	CEO equity stake in the bank, expressed as a percentage.	Annual reports
Board Ownership	Board members' equity stake in the bank, expressed as a percentage.	Annual reports

Appendix B

Robustness tests: ***Determinants of CARs and moderation effect of corporate governance mechanisms for bank performance*.**

This table reports the results of regressions where the CARs are the dependent variable (estimated according to Equations (1) and (2)), and the independent variables are the interaction terms between the variables related to bank performance and the bank corporate governance characteristics. The table uses the DJ STOXX Global 1800 Index Ex Europe as a proxy for the market portfolio. *High Board Size* is a dummy variable that takes the value of one if the value for *Board Size (ln)* is higher than the sample median. *High Board Independence* is a dummy variable that takes the value of one if the bank has a fraction of independent directors higher than the sample median. *High CEO ownership* is a dummy variable that takes the value of one if the CEO has an equity stake in the bank higher than the sample median. *Female CEO* is a dummy variable that takes the value of one if the bank CEO is female. The regressions also include institutional and macroeconomic control variables, such as *CR5* (the assets of five largest banks as a share of total commercial banking assets), *GDP Growth* (growth rate of the real GDP), *Inflation* (the annual growth rate of the GDP implicit deflator), and *Investor Protection* (sum of the extent of disclosure index, the extent of director liability index and ease of shareholder suits index). Constant included but not reported. All variables are winsorized at the 1% level. T-statistics are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

VARIABLES	(1) CARs	(2) CARs	(3) CARs	(4) CARs	(5) CARs	(6) CARs	(7) CARs	(8) CARs	(9) CARs
Size	0.0044***	0.0029***	0.0044***						
	(4.8818)	(4.3871)	(3.6447)						
Size*High Board Size	0.0010		0.0006						
	(0.7870)		(0.5107)						
Size* High Board Independence	-0.0004		-0.0007						
	(-0.3829)		(-0.6082)						
Size* High CEO ownership		0.0008	0.0008						
		(0.9217)	(0.7274)						
Size*Female CEO			0.0049**						
			(2.1250)						
MES				0.0092***	0.0065***	0.0100***			
				(5.3111)	(6.5416)	(4.8689)			
MES*High Board Size				-0.0022		-0.0029			
				(-1.3509)		(-1.5372)			
MES*High Board Independence				-0.0020		-0.0017			
				(-1.2832)		(-1.0695)			
MES*High CEO ownership					-0.0018	-0.0018			
					(-1.0928)	(-0.9045)			
MES*Female CEO						-0.0050			
						(-1.5166)			
Skewness							0.0068*	0.0055**	0.0101***
							(1.9286)	(2.4827)	(2.6575)
Skew* High Board Size							-0.0021		-0.0032
							(-0.6569)		(-1.0127)
Skew* High Board Independence							-0.0039		-0.0044
							(-1.1668)		(-1.2803)
Skew* High CEO ownership								-0.0050	-0.0065*
								(-1.5011)	(-1.7818)
Skew*Female CEO									0.0104*
									(1.7498)
High Board Size	-0.0259		-0.0211	0.0027		0.0043	0.0019		0.0015
	(-1.1156)		(-0.8871)	(0.4658)		(0.7036)	(0.5773)		(0.4212)
High Board Independence	0.0022		0.0078	0.0002		-0.0009	-0.0006		-0.0003
	(0.1148)		(0.3515)	(0.0303)		(-0.1694)	(-0.2306)		(-0.1201)
High CEO ownership		-0.0134	-0.0119		0.0065	0.0084		0.0032	0.0033
		(-0.8847)	(-0.6156)		(0.9904)	(1.0411)		(1.2156)	(1.1283)
Female CEO			-0.0845**			0.0175			0.0007
			(-1.9799)			(1.4723)			(0.2583)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	930	930	927	806	806	805	935	935	932
Number of bank	73	73	73	63	63	63	73	73	73
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes