How post-crisis regulation has affected bank CEO compensation*

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Abstract

This paper assesses whether compensation practices for bank Chief Executive Officers (CEOs) changed after the Financial Stability Board (FSB) issued post-crisis guidelines on sound compensation. Banks in jurisdictions which implemented the FSB's Principles and Standards of Sound Compensation in national legislation changed their compensation policies more than other banks. Compensation in those jurisdictions is less linked to short-term profits and more linked to risks, with CEOs at riskier banks receiving less, by way of variable compensation, than those at less-risky peers. This was particularly true of investment banks and of banks which previously had weaker risk management, for example those that previously lacked a Chief Risk Officer.

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1 Introduction

Understanding banks' risk behavior is essential from a financial stability perspective. Banks' risk-taking incentives are shaped, among other factors, by the compensation of their top managers. Yet, top managers, and in particular CEOs, are remunerated with compensation packages that are highly complex, especially in their variable elements, and vary greatly between banks and across countries. If these packages influence top managers' appetite for risk, a sound understanding of their determinants and how these might affect banks' risk-taking incentives becomes highly important for successful regulation.

This issue has been debated at length in the aftermath of the financial crisis. Former US Treasury Secretary Tim Geithner, testifying in front of a Senate Appropriations subcommittee in June 2009, argued that "although many things caused this crisis, what happened to compensation and the incentives in creative risk-taking did contribute in some institutions to the vulnerability that we saw."

A consensus seems to exist among at least some researchers and policy-makers that, at the onset of the crisis, financial institutions took on excessive risk, notwithstanding the risk management and prudential policies that were already in place (Hellwig (2009); Admati and Hellwig (2014)). In particular, distortionary compensation practices at large financial institutions have been identified as one of the possible elements for the failure of governance in the banking industry (Fahlenbrach and Stulz (2011) or Bebchuk and Spamann (2010)).

The Financial Stability Forum (2009) set the stage for a new policy on executive compensation in the banking industry. It argued that

"[c]ompensation practices at large financial institutions are one factor among many that contributed to the financial crisis that began in 2007. High short-term profits led to generous bonus payments to employees without adequate regard to the longer-term risks they imposed on their firms. These perverse incentives amplified the excessive risk-taking that severely threatened the global financial system and left firms with fewer resources to absorb losses as risks materialized. The lack of attention to risk also contributed to the large, in some cases extreme absolute level of compensation in the industry."

Cerasi and Oliviero (2015) show, after controlling for regulatory and institutional factors, that a combination of lax regulation and greater variable pay for CEOs (namely stock options and/or bonus related to performance) was associated with an inferior financial performance at some banks during the 2007-08 financial crisis. This accords with more recent evidence on the relevance of several other aspects of corporate governance for explaining the ex-post performance of banks (Laeven and Levine (2009); Beltratti and Stulz (2012); Ellul and Yerramilli (2013)).[1] Yet, in spite of this evidence, we still lack a good understanding of time-related and cross-country heterogeneity in banks' CEO compensation schemes.

How can we explain the differences we observe in the way banks reward their CEOs? Given that bank CEOs are held accountable for their incentive to seek tail risks, has the structure of

[1] A different view is provided by Cheng *et al.* (2015)), who claim that higher CEO compensation before the crisis merely reflected the greater risk involved in their function and did not cause greater risk, suggesting a reverse causality.

CEO compensation changed since the financial crisis? Has bank regulation affected the way CEOs are paid? These are the questions we try to address in this paper.

We analyze the structure of CEO compensation within a sample of international banks from 2006 to 2014. To perform our analysis, we use a detailed database from S&P Capital IQ that reports the different elements of banks' CEO compensation, which we integrate with information on bank balance sheet data and information on the macroeconomic and institutional setting. In particular, we study how CEO compensation has responded to measures of profitability and risk over the years. Finally, we use the recent changes in the regulation of bankers' pay to control for the presence of a structural break.

Specifically, we exploit a recent regulatory change, namely the introduction of the Financial Stability Board's (FSB) Principles for Sound Compensation Practices and their Implementation Standards (Principles and Standards, P&S) in 2011, to analyze variations in CEO compensation. The new regulation was developed to align compensation with prudent risk-taking, particularly at systemically relevant financial institutions. The P&S require compensation practices in the financial industry to align all employees' incentives with the long-term profitability of the firm. Moreover, the P&S call for effective governance of compensation, and for compensation to be adjusted for all types of risk, to be symmetrical with risk outcomes, and to be sensitive to the time horizon of risks. As the P&S are intended to apply to all significant financial institutions headquartered in FSB and EU jurisdictions (through the adoption of the CRD IV), we can consider these banks as the "affected" (or "treated") group and compare their behavior with financial intermediaries in other jurisdictions that are "unaffected" ("not treated"), i.e., the "control group". The P&S policy was transposed into national regulation in 2011 for all banks within FSB jurisdictions and EU countries included in our sample; this allows us to neatly test the differing effects in affected and unaffected banks.

First, we find that the affected banks have changed CEO compensation policies more than the banks in the control group have. Second, the analysis shows that the affected banks have made the variable elements of CEO compensation less responsive to measures of short-term performance, while more negatively correlated to measures of risk. Third, we find that CEO compensation in investment banks has became much more sensitive to risk measures than in the case at commercial banks. Finally, our analysis indicates that the policy had a greater impact on banks where risk management governance was weaker (i.e. at those that lacked a chief risk officer (CRO) before the implementation of the policy), in line with the results in Ellul and Yerramilli (2013).

Our paper is not the first one to empirically analyze the relationship between bank CEO compensation and risk-taking after the financial crisis. Many papers have already used information from the US and other advanced economies to study the evolution of the different elements of CEO compensation (see, for example, Gregg *et al.* (2012); Cheng *et al.* (2015); DeYoung *et al.* (2013); Bhagat and Bolton (2014)).

Other papers have also focused on the relationship between CEO compensation and risk, such as Fahlenbrach and Stulz (2011), Gregg *et al.* (2012), Chesney *et al.* (2012) and Cheng *et al.* (2015); these papers are centered mainly on the financial crisis in the US and UK.

A few papers also control for country heterogeneity and regulation, exploiting information on international banks, such as Huttenbrinka *et al.* (2014) and Cerasi and Oliviero (2015). Finally, there are several papers showing the importance of corporate governance for bank risk, such as Laeven and Levine (2009), Gropp and Kohler (2010); Beltratti and Stulz (2012), and Ellul and Yerramilli (2013); however CEO compensation is not part of their analysis, with the exception of that of Ellul and Yerramilli (2013) where the CRO's importance in the hierarchy is the principal focus.

The novelty of our paper is to explore in more detail the variable part of CEO compensation in relation to the institutional and macro-economic characteristics of the country in which the bank is headquartered comparing the pre- and post-crisis period. Our paper uses the introduction of the P&S as an experimental setting to design a specific test for such a change in behavior.

A few papers have previously analyzed how the introduction of the regulation has affected CEO compensation (Ferrarini and Ungureanu (2011) or the review in Murphy (2013)). However, these papers focus mainly on one specific aspect of the new regulation, namely the introduction of a bonus cap, without exploiting the cross-country heterogeneity in the regulation's application. The only paper, to our knowledge, to have conducted an empirical analysis of the new regulation is Kleymenova and Tuna (2016): through an event studies approach, they study how financial markets responded to the news of the introduction of a bonus cap on executive compensation in the UK and in the EU.

They show that the impact of the new UK regulation was larger than that of the subsequent bonus cap in the EU, which may have reflected the un-anticipated feature of the second policy measure. Our paper complements this analysis by exploiting the cross-sectional information between the jurisdictions that did and those that did not apply the P&S policy.

The remainder of the paper is organized as follows. The next section describes the data and the evolution of bank CEO compensation prior and after the financial crisis. Section 3 discusses the changes in the regulation of bankers' pay and the evolution of CEO variable compensation. Section 4 presents our empirical analysis of the impact of the P&S policy, while Section 5 is devoted to several robustness checks. The last section summarizes the main conclusions of the paper.

2 Evolution of CEO compensation over time

In this section we study the evolution of CEO variable compensation in banks after the financial crisis. Information on CEO compensation was sourced from S&P Capital IQ - People Intelligence and Capital Structure - between 2006 and 2014 for 173 banks located in 36 countries. In particular, we selected the ten largest financial institutions (among the commercial, savings and investment banks) in each country for which we found information on CEO compensation.[2] Our sample is therefore limited by the actual number of banks disclosing

[2]From the list of banks in our sample in the Appendix one can see that for some countries the number of banks is larger or smaller than ten. This depends on the effects of banking industry reorganization. For example, in the

this information. Disclosure on executive compensation is quite common among the largest and listed banks, although not everywhere mandatory; this explains why this information is not available for all the largest banks. We have also collected accounting records and weekly stock returns at individual bank level (only for listed banks). At a more detailed level, we can identify the CEO at any time for each specific bank together with their compensation. The remuneration of CEOs combines several elements (fixed salary, cash bonus, equity shares and stock option awards, long term benefits, etc.). Total annual compensation of a bank CEO is the sum of all cash and non-cash rewards in a specific year t (including equity shares and stock options awarded in year t): it does not include stock options awarded in year $(t-1)$ or before, even when liquidated in year t. Since the variable part of CEO compensation can be very complex and differs considerably between CEOs, we choose to focus on this component as our main variable of interest. The variable part of total compensation is computed by subtracting the fixed salary from the total annual compensation.

2.1 Descriptive statistics

Table 1 reports descriptive statistics of our sample, both for the main bank characteristics and their CEO's compensation. In particular, the first part of the table reports the composition of our sample according to bank models (investment vs. commercial banks) and geographic area (North America and Australia; Asia and Africa and Europe). Interestingly, European banks account for 44 percent of the sample, while 21 percent are North American and Australian banks and around 36 percent are Asian banks, with only few banks from two African countries. In our sample, 19 percent of the banks are investment banks. All banks are listed on the stock market. The average bank in the sample has $1.5 billion in total assets and a Tier 1 ratio of 11.8 percent.

CEO compensation statistics are detailed in the second part of the table. Annual total compensation per individual bank CEO is on average $3.8 million, while the fixed salary is around $1 million. Variable compensation represents on average 51 percent of a CEO's total compensation. About 37 percent of variable compensation is given by short-term cash rewards, while around 63 percent is via non-cash compensation (e.g., stock options, restricted stock awards, equity shares, etc.). Banks that award stock options to their CEOs account for 37 percent of our sample.

In Table 2, we report the descriptive statistics for a selected number of variables by dividing the sample into two sub-periods: pre- and post-financial crisis. We excluded 2008, the year of the Lehman Brothers' default at the start of the financial crisis. We observe a deterioration in all measures of banks' performance, return on equity (ROE) and return on assets (ROA), and both measures of risk, non-performing loans (NPL) and stock return volatility (SRV) have all increased since the financial crisis. Total compensation since the financial crisis has fallen on average by $2 million per CEO; the variable part of CEO compensation has been squeezed

case of Poland, the top banks changed over the years and we had to include additional ones; elsewhere, fewer than ten banks were observed, as in the case of Italy, because of mergers and acquisitions and a lack of information on CEO's remuneration at the smaller banks.

from 59 to 49 percent: this is due to a reduction in both cash variable compensation and stock awards. It is interesting to note that the fixed part of CEO compensation, the salary, has also fallen, from $1.23 million to $1.11 million on average, i.e., by $120,000 since the financial crisis.

In Figure 1, we plot the evolution of CEOs' compensation levels and composition, distinguishing between commercial and investment banks. Total compensation dropped from an average of $6 million in 2007 to $3 million in 2008 because of the global financial crisis. This drop has been more pronounced for investment banks than for commercial banks. The composition of the compensation, as captured by the share of variable over total compensation, follows a similar pattern as we can see in the second panel of Figure 1. In particular, it falls from about 60 percent in 2007 to 45 percent in the post-crisis years for commercial banks. For investment banks the drop is larger, although rising again in the recent years. As a matter of fact, commercial and investment banks have different business models and different incentive structures for management. The difference is evident prior to the crisis, although total compensation is more homogeneous afterwards. It would be interesting to ascertain if a different catch-up process was in place after the introduction of the post-crisis regulatory changes. This could at least in part explain the convergence process for total compensation, although the composition differs between bank business models.

Figure 2 shows the composition of CEOs' compensation, distinguishing between banks headquartered in countries differently hit by the global financial crisis.[3]. The first panel shows a larger drop in variable compensation for banks in countries hit by a banking crisis. Moreover, CEOs in the banks exposed to a banking crisis started with a greater share of variable compensation in 2006-07 but ended up with a smaller share in the period 2010-14. In the second panel we focus on the varying behavior of European countries affected by the sovereign debt crisis. The variable compensation at European banks in countries with a sovereign debt crisis between 2010 and 2011 (the so-called PIIGS: Portugal, Ireland, Italy, Greece, Spain) fell both after the Lehman default and during the sovereign debt crisis. Variable compensation dropped following reduced profitability.

In Figure 3, we plot banks' performance, profitability (measured as ROE) and risk (measured as standard deviation of weekly stock prices), distinguishing the two different bank business models. In the first panel, we see that investment banks' profits are more volatile than those of commercial banks and that this is also reflected in a higher level of risk in the second panel. Profits for commercial banks during the global financial crisis were more stable, probably due to their greater degree of revenue diversification. During the financial crisis, risk increased for both investment and commercial banks, declining after the crisis for both types of bank.

The graphical analysis is suggestive of changes in the economic conditions that may have affected the variable part of CEO compensation. Clearly, after the crisis, banks have performed worse and this explains why their CEOs received a lower share of variable compensation, which is typically tied to performance. Also the volatility in performance may have affected the

[3]The definition of a country that has been affected by the global financial crisis is taken from Laeven and Valencia (2012)

variable compensation for CEOs. However, the crisis has obliged countries to adopt changes in their prudential policy, and this may have affected CEO compensation.

It would be interesting to ask whether the response with respect to short-term profitability and risk has changed in response to country-specific shocks or to regulatory changes. In any case, we need to control for these factors and we will devote particular attention to check the robustness of our results with respect to specific country characteristics.

3 The change in regulation of bankers' pay

After the 2007-08 financial crisis, the Financial Stability Forum and its successor, the Financial Stability Board (FSB) were mandated by various stakeholders, including central banks, treasury ministers, and stock market gatekeepers, to provide new guidelines for executive compensation at banks. The FSB's "Principles and Standards of Sound Compensation" (P&S) mainly concern the design of executive compensation, and in general the remuneration of all Material Risk Takers (MRTs) in banks, including CEOs. Furthermore, the FSB called for executive compensation to be increasingly tied to the risks assumed in the banking core business. This is achieved, on the one hand, by designing the variable part of the compensation of executives in relation to (ex-ante) risk measures; and, on the other hand, by introducing some form of deferrals in the compensation, through claw-back clauses, to ensure there is enough time to observe the actual achievement of (ex-post) lower tail risk. After the publication of the Principles, the Standards were implemented in 2011.

3.1 Principles of Sound Compensation (P&S)

This section discusses the content of the nine Principles that are at the heart of the P&S policy and their implications. The Principles explicitly underline the relationship between managerial compensation and risk appetite within the bank organization (see Financial Stability Forum (2009)). Before the financial crisis, this relationship was not well recognized. While managerial compensation was set with the aim of motivating or retaining hard-working and talented managers, the risk appetite of the bank was monitored by the risk management committee, which had no say on managerial compensation.

After the crisis it was clear that the structure of managerial compensation indeed affected the risk appetite of the bank. Rewarding managers with equity grants, for instance, increased their focus on short-term objectives, while it reduced their incentive to achieve outcomes in the lower tail of the performance distribution.

The nine Principles are divided under three main headings: corporate governance (Principle P1 to P3), compensation (Principle P4 to P7) and supervision (Principle P8 to P9).

Corporate governance. These three principles discipline the way banks must set the managerial compensation. Although the FSB clearly states that there is no single system of compensation (i.e. that "one size does not fit all"), the chosen system must still comply with the features listed below.

- P1: Independence of the compensation system. Insiders (CEO and management team) must be restricted from influencing their own remuneration.
- P2: Accountability of compensation system. Performance and risk measures must be observable and easy to evaluate, so that achievements to which compensation is related can be easily assessed by all parties.
- P3: Integrity of risk measures. Risk managers must be independent, and avoid setting risk targets in the interests of insiders and allowing them to game their compensation.

Compensation. These four principles, which are more relevant for our analysis, state the main rules to follow when setting the structure of managerial compensation.

- P4: Heterogeneity of managerial compensations. Within the same organization, each MRT must be compensated according to his own marginal contribution to bank risk.
- P5: Symmetry in the elasticity of compensation to risk outcomes. Compensation must vary in a symmetrical way, either up or down, conditional on performance and risk outcomes.
- P6: Deferrals. Compensation must take into account the length of the time required for risk to materialize and allow for the compensation to vary as a function of a specific risk outcome.
- P7: Optimal mix of cash and equity. Stock options, equity grants and cash bonuses should be set in an optimal combination in order to moderate excessive risk-taking.

The document states clearly that each bank must be able to freely decide its optimal compensation structure, provided that the chosen structure complies with these principles. Each bank must find its own way to apply sound compensation practices. Some banks may prefer to rely on quantitative measures, while others on discretion when relating the performance of their own employees to the share of risk undertaken.

Supervision. These two principles define the tasks of supervisors and disclosure of information outside and inside the bank.

- P8: Supervisors must ensure implementation of compensation principles. National supervisors must monitor the application of compensation practices either at bank level within the same country and among countries to ensure an even application of the principles to avoid regulatory arbitrage.
- P9: Disclosure of compensation. Enough disclosure must be assured at the bank level both for the interests of all stake-holders and for the supervisors' needs.

The P&S are not international standards that, once implemented in domestic jurisdictions, become supervisory or regulatory norms to which each bank must comply. The question therefore arises as to how to ensure that the Principles will be adopted by all the banks that

authorities consider significant for this purpose. Each national supervisor is responsible for the implementation of the relevant national regulation or supervisory guidance, whereas the FSB has identified compensation as one of the priority areas for implementation monitoring, with a dedicated monitoring framework to review and support implementation by all member jurisdictions. At the national level, there are different degrees of intervention in case a bank fails to comply. The national supervisor i) can exercise moral suasion to convince the bank to comply; then it can escalate using ii) firmer interventions within the range of supervisory actions that are applied, including, where available, increasing the bank's specific prudential requirements, such as capital requirements. At the supranational level, coordination among supervisors has the objective to prevent regulatory arbitrage by multi-national institutions.

To understand whether and how quickly the principles have been translated into national laws, we computed an index of the intensity of regulation. Figure 4 shows that the full set of P&S were immediately implemented in the countries belonging to the FSB in our data sample (solid line), while for other countries not represented in our sample the implementation was a bit slower (dashed line). The behavior of the index displays a step-wise convergence of regulatory intensity from 2011 to the final year in our sample.

3.2 Testable implications

Following the discussion of the principles, we provide here the list of the hypothesis to be tested.

First, the set of principles from P4 to P8 has the purpose of changing the structure of CEO compensation in banks.

- **Hypothesis 1**: *Has the percentage of the variable over total compensation of CEOs changed as a consequence of the implementation of the P&S?*

  The aim of the new regulation is to influence CEO compensation with a view to dampening banks' risk incentives. As a first step, we aim to see whether there has been a change in the structure of CEO compensation. The complex structure of CEOs' remuneration can be more easily captured by looking at the share of variable compensation. If the norms contained in the P&S have been applied, we should detect a change (reduction) in the balance of variable and total compensation.

- **Hypothesis 2**: *Do we observe heterogeneity in the impact of the P&S on our sample of banks?*

  The regulator states that "one size does not fit all", as banks are free to find their optimal compensation structure in line with the norms in the P&S. Hence we expect to observe a heterogeneous impact of the principles across banks in our sample. In general we control for unobservable (to the econometrician) characteristics of the individual banks that could alter the response to the implementation of the P&S by adding bank fixed effects. However, it could be that banks with different business models or corporate

governance quality, responded differently to the application of the principles. First of all, we control for the bank business model to see whether commercial or investment banks have made greater changes to their compensation policy after the implementation of the P&S. Investment banks tend to pay their CEOs with a greater share of variable compensation in order to attract the most talented individuals. However, given their core business and the lighter regulatory framework in which they operate, their performance is more volatile. Then, if the main goal of the P&S policy is to mitigate risk incentives, we expect CEOs' compensation in investment banks to be more affected by the introduction of this policy compared to commercial banks.

As for the quality of the corporate governance that matters for risk incentives, following the results in Ellul and Yerramilli (2013), we control for the importance of the risk management function within the bank hierarchy. If the risk officer sits on the board, this signals the importance attached by the bank's shareholders to risk management. So we control for the presence of a chief risk officer (CRO) before the introduction of the P&S policy, to distinguish between banks that were at the time relatively more aware of the importance of the risk management and those with weaker governance on this respect. We expect the policy to be less effective, other things being equal, for banks with a higher governance quality: this would imply that banks with a stronger risk management were those less in need of reforming their compensation structure.

- **Hypothesis 3**: *Has the sensitivity of the variable compensation with respect to short-term performance changed after the implementation of the P&S policy?*

  Principle P5 requires CEO compensation to become more responsive to bad outcomes, i.e. it should be reduced whenever measures of performance fall. In the meantime, P6 requires compensation to respond only after the observation of the performance outcome. This means that we should control whether the response of the variable part of the compensation, by definition more sensitive to short-term performance, has diminished after the implementation of the principles.

- **Hypothesis 4**: *Has the sensitivity of the variable compensation with respect to risk measures increased after the P&S?*

  Principle P6 requires executives to be penalized after bad outcomes occur, by extending the time elapsed between their actions and their monetary reward, so that there is enough time to observe the outcome of the risks undertaken. For the P&S to bite on risk-taking incentives, we must be able to observe a change in the response of variable compensation to measures of risk.

- **Hypothesis 5**: *Do we observe a greater CEOs' turnover after the P&S?*

  The introduction of the principles may have also contributed to changes in the composition of the board and in the executive leadership. If this is the case, we expect to see a rise in CEO turnover after the implementation of the P&S once we control for other factors that may explain CEO turnover.

4 Impact of the policy

In order to control for the effect of the P&S policy on the structure of CEOs' variable compensation, we adopt an approach that compares affected ("treated") with unaffected ("not treated") banks.

To this end we drew up a list of affected banks from two sources: (i) those headquartered in the countries[4] affiliated to the FSB and (ii) those operating in EU countries (within the CRD IV these countries have adopted a mandatory amendment with the P&S guidelines). Both groups (i) and (ii) were under the scrutiny of national bank supervisors that exerted moral suasion to adopt the new principles soon after implementation. Given the national and international supervisory pressure on the affected banks, these have changed their executive remuneration policy in 2011. As shown in the previous section, by referring to the behavior of the regulatory index, this policy became effective in 2011 for all the banks included in our sample. It is worth stressing that all the banks in EU countries adopted the P&S through the implementation of the CRD IV.[5] Hence, we include among the affected banks all the financial institutions headquartered in EU countries, even if they did not belong to an FSB country. As a result, the percentage of affected banks in our sample is 74 percent, and about 22 percent of the affected are investment banks. The policy came into effect in 2011, while the CRD IV took effect only in January 2014: we still consider 2011 as the beginning of the treatment under the presumption that the implementation of regulation was de facto anticipated as anecdotal evidence suggests. As a robustness check, however, we will allow for a different initial treatment year for banks located in EU countries.

4.1 Is there a structural change in the variable over total compensation of CEOs as a consequence of the implementation of the P&S?

We start by comparing the structure of executive compensation of the affected banks with the banks in the control group. Following *Hypothesis 1*, we expect to observe a drop in variable over total compensation for those countries that adapted the P&S in 2011. In Figure 5 we plot the average share of variable compensation for four subsamples of banks, combining the group of affected banks and unaffected and the financial institutions classified as investment banks vs. commercial banks. The average is computed for three years 2006, 2010 and 2014. It is quite evident that the affected banks have reduced the compensation to their CEOs after the year 2010, while this has not occurred in the control group, either commercial and investment banks.

[4] Notice that the P&S policy is applied at country level except for Australia where the investment banks are outside the scope of application of the policy: we therefore exclude them from the affected banks.

[5] In addition to the other principles within the P&S, the EU countries have imposed a cap on the amount of variable over total compensation at 50 percent; this cap can be augmented only with the approval of a qualified majority of shareholders.

4.2 Are affected banks different? Test for sorting bias

This preliminary evidence is suggestive of a role played by the policy in affecting CEOs' compensation. But this evidence may simply reflect a sorting bias. It could be that either the affected banks, or their CEOs, have some special characteristics that explain the behavior of the response of the share of variable compensation to bank performance and risk, although independently of the introduction of the P&S. For instance, affected banks may be more risk-averse and therefore tend to design flatter managerial compensation schemes for their CEOs. To shed some light on the importance of this possible bias, we perform a dynamic test for sorting, similar to that in Foà *et al.* (2015), for the selection of banks in the P&S policy. Specifically, we collect information on the age and the gender of the CEO, both factors which might influence risk-taking. Moreover, we control for bank-specific characteristics before the adoption of the policy, such as measures of profitability (ROE and ROA), as well as measures of risk, diversification and leverage ratios. The dependent variable is the treatment dummy, which takes value 1 if a bank is affected and 0 otherwise. The sample is limited to observations up to 2011, i.e. before the implementation of the P&S policy took place.

The estimation procedure consists in a logit model, here applied to different specifications, as displayed in Table 3. Regardless of whether CEO- or bank-specific characteristics are considered separately or jointly, none of the variables has a significant impact on the probability that an intermediary is considered part of the group of treated banks. These results seem to rule out the presence of sorting for the banks in the treatment policy.

4.3 Change in response of CEOs' compensation over time

As a first step to verify our testable implications (*Hypothesis 1, 3 and 4*), we examine how the correlations of CEO compensation with respect to measures of bank performance and risk have changed over time. In each year we measure the difference in response of CEO compensation to performance and risk compared to 2011, i.e. the year of the treatment. To this aim we divide our sample around 2011 as the benchmark year and estimate the following equation:

$$Y_{it} = \alpha_i + \lambda_t + \sum_{\tau=2006}^{2010} \gamma_\tau W_{it} \mathbf{1}(t=\tau) + \sum_{\tau=2012}^{2014} \gamma_\tau W_{it} \mathbf{1}(t=\tau) + \epsilon_{it} \tag{1}$$

where Y_{it} indicates the share of variable compensation in period t of bank i. The time-varying coefficients γ_t measure the difference in the effect of a specific explanatory variable in W_{it} on the dependent variable Y_{it} at time τ relatively to the benchmark year 2011. Furthermore, we add bank time-invariant fixed effects (α_i) and time fixed effects (λ_t) to absorb all common variation due to time, shared by all banks.

The vector W_{it} contains the return on equity (ROE_t), its lagged value (ROE_{t-1}) and contemporaneous stock return volatility (SRV_t).[6] We prefer to measure profitability with ROE

[6]The lagged value of SRV is never significant and has been excluded from the analysis. Notice that using SRV as measure of risk affects our sample size, which is now restricted by the actual number of listed banks.

rather than ROA, because the latter measure tends to overestimate bank profitability for banks that have a large portion of non-interest sources of income (trading income, fees and commissions for services) as these revenues are not reflected in (and therefore cannot be scaled by) total assets. However, as a robustness check not reported here, we have performed the analysis with ROA and the percentage of non-performing on total loans (NPL) as alternative measures of profitability and risk: in both cases we obtain similar results.

In Figure 6, we plot the estimated coefficients at each point in time (the reference year is normalized to zero). In other words, each bullet represents the sum of the coefficients τ_t attached to the dependent variable W_{it}, summing up the contemporaneous and, where available, the lagged value, in a specific year τ. The aim is to illustrate the changes in correlation between compensation and measures of performance and risk in order to detect the presence of a possible structural shock.

First of all, comparing the behavior of treated banks with the control group (not-treated banks), we see that prior to 2011 the trends are similar both in terms of ROE and SRV. After 2011 the trends between the two groups tend to diverge. This provides some preliminary evidence that the treatment had some effect (*Hypothesis 1*): as a matter of fact those two groups before the treatment don't show a statistically different behavior. We can notice that actually before 2011 the coefficients for SRV were indeed increasing for the treated banks and switched to a decreasing trend after 2011, while the control group does not show this feature. This is preliminary evidence that the treatment policy has been effective.

After 2011 the sum of the coefficients for the contemporaneous and lagged measure of ROE tend to lie below the zero line and the correlations are estimated with greater precision (the smaller brackets indicate smaller standard errors) compared to previous years: this means that the share of variable compensation responds less to short-term performance after 2011 for the treated banks (*Hypothesis 3*). At the same time, the coefficients for risk have a larger (negative) impact on the share of variable compensation after 2011, but only for treated banks (*Hypothesis 4*): this implies that the greater the risk, measured by SRV, the smaller the variable compensation to CEOs. This is not true for the control group. These results indicate that changes in the regulation occurred in 2011, could have determined a change in the way bankers' compensations are designed.

Although this analysis is suggestive of some changes occurred in the structure of CEO compensation, it could be confounded with the fall in measures of performance to which the variable part of the compensation is tied. As alternative explanation, it could be that the change in regulation have had an impact on the way banks pay their CEOs. To disentangle macroeconomic factors from the regulatory ones, we study how the share of variable compensation is affected by changes in performance and risk within an econometric analysis to control for all confounding factors, such as bank and country characteristics.

4.4 Effect of the P&S policy on CEO compensation: A diff-in-diff approach

In this section, we test for changes in the impact of profitability and risk on the share of variable compensation before and after the introduction of the P&S controlling for changes

in common and bank idiosyncratic factors. For each bank i and year t, we run the following regression:

$$Y_{it} = \alpha_i + \lambda_t + \beta X_{it} + \gamma_s W_{it} + \sum_{h=1}^{H} \delta_h D_h + \sum_{h=1}^{H} \phi_h \left(D_h * W_{it}\right) + \varepsilon_{it} \tag{2}$$

where the dependent variable Y_{it} is the share of variable compensation for bank i at time t, X_{it} is a vector of bank or country explanatory variables, W_{it} includes measures of profitability and risk. Similarly to the previous regression analysis, the vector W_{it} contains the return on equity (ROE_t), its lagged value (ROE_{t-1}) and the contemporaneous stock return volatility (SRV_t). D_h denotes a vector $[d_1, d_2, ..., d_h]$ containing dummy variables, while $D_h * W_{it}$ represents interactions among dummies and continuous variables. Finally, α_i and λ_t denote bank and time fixed effects, respectively. Among the dummy variables we include:

- "Post" which takes value 1 if year > 2011 to capture the change in regulation;
- "Inv", which takes value 1 when the bank is an investment bank;
- "Treated" which takes value 1 if the bank is under the scope of application of the P&S policy or headquartered in one of the EU countries.

Table 4 reports the results of the baseline regression. The profitability measure includes the contemporaneous and the one-period lagged value to account for profitability in the short run. The estimated coefficients of the lagged and current explanatory variable are summed up for the sake of brevity (with the associated standard errors being provided in parentheses). We measure bank profitability by its return on equity (ROE) or return on assets (ROA). We consider both measures in a simplified model (Specifications (1) and (3) and with interactions of the main variables with a specific dummy for investment banks in Specifications (2) and (4)). Investment banks have a different business model and, as indicated also in the descriptive statistics in Section 3, CEO compensation structure could be different. For both profitability measures, the main results are the following: We observe a positive correlation between the share of variable compensation and bank profitability before 2011, as indicated by the coefficient of Profit. In the case of ROE, this correlation significantly decreased for all banks after the introduction of the policy (as shown by the difference in the coefficients of Profit and Post×Profit). These results provide evidence that the P&S has changed the way CEOs are compensated (*Hypothesis 1*) and they are in line with our expectations both in terms of the response to short-term performance (*Hypothesis 3*) and on measures of risk (*Hypothesis 4*).

When we control for the bank's business model (*Hypothesis 2*), CEO's variable components are even more responsive before 2011 for commercial banks (0.628^{***}). For investment banks, on the other hand, the coefficient is substantially smaller (as shown by the difference in coefficients between Profit and Inv×Profit, i.e. $0.628 - 0.517 = 0.111$ in Specification (2) and $4.999 - 4.884 = 0.115$ in Specification (4)). Moreover, while we still observe a significant reduction after 2011 for commercial banks, variable compensation in the case of investment banks did not change its response to short-term profits. By contrast, the impact of risk on CEOs'

variable compensation is fairly stable across the different specifications. Disregarding banks' business models, we observe a negative impact of risk before 2011, given by the coefficient of Risk. This negative coefficient increases significantly after the change in regulation. For investment banks, in particular, the (negative) sensitivity intensifies substantially (-4.22 in Specification (2) and -3.03 in Specification (4)).

Interestingly, if a new CEO is appointed (CEOentry), the share of variable compensation is lower on average. This can be explained by the fact that for a new CEO the bank does not have past performance indicators related to his actions in order to award a bonus.[7]

Among the macroeconomic controls we test for GDP growth of the country where the bank is located and we find that it has no significant impact on the share of variable compensation.

Table 5 shows the estimation results of the complete version of equation (2), in which we added the dummy for treatment and its interactions with the bank-specific variables. As before, the coefficients are computed as the sum of the current and lagged coefficient values (with associated standard errors in brackets). We report the results for the benchmark regression using ROE as the profitability measure in the first column, while ROA in the second column. The regression with the treatment shows a better fit to the data (higher within R^2).

The individual effects for commercial and investment banks, as well as a weighted average (all), are reported in Tables 6 and 7 showing the aggregate effects for treated and not-treated banks before and after the implementation of the P&S policy. The difference between pre- and post-treatment, namely the impact of the treatment, is provided in column (Δ). As can be seen from Tables 6 and 7, there is a significant decline in the response of variable compensation vis-à-vis a bank's short-term profitability for the whole sample of banks (*Hypothesis 3*). However, a more detailed analysis reveals differences across business models. Specifically, we find a significant decline for both treated (-0.297^{**}) and not-treated (-0.806^{*}) commercial banks. The latter is statistically marginally significant and might be explained by spillover effects among banks. In other words, regulation that draws on the corporate governance of a set of banks, here the treated banks, also affects other banks operating in the same business as an "implied obligation". On the contrary, no significant change can be observed for all investment banks.

As we suggested in the previous section, CEOs' variable compensation is also related to bank market risk, here measured as banks' stock return volatility, calculated on a weekly base from stock prices. As Table 4 shows, ignoring the treatment status, higher market risk leads on average to a lower share of variable compensation. After the implementation of the P&S policy, we observe a significant increase in the (negative) correlation of CEO variable compensation for all treated banks regardless of their business model (*Hypothesis 4*). The effect is particularly significant for investment banks. Contrary to the case of profitability, we do not observe spillovers on the elasticity to risk from treated to not-treated banks: as a matter of fact the change in the elasticity of the share of variable compensation with respect to market risk is

[7]Notice that the variable compensation may in principle also increase when there is a change in CEO. One the one hand, incoming CEOs may be given a "golden handshake" when taking their new job (since they may have foregone bonuses at their old bank); on the other hand, outgoing CEOs pocket the "golden parachute" even when they have contributed to the increased outcome of risks in the bank they are leaving.

not statistically significant for the control group.

4.5 The role of the risk management function

The regulator has taken a "one size does not fit all" approach. Hence we must control for bank-specific characteristics that might explain the different impact of the policy such as the quality of corporate governance (*Hypothesis 2*).

In particular, we can control for the importance of the risk management function in the governance of the bank. We replicate the results of the previous analysis by replacing the dummy for the business model with a dummy indicating the presence of the CRO (Chief Risk Officer). The results in Tables 8, 9 and 10 indicate that our main results on the response of the variable compensation to changes in short-term profitability are driven by the group of banks that do not have a CRO in the board. Specifically, we find no significant impact of short-term profitability on CEOs' variable compensation for banks where a CRO is present. For banks without a CRO, on the other hand, we detect a significant positive influence of profitability on CEOs' variable compensation before the P&S were implemented, which drops significantly and becomes insignificant afterwards. For treated banks with (without) a CRO, the effect of risk on CEOs' variable compensation is negative (positive) before the regulation took place. In both cases, the response decreased significantly in the subsequent period. For not-treated banks without a CRO, variable compensation heavily depends on bank risk before the P&S came into force. This effect becomes insignificant in the subsequent period. For not-treated banks with a CRO, on the other hand, no significant effect from risk is detected, regardless of the time period. The results indicate that the P&S policy has been more effective in changing the compensation structure for the banks that have a weaker internal risk governance. This is in line with Ellul and Yerramilli (2013).

Another question of interest concerns the change of the banks' CEO after the P&S were implemented (*Hypothesis 5*). Table 11 reports the results of a logit model with the appointment of a new CEO as the binary dependent variable taking the value of 1 if a new CEO enters the bank in year t and 0 otherwise. Interestingly, the likelihood of a CEO change decreased after the implementation of the P&S, whether bank fixed effects are included (Specification (1)) or not (Specification (4)). As soon as the treatment status as well as bank-specific characteristics and CEO compensation growth are considered (Specifications (2,3,5,6)), no significant clustering in pre and post P&S periods can be observed. The same is true for the bank- and CEO-specific variables themselves with the exception of bank size proxied by its total assets when bank fixed effects are not included.

4.6 Summary of results

Our analysis finds that the P&S policy had an impact on the share of CEOs' variable compensation (*Hypothesis 1*). In particular, the share of variable compensation is negatively correlated with risk for the treated banks (*Hypothesis 4*). Similar, but less pronounced, is the effect of banks' profitability on the variable part of compensation (*Hypothesis 3*). An interesting finding

is that the impact of the policy has been heterogeneous across banks with different business models and with different governance quality with respect to risk management (*Hypothesis 2*), lending support to the idea that the P&S are not a "one size fits all" policy. In particular, the response of variable compensation with respect to profitability has fallen for both treated and, to some extent, also for not-treated commercial banks, while we find no effect for investment banks. Instead, the response of the variable part of the compensation on risk has become significantly negative for both type of business models.

In line with the existing literature, we find that the varying governance quality across banks with respect to risk management matters for the impact of the policy. In particular, for those banks that had a CRO before the introduction of the policy, the impact of the P&S policy has been lower. Finally, we do not find the P&S policy to have any particular effect on CEO turnover (*Hypothesis 5*).

5 Robustness checks

In this section we perform several robustness checks. First, we examine if the sensitivity of the results really depends on differences in bank's business model. Second, we control for a set of concurrent events when the P&S was adopted in 2011, such as the global financial crisis or the sovereign debt crisis. Finally, we control for the clustering of other regulatory changes in those years that may have affected the structure of CEO compensation around the date of the implementation of the principles.

5.1 Ignoring bank business models

To control for the differential effect according to the business model, we take a simplified version of the benchmark model, as presented in the previous section, where we do not split the sample according to the different bank business models (commercial vs investment banks). The results displayed in Tables A.1 to A.3 replicate the benchmark regression, without the dummy for the investment banks. While we observe that our previous findings hold in this simplified version of the benchmark model, the tests are weaker (even if still significant) compared to the benchmark specification: this tells us that investment banks do indeed behave differently from commercial banks. This evidence provides support for the notion that the policy's impact differed between those two business models.

5.2 Global financial crisis and sovereign debt crisis

While the P&S policy was adopted in 2011, several other important economic events occurred almost at the same time. These concurrent factors may partly explain the changes we observe in the structure of CEOs' compensation. From an econometric point of view it could be difficult to disentangle between the effect of these factors and those of the P&S policy. However, we check the robustness of our results for at least some of these concurrent factors by exploiting the fact that these factors did not affect countries at the same way and with the same timing.

First of all, the global financial crisis that erupted in 2007-08 caused several banking crises around the world. However only a subset of countries in our sample experienced a banking crisis. We run the baseline specifications by adding the interaction between a dummy variable that indicates if the country had a banking crisis in 2007 or 2008 (the dummy is taken from Laeven and Valencia (2012)) and the dummy variable "Post" capturing the year of implementation of the P&S policy. Our main results are robust to this control, as shown by the coefficients in Tables A.4 to A.6.

Finally, as a consequence of the banking crisis, several countries had to inject public money to bail out their banks. In those countries that had already accumulated a large public debt, this caused an additional sovereign debt crisis. The countries involved were the so-called PIIGS (Portugal, Ireland, Italy, Greece, Spain). We therefore add, to the baseline specification, a dummy to control if CEO variable compensation has responded differently in these countries. Our main results are robust to this control, as shown by the coefficients in Tables A.7 to A.9.

5.3 Timing of the regulatory changes

In a final robustness check we control for a different response of CEO variable compensation for all the treated banks based in EU countries, but not belonging to FSB countries. This is to control for the difference in the timing of adoption of the policy, since the EU countries have adopted the P&S policy as part of the CRD IV in 2014, that is, later than the rest of the FSB countries. In the meantime, we add a country-specific control for the UK to capture the reform that set a cap on bankers' compensations in 2009 (see Kleymenova and Tuna (2016)). Results are robust to this control, as shown by the coefficients in Tables A.10 to A.12.

6 Conclusions

This paper studies how the structure of bank CEO compensation has changed after the introduction of the Principles and Standards of Sound Compensation Practices in 2011. To run the test, we exploit the fact that the new regulation was not applied to all banks and therefore we could split intermediaries between two groups, "affected" intermediaries and an "unaffected" control group. As CEO compensation is influenced by many factors, we constructed a detailed database sourced from S&P Capital IQ that reports information on the different elements of banks' CEO compensation and we integrated it with bank balance sheet information and other information on the macroeconomic and institutional setting.

The introduction of the P&S could have been, at least in part, anticipated by banks. Therefore, in a preliminary analysis, we have shown by means of year-by-year regressions that the behavior of affected banks and the control group were similar before 2010 and different afterwards. Another concern is that affected banks and their CEOs could have some special characteristics, independent of the introduction of the P&S, that could make them different from the control group (for example, by being more risk-averse). A specific test for dynamic sorting has dissipated this doubt, indicating that the characteristics of CEOs are similar between the two groups. We finally checked by means of an econometric model that tests for

the presence of a structural break if variable compensation, as a share of total compensation, has been less correlated with short-term profit and more correlated with risk after 2011, as regulators would intend.

We find that bankers' pay regulation had a significant impact on the structure of CEO compensation of the banks under the scope of the application of the policy. For the affected commercial banks we find that, after the introduction of the P&S, the share of variable compensation has been less (positively) correlated with short-term profit and more (negatively) correlated with bank risk. For the group of affected investment banks, on the one hand, we detect clearly the effect on risk, indicating that banks' risk-taking has been affected by the introduction of the P&S. The correlation with short-term bank profits for investment banks, on the other hand, remains similar (weak) before and after the introduction of P&S. Furthermore, within the control group, we find some "spillover effects" of the introduction of the P&S only for commercial banks and for short-term profits (even if the effect is statistically only marginally significant). In all the remaining tests, we do not detect any significant effect of the introduction of the P&S on CEO variable compensation for the control group (unaffected banks). Finally, our results are more pronounced for investment banks and for the banks without a CRO in place. This result is in line with Ellul and Yerramilli (2013) and suggests that the policy has been most effective at banks where governance of risk management was weaker.

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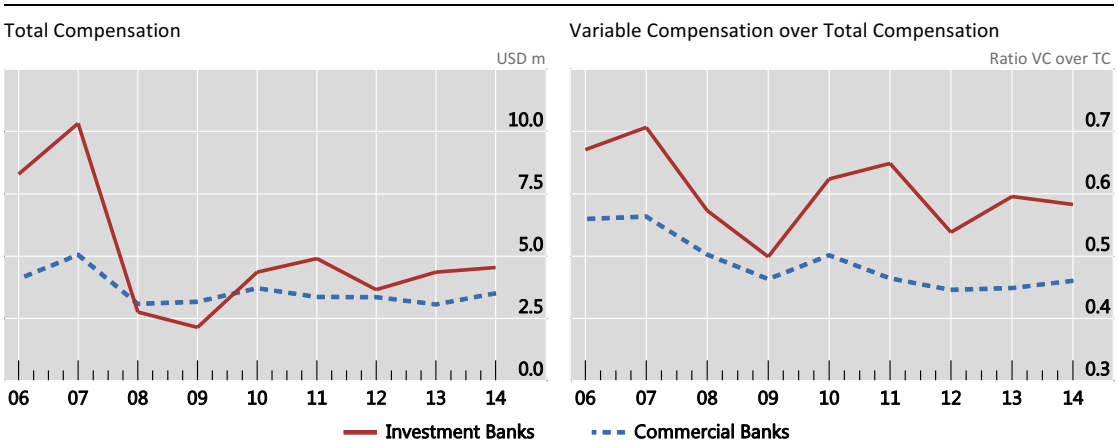
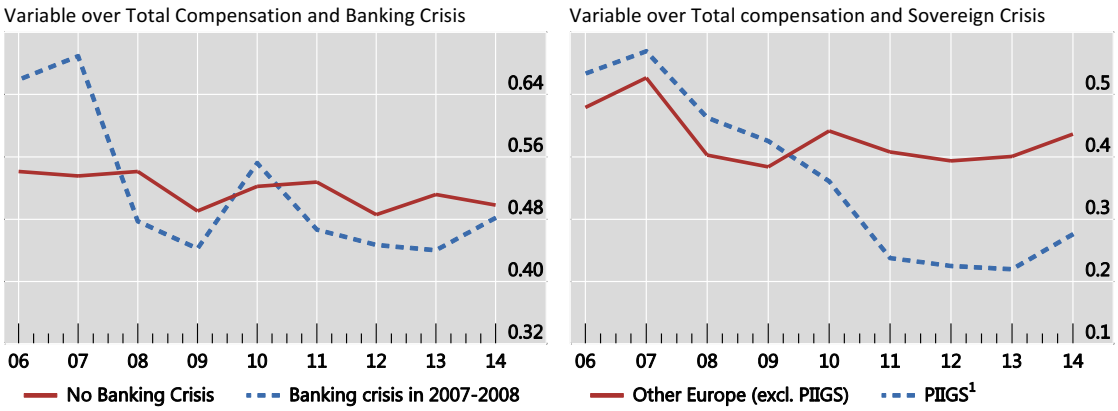
A Figures

Compensation level and composition — Figure 1



Source: S&P Capital IQ.

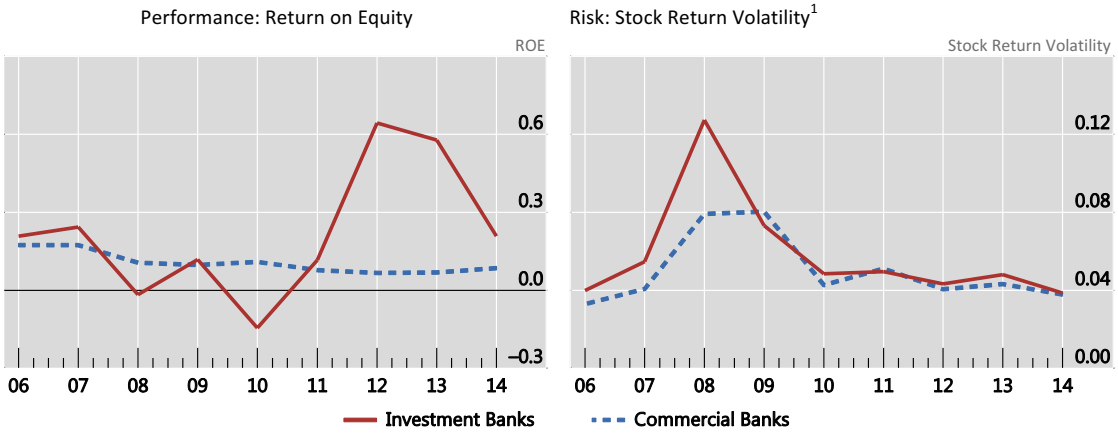
Compensation structure: differences among countries hit by the global financial crisis — Figure 2



[1] Portugal, Ireland, Italy, Greece and Spain.

Source: S&P Capital IQ.

Banks' performance: profitability and risk — Figure 3

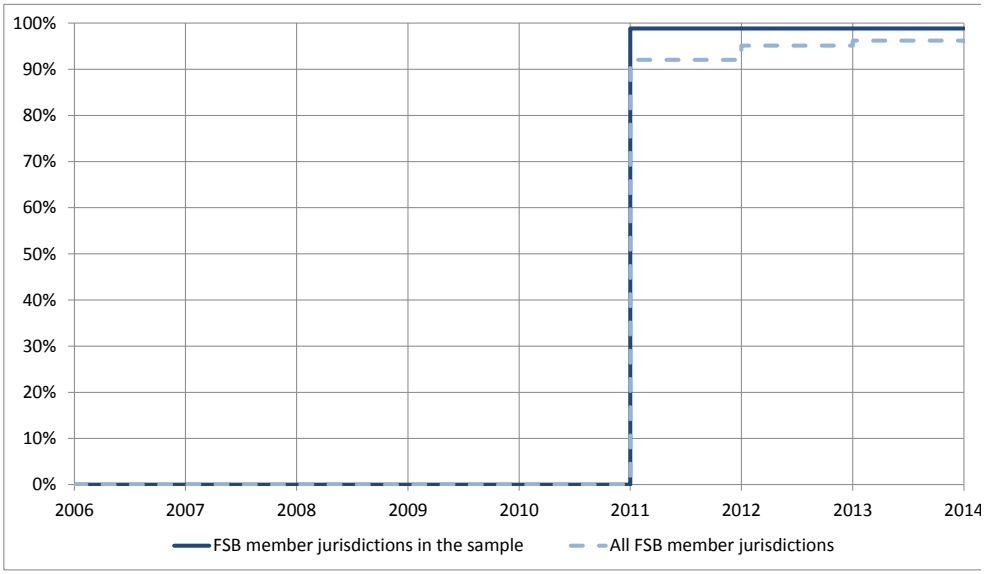


[1] One standard deviation of stock prices on a weekly basis.

Source: S&P Capital IQ.

Regulatory Intensity Index

Figure 4



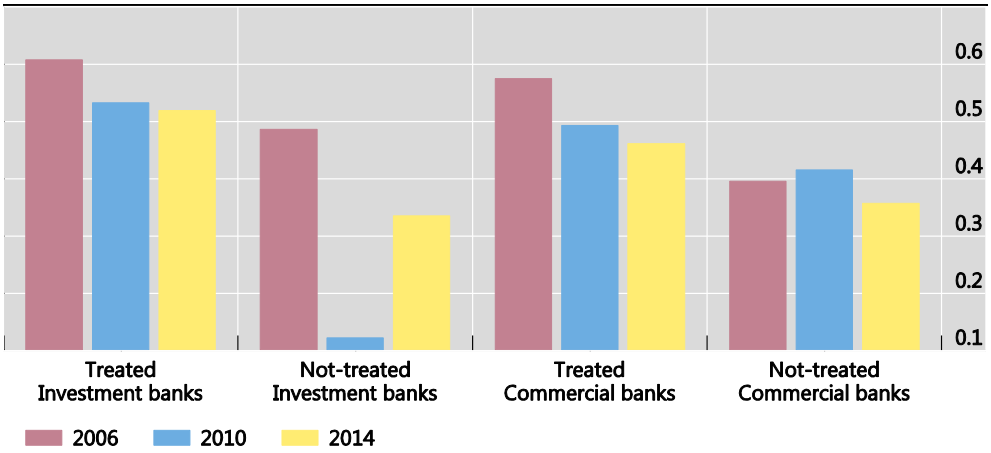
The figure shows the index for the total group of FSB member jurisdictions (dashed) and the FSB member jurisdictions in our sample (solid line). FSB member jurisdictions not in the sample are Argentina, Brazil, Indonesia, Korea, Mexico, Russia, Saudi Arabia and Turkey. If a principle or standard was translated into national law, the index takes the value of 1, otherwise it takes the value of 0. If initiatives are under consideration/preparation, the value of 0.5 was assigned to the index. The index was calculated using public information.

Source: Financial Stability Board (annual reports, several years)

Evolution of Variable Compensation Share

Ratio variable Compensation over Total Compensation

Figure 5

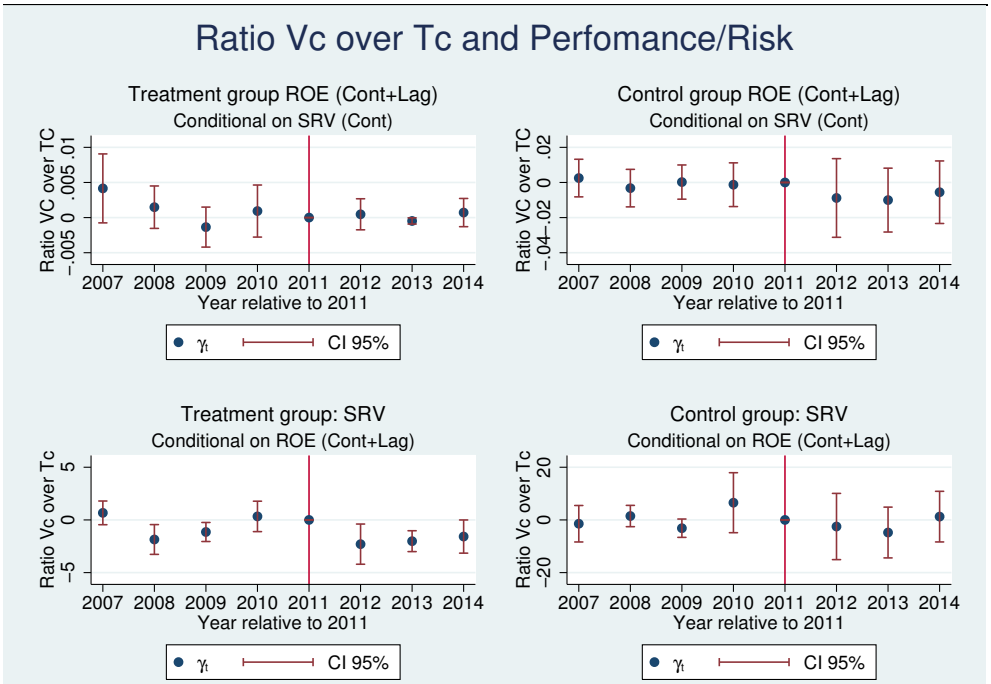


Average values for the share of variable compensation in the three years 2006, 2010 and 2014 for treated vs. other banks (Investment vs. Commercial banks).

Source: S&P Capital IQ.

Evolution of correlations over time

Figure 6



Each bullet refers to the estimated coefficient of equation (1) in a specific year. The confidence interval is represented by the vertical brackets around each bullet. Precision in the estimation is inversely measured by the height of the brackets: for the coefficient to be significant, the brackets should not contain the zero line. The top panels represent the sensitivity of the share of variable compensation to performance measured by ROE and its lagged value, respectively for treated and not-treated banks. The bottom panels refer to the sensitivity of the share of variable compensation to risk, measured by contemporaneous SRV. Standard errors clustered at bank level.

B Tables

Table 1: Summary Statistics: 2006-2014

	Mean	Standard deviation	Observations
		Bank variables	
Total Assets	1.52	9.05	1191
Tier1 Capital Ratio	11.80	4.65	854
ROE	0.13	0.58	1174
ROA	0.01	0.03	1181
Non-performing loan ratio	3.72	5.99	861
Stock Return Volatility	0.05	0.04	1168
Listed Banks	1.00	0.00	1193
Investment Banks	0.19	0.40	1193
North America & Australia	0.21	0.41	1193
Asia & Africa	0.36	0.48	1193
Europe	0.44	0.50	1193
		CEO compensation	
Fixed Salary	1.11	2.19	1193
Total Annual Compensation	3.84	5.63	1193
Variable Compensation over Total Compensation	0.51	0.29	1193
Cash Bonus over Variable Compensation	0.37	0.38	1145
Stock Option Awarding	0.37	0.48	1193

All variables are expressed in US dollars. Fixed Salary and Total Compensation are annual and measured in millions. Variable compensation is calculated as Total Compensation minus Fixed salary. Total Assets are measured in billions.

Table 2: Summary Statistics: Pre and Post-Financial crisis

	Pre-crisis (2006-07)		Post-crisis (2009-14)	
	Mean	Standard deviation	Mean	Standard deviation
		CEO compensation		
Fixed Salary	1.23	3.25	1.11	1.89
Total Annual Compensation	5.54	8.81	3.49	4.44
Variable Compensation over Total Compensation	0.59	0.28	0.49	0.30
Cash Bonus over Variable Compensation	0.48	0.38	0.34	0.37
Stock Option Awarding	0.39	0.49	0.36	0.48
		Bank performance and risk		
ROE	0.18	0.10	0.12	0.67
ROA	0.02	0.04	0.01	0.02
Non-performing loan ratio	2.21	3.60	4.30	6.64
Stock Return Volatility	0.04	0.02	0.05	0.04
Observations	233		842	

All variables are expressed in US dollars. Fixed salary and total compensation are annual and measured in millions. Variable compensation is calculated as total compensation minus fixed salary. When partitioning the sample we exclude the 2008 values from the descriptive statistics.

Table 3: Selection into the treatment policy

Dependent variable:	Treated$_t$ (0/1)				
	(1)	(2)	(3)	(4)	(5)
CEO-specific characteristics					
Age of the CEO$_t$	-0.0700			0.0263	0.0348
	(0.0904)			(0.106)	(0.119)
Sex of the CEO$_t$	-1.686			-1.850	-1.430
	(2.576)			(2.751)	(2.207)
Bank-specific characteristics					
ROE$_t$		1.770		-0.0559	
		(7.459)		(7.337)	
ROA$_t$			0.897		0.709
			(31.08)		(55.68)
Risk$_t$		16.20	10.61	15.85	18.61
		(33.75)	(22.33)	(42.11)	(39.68)
Diversification Ratio$_t$		-0.0872	0.000990	-0.115	-0.294
		(1.593)	(1.563)	(2.555)	(1.567)
Leverage Ratio$_t$ (E/A)		2.644	2.789	2.475	1.713
		(5.280)	(9.593)	(8.648)	(10.63)
Observations	1,199	956	956	864	864

Notes: The table shows the results of a test for dynamic sorting using different specifications. The test framework is a binary logit model using the treatment status of a bank (treated=1, not treated=0) as the dependent variable. The sample is restricted to observations before the treatment took place in 2012. The significance of a parameter indicates that banks are not randomly treated. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 4: Results for the baseline model (without treatment)

Dependent variable:	Variable over Total Compensation			
Profitability measure:	ROE		ROA	
	(1)	(2)	(3)	(4)
Profit	0.254***	0.628***	0.561*	4.999***
	(0.0759)	(0.118)	(0.321)	(0.864)
Post×Profit	-0.264***	-0.259*	0.386	0.575
	(0.0770)	(0.148)	(0.571)	(1.312)
Risk	-0.959***	-0.627**	-0.879***	-0.995***
	(0.249)	(0.263)	(0.190)	(0.238)
Post×Risk	-2.332***	-1.221**	-2.061***	-0.712
	(0.431)	(0.574)	(0.353)	(0.468)
Inv×Post		0.160**		0.116**
		(0.0653)		(0.0462)
Inv×Profit		-0.517***		-4.884***
		(0.152)		(0.919)
Inv×Post×Profit		0.171		0.066
		(0.175)		(1.454)
Inv×Risk		0.713		0.334
		(0.735)		(0.324)
Inv×Post×Risk		-4.220***		-3.030***
		(1.341)		(0.762)
Post	0.132***	0.104**	0.0770**	0.0432
	(0.0358)	(0.0419)	(0.0336)	(0.0367)
CEOentry	-0.0344**	-0.0318**	-0.0403***	-0.0413***
	(0.0145)	(0.0145)	(0.0145)	(0.0144)
GDPgrowth	0.00383	0.00426	0.00334	0.00312
	(0.00333)	(0.00330)	(0.00341)	(0.00337)
Time FE	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes
Within R^2	0.1549	0.1792	0.1313	0.1693
Observations	1,197	1,197	1,212	1,212

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Additional control included but not presented in the Table is $Post_t \times Inv_{ij}$. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 5: Results for the model with the treatment

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.341	6.453
	(0.407)	(4.543)
Post×Profit	-0.806*	-8.931**
	(0.437)	(4.459)
Treated×Profit	0.326	-1.486
	(0.416)	(4.593)
Inv×Profit	-0.133	-6.101
	(0.587)	(8.064)
Post×Treated×Profit	0.509	9.738**
	(0.427)	(4.448)
Post×Inv×Profit	-0.387	10.75
	(2.633)	(8.662)
Treated×Inv×Profit	-0.409	1.315
	(0.606)	(8.118)
Post×Treated×Inv×Profit	0.584	-10.96
	(2.636)	(8.693)
Risk	1.893**	1.522*
	(0.919)	(0.897)
Post×Risk	-0.649	1.339
	(1.845)	(1.685)
Treated×Risk	-2.501***	-2.551***
	(0.908)	(0.889)
Inv×Risk	-1.642	-1.693
	(1.796)	(1.658)
Post×Treated×Risk	-0.849	-2.253
	(1.756)	(1.610)
Post×Inv×Risk	-1.931	-1.859
	(11.54)	(9.623)
Treated×Inv×Risk	2.521	2.083
	(1.976)	(1.685)
Post×Treated×Inv×Risk	-2.371	-1.112
	(11.59)	(9.631)
CEOentry	-0.0288**	-0.0398***
	(0.0146)	(0.0145)
GDPgrowth	0.00421	0.00205
	(0.00339)	(0.00345)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.1951	0.1860
Observations	1,197	1,212

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Additional controls included but not presented in the Table are $Post_t \times Inv_{ij}$ and $Post_t \times Treated_{ij} \times Inv_{ij}$. Standard errors clustered at the bank level in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table 6: Sensitivity of Variable over Total Compensation to profitability (controlling for risk)

		pre	post	Δ
All	Not treated	0.310	-0.584	-0.895
		(0.330)	(0.753)	(0.692)
	Treated	0.543***	0.291***	-0.252**
		(0.0983)	(0.0965)	(0.119)
Commercial Banks	Not treated	0.341	-0.465	-0.806*
		(0.407)	(0.606)	(0.437)
	Treated	0.667***	0.370***	-0.297**
		(0.122)	(0.125)	(0.150)
Investment Banks	Not treated	0.208	-0.985	-1.193
		(0.428)	(2.553)	(2.605)
	Treated	0.126	0.0252	-0.100
		(0.107)	(0.0243)	(0.106)
Observations		1,197	1,197	1,197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 7: Sensitivity of Variable over Total Compensation to risk (controlling for ROE)

		pre	post	Δ
All	Not treated	1.516*	0.423	-1.093
		(0.812)	(3.048)	(2.979)
	Treated	-0.407	-2.893***	-2.486***
		(0.309)	(0.515)	(0.540)
Commercial Banks	Not treated	1.893**	1.243	-0.649
		(0.919)	(2.091)	(1.845)
	Treated	-0.609**	-2.107***	-1.498***
		(0.267)	(0.589)	(0.579)
Investment Banks	Not treated	0.251	-2.330	-2.580
		(1.590)	(11.28)	(11.40)
	Treated	0.270	-5.530***	-5.801***
		(0.850)	(1.044)	(1.280)
Observations		1,197	1,197	1,197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 8: Controlling for the presence of a CRO

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.560	11.72
	(0.745)	(7.691)
Post×Profit	0.0776	4.688
	(0.662)	(8.340)
Treated×Profit	-0.152	-10.65
	(0.755)	(7.695)
CRO×Profit	-0.299	-4.475
	(0.792)	(8.979)
Post×Treated×Profit	-0.385	-4.477
	(0.656)	(8.303)
Post×CRO×Profit	-0.694	-18.39*
	(0.903)	(10.34)
Treated×CRO×Profit	0.0221	3.513
	(0.807)	(8.997)
Post×Treated×CRO×Profit	0.870	20.08*
	(0.904)	(10.42)
Risk	6.499***	7.335***
	(2.319)	(2.399)
Post×Risk	-6.618*	-6.659*
	(3.388)	(3.523)
Treated×Risk	-5.575**	-6.310***
	(2.333)	(2.416)
CRO×Risk	-6.380***	-6.599***
	(2.404)	(2.488)
Post×Treated×Risk	3.520	3.994
	(3.334)	(3.460)
Post×CRO×Risk	7.766*	7.012
	(4.546)	(4.637)
Treated×CRO×Risk	3.739	4.340*
	(2.443)	(2.522)
Post×Treated×CRO×Risk	-6.879	-6.458
	(4.536)	(4.606)
CEOentry	-0.0332**	-0.0360**
	(0.0143)	(0.0144)
GDPgrowth	0.00119	0.000250
	(0.00341)	(0.00350)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.1847	0.1577
Observations	1197	1212

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Additional control included but not presented in the Table is $Post_t \times CRO_{ij}$. Standard errors clustered at the bank level in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table 9: Controlling for the presence of a CRO

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Profitability				
All	Not treated	0.411	0.144	-0.267
		(0.399)	(0.613)	(0.456)
	Treated	0.271***	0.0505	-0.220**
		(0.0827)	(0.0548)	(0.0863)
No CRO	Not treated	0.560	0.638	0.0776
		(0.745)	(1.038)	(0.662)
	Treated	0.408***	0.101	-0.308**
		(0.126)	(0.108)	(0.136)
CRO exists	Not treated	0.261	-0.355	-0.616
		(0.273)	(0.638)	(0.620)
	Treated	0.132	-0.000136	-0.132
		(0.0993)	(0.0166)	(0.100)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table 10: Controlling for the presence of a CRO

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Risk				
All	Not treated	3.326***	0.570	-2.756
		(1.261)	(2.500)	(2.280)
	Treated	-0.390	-3.047***	-2.657***
		(0.268)	(0.517)	(0.517)
No CRO	Not treated	6.499***	-0.119	-6.618*
		(2.319)	(3.980)	(3.388)
	Treated	0.923**	-2.174**	-3.097***
		(0.406)	(0.892)	(0.879)
CRO exists	Not treated	0.119	1.267	1.148
		(0.815)	(2.993)	(3.040)
	Treated	-1.718***	-3.929***	-2.211***
		(0.285)	(0.503)	(0.535)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table 11: Determinants of CEO entry

Dependent variable:	CEOentry$_t$ (0/1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.335**	-0.163	0.674	-0.383**	-0.225	0.519
	(0.148)	(0.361)	(0.555)	(0.167)	(0.406)	(0.570)
Treated		0.294	0.272			
		(0.211)	(0.399)			
Post × Treated		-0.204	-0.897		-0.189	-0.991
		(0.396)	(0.602)		(0.445)	(0.622)
ΔTotal compensation$_{t-1}$			0.0527			0.0686
			(0.0860)			(0.0796)
ROE$_{t-1}$			-0.333			-0.279
			(0.656)			(0.419)
Risk$_{t-1}$			4.225			-1.299
			(3.380)			(3.968)
Log total assets$_{t-1}$			0.127**			0.564
			(0.0567)			(0.348)
Constant	-1.761***	-2.006***	-4.086***			
	(0.0758)	(0.194)	(0.778)			
Bank FE	No	No	No	Yes	Yes	Yes
Observations	2,021	2,021	989	1,361	1,361	685

Notes: The table shows the result of a logit model with CEO entry (Value of 1 if a new CEO enters the bank in year t, 0 otherwise) as the dependent variable. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

C Annex: Other results and robustness checks

Table A.1: Robustness: Not controlling for bank business model

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.360	3.339
	(0.266)	(3.632)
Post×Profit	-0.795*	-6.512*
	(0.407)	(3.683)
Treated×Profit	0.116	0.0137
	(0.269)	(3.639)
Post×Treated×Profit	0.591	7.252**
	(0.403)	(3.693)
Risk	1.941*	1.508
	(1.001)	(0.969)
Post×Risk	-0.915	-0.520
	(1.621)	(1.500)
Treated×Risk	-2.310***	-2.113***
	(0.795)	(0.764)
Post×Treated×Risk	-0.884	-1.325
	(1.576)	(1.447)
CEOentry	-0.0300**	-0.0375***
	(0.0146)	(0.0144)
GDPgrowth	0.00296	0.00178
	(0.00335)	(0.00342)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.1821	0.1653
Observations	1,197	1,212

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.2: Robustness: Not controlling for bank business model

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Profitability				
All	Not treated	0.360	-0.435	-0.795*
		(0.266)	(0.489)	(0.407)
	Treated	0.476***	0.273***	-0.203**
		(0.0923)	(0.0758)	(0.0851)
Observations		1,197	1,197	1,197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table A.3: Robustness: Not controlling for bank business model

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Risk				
All	Not treated	1.405*	0.491	-0.915
		(0.797)	(1.868)	(1.621)
	Treated	-0.904***	-2.704***	-1.799***
		(0.274)	(0.490)	(0.482)
Observations		1,197	1,197	1,197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table A.4: Robustness: Controlling for banking crisis

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.338	6.281
	(0.406)	(4.533)
Post×Profit	-0.933**	-9.847**
	(0.439)	(4.465)
Treated×Profit	0.345	-1.356
	(0.415)	(4.583)
Inv×Profit	-0.125	-5.716
	(0.586)	(8.047)
Post×Treated×Profit	0.515	9.395**
	(0.426)	(4.440)
Post×Inv×Profit	-0.255	11.68
	(2.627)	(8.650)
Treated×Inv×Profit	-0.414	1.007
	(0.604)	(8.100)
Post×Treated×Inv×Profit	0.549	-10.92
	(2.629)	(8.672)
Risk	1.919**	1.519*
	(0.917)	(0.895)
Post×Risk	-1.168	0.802
	(1.853)	(1.696)
Treated×Risk	-2.530***	-2.582***
	(0.906)	(0.887)
Inv×Risk	-1.695	-1.752
	(1.792)	(1.654)
Post×Treated×Risk	-0.137	-1.452
	(1.776)	(1.641)
Post×Inv×Risk	-1.297	-1.115
	(11.52)	(9.605)
Treated×Inv×Risk	2.715	2.175
	(1.973)	(1.681)
Post×Treated×Inv×Risk	-2.964	-1.918
	(11.57)	(9.614)
CEOentry	-0.0309**	-0.0412***
	(0.0146)	(0.0144)
GDPgrowth	0.00585*	0.00359
	(0.00345)	(0.00351)
Post×FinancialCrisis	-0.0598**	-0.0605**
	(0.0246)	(0.0253)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.1951	0.1860
Observations	1197	1212

Notes: The dataset in Laeven and Valencia (2012) does not contain information for Malta, Cyprus and Oman. In this regression we have included the three countries by classifying the last one as a country without a banking crisis. Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.5: Robustness: Controlling for banking crisis

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Profitability				
All	Not treated	0.310	-0.682	-0.992
		(0.329)	(0.752)	(0.691)
	Treated	0.560***	0.208**	-0.351***
		(0.0983)	(0.102)	(0.125)
Commercial Banks	Not treated	0.338	-0.595	0.933**
		(0.406)	(0.607)	(0.439)
	Treated	0.683***	0.265**	-0.419**
		(0.122)	(0.132)	(0.158)
Investment Banks	Not treated	0.213	-0.975	-1.188
		(0.427)	(2.547)	(2.598)
	Treated	0.144	0.0202	-0.124
		(0.107)	(0.0243)	(0.106)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table A.6: Robustness: Controlling for banking crisis

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Risk				
All	Not treated	1.530*	0.0644	-1.465
		(0.810)	(3.044)	(2.975)
	Treated	-0.377	-2.660***	-2.283***
		(0.308)	(0.522)	(0.545)
Commercial Banks	Not treated	1.919**	0.751	-1.168
		(0.917)	(2.096)	(1.853)
	Treated	-0.611**	-1.916***	-1.305**
		(0.267)	(0.593)	(0.583)
Investment Banks	Not treated	0.224	-2.240	-2.464
		(1.586)	(11.25)	(11.37)
	Treated	0.409	-5.156***	-5.565***
		(0.850)	(1.053)	(1.281)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$ and $^{***}\ p < 0.01$.

Table A.7: Robustness: Countries with a sovereign debt crisis

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.348	6.328
	(0.407)	(4.526)
Post×Profit	-0.839*	-9.151**
	(0.438)	(4.459)
Treated×Profit	0.297	-1.876
	(0.417)	(4.582)
Inv×Profit	-0.146	-5.957
	(0.586)	(8.034)
Post×Treated×Profit	0.434	8.805**
	(0.428)	(4.448)
Post×Inv×Profit	-0.376	11.00
	(2.630)	(8.631)
Treated×Inv×Profit	-0.421	1.638
	(0.606)	(8.091)
Post×Treated×Inv×Profit	0.730	-7.186
	(2.634)	(8.756)
Risk	1.929**	1.519*
	(0.919)	(0.896)
Post×Risk	-0.801	1.139
	(1.854)	(1.682)
Treated×Risk	-2.548***	-2.573***
	(0.908)	(0.887)
Inv×Risk	-1.682	-1.712
	(1.793)	(1.652)
Post×Treated×Risk	-0.380	-1.786
	(1.770)	(1.615)
Post×Inv×Risk	-1.672	-1.630
	(11.53)	(9.586)
Treated×Inv×Risk	2.565	2.123
	(1.975)	(1.679)
Post×Treated×Inv×Risk	-3.009	-1.660
	(11.60)	(9.596)
CEOentry	-0.0288**	-0.0405***
	(0.0147)	(0.0145)
GDPgrowth	0.00389	0.00261
	(0.00345)	(0.00351)
PIIGS×Post2011	-0.105**	-0.106**
	(0.0431)	(0.0419)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.1970	0.1916
Observations	1176	1191

Notes: In this regression we have included a dummy that identifies PIIGS countries (Portugal, Ireland, Italy, Greece and Spain) interacted with a dummy variable that takes value equal to one in the years subsequent to 2011. Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.8: Robustness: Countries with a sovereign debt crisis

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Profitability				
All	Not treated	0.315	-0.611	-0.925
		(0.329)	(0.753)	(0.692)
	Treated	0.514***	0.191*	-0.323**
		(0.103)	(0.115)	(0.130)
Commercial Banks	Not treated	0.348	-0.491	-0.839*
		(0.407)	(0.606)	(0.438)
	Treated	0.645***	0.240	-0.405**
		(0.129)	(0.148)	(0.165)
Investment Banks	Not treated	0.202	-1.013	-1.215
		(0.427)	(2.550)	(2.602)
	Treated	0.0770	0.0265	-0.0505
		(0.110)	(0.0287)	(0.109)
Observations		1176	1176	1176

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.9: Robustness: Countries with a sovereign debt crisis

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Risk				
All	Not treated	1.543*	0.359	-1.184
		(0.813)	(3.046)	(2.977)
	Treated	-0.416	-2.671***	-2.255***
		(0.312)	(0.587)	(0.600)
Commercial Banks	Not treated	1.929**	1.129	-0.801
		(0.919)	(2.098)	(1.854)
	Treated	-0.619**	-1.799***	-1.180*
		(0.271)	(0.665)	(0.647)
Investment Banks	Not treated	0.247	-2.225	-2.473
		(1.588)	(11.26)	(11.38)
	Treated	0.264	-5.597***	-5.862***
		(0.856)	(1.239)	(1.435)
Observations		1176	1176	1176

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.10: Robustness: The timing of the regulatory changes

Dependent variable:	Variable over Total Compensation	
Profitability measure:	ROE	ROA
	(1)	(2)
Profit	0.350	6.529
	(0.407)	(4.535)
Post×Profit	-0.924**	-10.12**
	(0.445)	(4.542)
Treated×Profit	0.336	-1.535
	(0.416)	(4.586)
Inv×Profit	-0.141	-6.387
	(0.586)	(8.050)
Post×Treated×Profit	0.668	11.34**
	(0.439)	(4.561)
Post×Inv×Profit	-0.268	11.97
	(2.630)	(8.689)
Treated×Inv×Profit	-0.423	1.692
	(0.605)	(8.104)
Post×Treated×Inv×Profit	0.434	-12.41
	(2.633)	(8.726)
Risk	2.019**	1.665*
	(0.921)	(0.900)
Post×Risk	-1.316	0.463
	(1.889)	(1.764)
Treated×Risk	-2.578***	-2.653***
	(0.908)	(0.889)
Inv×Risk	-1.736	-1.797
	(1.794)	(1.656)
Post×Treated×Risk	-0.299	-1.596
	(1.787)	(1.661)
Post×Inv×Risk	-1.439	-1.269
	(11.54)	(9.632)
Treated×Inv×Risk	2.544	2.159
	(1.973)	(1.682)
Post×Treated×Inv×Risk	-2.917	-1.479
	(11.60)	(9.635)
CEOentry	-0.0285*	-0.0395***
	(0.0146)	(0.0144)
GDPgrowth	0.00421	0.00181
	(0.00340)	(0.00346)
UK×Post2009	0.0420	0.0382
	(0.0388)	(0.0395)
FSB(excl.UK)×Post	-0.0468*	-0.0493*
	(0.0267)	(0.0269)
EU(non-FSB)×Post2014	0.0107	0.0213
	(0.0390)	(0.0400)
Time FE	Yes	Yes
Individual FE	Yes	Yes
Within R^2	0.2004	0.1917
Observations	1197	1212

Notes: In this regression we have included three additional dummies: 1) UK×Post2009 that takes value equal to one of the UK after 2009; 2) FSB(excl.UK)×Post that identifies FSB countries in the post period; 3) EU(non-FSB)×Post2014 that identifies European countries that do not belong to FSB group after 2014. Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Where necessary, the contemporaneous and lagged coefficient values are summed up for brevity. Additional control included but not presented in the Table is $Post_t \times Inv_{ij}$. Standard errors clustered at the bank level in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.11: Robustness: The timing of the regulatory changes

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Profitability				
All	Not treated	0.317	-0.668	-0.986
		(0.329)	(0.755)	(0.694)
	Treated	0.556***	0.338***	-0.218*
		(0.0986)	(0.0983)	(0.120)
Commercial Banks	Not treated	0.350	-0.574	-0.924**
		(0.407)	(0.610)	(0.445)
	Treated	0.685***	0.430***	-0.256*
		(0.122)	(0.127)	(0.151)
Investment Banks	Not treated	0.208	-0.984	-1.192
		(0.427)	(2.549)	(2.600)
	Treated	0.121	0.0305	-0.0902
		(0.107)	(0.0244)	(0.106)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table A.12: Robustness: The timing of the regulatory changes

Dependent variable:		Variable over Total Compensation		
		pre	post	Δ
Risk				
All	Not treated	1.620**	-0.0262	-1.646
		(0.814)	(3.054)	(2.990)
	Treated	-0.374	-2.989***	-2.615***
		(0.310)	(0.519)	(0.547)
Commercial Banks	Not treated	2.019**	0.703	-1.316
		(0.921)	(2.115)	(1.889)
	Treated	-0.559**	-2.174***	-1.615***
		(0.269)	(0.593)	(0.587)
Commercial Banks	Not treated	0.282	-2.473	-2.755
		(1.587)	(11.26)	(11.38)
	Treated	0.248	-5.723***	-5.971***
		(0.849)	(1.048)	(1.283)
Observations		1197	1197	1197

Notes: Among the explanatory variables we consider the contemporaneous values for risk and profitability and include one-period lagged value for the latter. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

D Variable definitions and lists of banks in the sample

Table D.1: Variable definition and source

Variable	Definition	Source
CEO level variables		
Total compensation (TC)	All cash and non-cash compensation paid to a bank CEO in the year	Capital IQ-People Intelligence
Variable compensation (VC)	Total Compensation less the Fixed Salary	Id.
VC over TC	The percentage of Variable Compensation over Total Compensation	Id.
CEO entry	Dummy variable taking value of 1 if a new CEO was appointed during the year	Id.
CEO age, sex	Age and sex of the CEO	Id.
Bank level variables		
SRV	Standard deviation of weekly stock returns over the year (only listed banks)	Eikon (Thomson Reuters)
NPL	Non-performing loans	Capital IQ-People Intelligence
ROE	Return on Equity	Id.
ROA	Return on Assets	Id.
Tier 1	Tier 1 Capital ratio	Id.
TA	Total Assets	Id.
Retail Ratio	Ratio between net loans + total deposits and TA	Id.
Inv	Dummy variable taking value of 1 if the bank is an investment bank (SIC code above 6099)	Id.
CRO	Dummy variable taking value of 1 if a CRO exists in the bank	Own calculation based on Capital IQ-People Intelligence
Country level variables		
GDP	GDP of the country where the bank is located	IFS from IMF
Financial crisis	Dummy taking value of 1 in the years 2008 and 2009	Our own def.
Treatment variables		
Treated	Dummy variable taking value of 1 if the bank belongs to a type of bank and country within the scope of the P&S	FSB reports I-IV
G-SIBs	Dummy variable taking value of 1 if the bank is classified as G-SIBs (global systemically important banks)	FSB list

Table D.2: List of banks

Country	*Company Name*	*Treatment (FSB)*	*EU not FSB member*	*G-SIBs*
Australia	AMP Limited	1	0	0
Australia	Australia & New Zealand Banking Group Limited	1	0	0
Australia	Bank of Queensland Ltd.	1	0	0
Australia	Bendigo and Adelaide Bank Limited	1	0	0
Australia	Challenger Limited	1	0	0
Australia	Commonwealth Bank of Australia	1	0	0
Australia	Macquarie Group Limited	1	0	0
Australia	National Australia Bank Limited	1	0	0
Australia	Westpac Banking Corporation	1	0	0
Austria	Erste Group Bank AG	0	1	0
Austria	Raiffeisen Bank International AG	0	1	0
Bangladesh	Eastern Bank Limited	0	0	0
Belgium	BHF Kleinwort Benson Group SA	0	1	0
Belgium	Dexia SA	0	1	0
Belgium	KBC Group NV	0	1	0
Botswana	Barclays Bank of Botswana Limited	0	0	0
Canada	Bank of Montreal	1	0	0
Canada	Canadian Imperial Bank of Commerce	1	0	0
Canada	Canadian Western Bank	1	0	0
Canada	First National Financial Corporation	1	0	0
Canada	Home Capital Group Inc.	1	0	0
Canada	Laurentian Bank of Canada	1	0	0
Canada	National Bank of Canada	1	0	0
Canada	Royal Bank of Canada	1	0	0
Canada	The Bank of Nova Scotia	1	0	0
Canada	The Toronto-Dominion Bank	1	0	0
China	Agricultural Bank of China Limited	1	0	1
China	Bank of China Limited	1	0	1
China	Bank of Communications Co., Ltd.	1	0	0
China	China CITIC Bank Corporation Ltd.	1	0	0
China	China Construction Bank Corporation	1	0	1
China	China Everbright Bank Co., Ltd.	1	0	0
China	China Merchants Bank Co., Ltd.	1	0	0
China	Industrial and Commercial Bank of China Limited	1	0	1
Cyprus	Bank of Cyprus Public Company Limited	0	1	0
Cyprus	Hellenic Bank Public Company Limited	0	1	0
Cyprus	SFS Group Public Company Limited	0	1	0
Czech Republic	Komercni Banka AS	0	1	0
Denmark	Danske Bank A/S	0	1	0
Denmark	Spar Nord Bank A/S	0	1	0
Denmark	Sydbank A/S	0	1	0
Finland	Aktia Bank PLC	0	1	0
France	BNP Paribas SA	1	0	1
France	Credit Agricole S.A.	1	0	1
France	CrÃ©dit Industriel et Commercial	1	0	0
France	Natixis	1	0	0
France	Societe Generale Group	1	0	1
Germany	Commerzbank AG	1	0	0
Germany	Deutsche Bank AG	1	0	1
Germany	Deutsche Boerse AG	1	0	0
Greece	Hellenic Exchanges - Athens Stock Exchange S.A. Holding	0	1	0
Greece	National Bank of Greece S.A.	0	1	0
Hong Kong	Allied Group Limited	1	0	0
Hong Kong	Allied Properties (H.K.) Limited	1	0	0
Hong Kong	China Everbright Ltd.	1	0	0
Hong Kong	Chong Hing Bank Limited	1	0	0
Hong Kong	Dah Sing Banking Group Limited	1	0	0
Hong Kong	Dah Sing Financial Holdings Limited	1	0	0
Hong Kong	Hang Seng Bank Limited	1	0	0
Hong Kong	Hong Kong Exchanges & Clearing Limited	1	0	0
Hong Kong	Public Financial Holdings Limited	1	0	0
Hong Kong	The Bank of East Asia, Limited	1	0	0
India	AXIS Bank Limited	1	0	0
India	Bank of Baroda	1	0	0
India	Canara Bank Limited	1	0	0
India	HDFC Bank Ltd.	1	0	0
India	Housing Development Finance Corporation Limited	1	0	0
India	ICICI Bank Ltd.	1	0	0
Ireland	Allied Irish Banks, p.l.c.	0	1	0
Ireland	The Governor and Company of the Bank of Ireland	0	1	0
Ireland	permanent tsb Group Holdings p.l.c.	0	1	0
Israel	Bank Hapoalim B.M.	0	0	0
Israel	Bank Leumi Le-Israel BM	0	0	0
Israel	Bank of Jerusalem Ltd.	0	0	0
Israel	Dexia Israel Bank Ltd.	0	0	0
Israel	First International Bank of Israel Ltd.	0	0	0
Israel	Israel Discount Bank Limited	0	0	0

Continuation of the list of banks

Country	*Company Name*	*Treatment (FSB)*	*EU not FSB member*	*G-SIBs*
Israel	Mizrahi Tefahot Bank, Ltd.	0	0	0
Israel	Union Bank of Israel Limited	0	0	0
Italy	Banca Carige S.p.A.	1	0	0
Italy	Banca Monte dei Paschi di Siena S.p.A.	1	0	0
Italy	Banca popolare dell'Emilia Romagna, SocietÃ cooperativa.	1	0	0
Italy	Banco Popolare Societa Cooperativa Scarl	1	0	0
Italy	Intesa Sanpaolo S.p.A.	1	0	0
Italy	Mediobanca Banca di Credito Finanziario S.p.A.	1	0	0
Italy	UniCredit S.p.A.	1	0	1
Italy	Unione di Banche Italiane S.p.A.	1	0	0
Japan	Nomura Holdings, Inc.	1	0	0
Japan	Sumitomo Mitsui Financial Group, Inc.	1	0	1
Jordan	Arab Bank Plc	0	0	0
Jordan	Arab Banking Corporation (Jordan)	0	0	0
Jordan	Bank of Jordan	0	0	0
Jordan	Cairo Amman Bank	0	0	0
Jordan	Capital Bank of Jordan	0	0	0
Jordan	InvestBank	0	0	0
Malaysia	Hong Leong Bank Berhad	0	0	0
Malaysia	Hong Leong Financial Group Berhad	0	0	0
Malaysia	Malayan Banking Berhad	0	0	0
Malaysia	Public Bank Berhad	0	0	0
Malta	Brait S.E.	0	1	0
Mauritius	MCB Group Limited	0	0	0
Norway	DNB ASA	0	0	0
Norway	SpareBank 1 Nord-Norge	0	0	0
Norway	SpareBank 1 SMN	0	0	0
Norway	SpareBank 1 SR-Bank	0	0	0
Norway	Sparebanken MÃžre	0	0	0
Norway	Sparebanken SÃžr	0	0	0
Norway	Sparebanken Vest	0	0	0
Oman	National Securities Co. SAOG	0	0	0
Pakistan	Bank AL Habib Limited	0	0	0
Pakistan	Meezan Bank Limited	0	0	0
Poland	Alior Bank SA	0	1	0
Poland	Bank BGZ BNP Paribas S.A.	0	1	0
Poland	Bank BPH SA	0	1	0
Poland	Bank Handlowy W Warszawie SA	0	1	0
Poland	Bank Millennium SA	0	1	0
Poland	Bank Ochrony Srodowiska SA	0	1	0
Poland	Bank Polska Kasa Opieki SA	0	1	0
Poland	Bank Zachodni WBK S.A.	0	1	0
Poland	Getin Noble Bank SA	0	1	0
Poland	ING Bank Slaski SA	0	1	0
Poland	Powszechna Kasa Oszczednosci Bank Polski SA	0	1	0
Poland	mBank SA	0	1	0
Portugal	Banco Comercial PortuguÃªs S.A.	0	1	0
Portugal	Banco EspÃrito Santo, S.A.	0	1	0
Portugal	Banif - Banco Internacional do Funchal, S.A.	0	1	0
Portugal	Sonae Capital, S.g.p.s., S.a.	0	1	0
Singapore	DBS Group Holdings Ltd	1	0	0
Singapore	Hong Leong Finance Limited	1	0	0
Singapore	Oversea-Chinese Banking Corporation Limited	1	0	0
Singapore	Singapore Exchange Limited	1	0	0
Singapore	UOB-Kay Hian Holdings Limited	1	0	0
Singapore	United Overseas Bank Limited	1	0	0
South Africa	African Bank Investments Limited	1	0	0
South Africa	Barclays Africa Group Limited	1	0	0
South Africa	Capitec Bank Holdings Ltd.	1	0	0
South Africa	Coronation Fund Managers Limited	1	0	0
South Africa	FirstRand Limited	1	0	0
South Africa	Investec Limited	1	0	0
South Africa	JSE Limited	1	0	0
South Africa	Nedbank Group Limited	1	0	0
South Africa	Nedbank Limited	1	0	0
South Africa	Standard Bank Group Limited	1	0	0
Spain	Banco Bilbao Vizcaya Argentaria, S.A.	1	0	0
Spain	Banco Popular Espanol S.A.	1	0	0
Spain	Banco Santander, S.A.	1	0	1
Spain	Bankia, S.A.	1	0	0
Spain	Bankinter, S.A.	1	0	0
Spain	Liberbank, S.A.	1	0	0
Sweden	Nordea Bank AB (publ)	0	1	1
Sweden	Skandinaviska Enskilda Banken AB (publ)	0	1	0
Sweden	Swedbank AB (publ)	0	1	0
Switzerland	Banque Cantonale Vaudoise	1	0	0
Switzerland	Julius Baer Group Ltd.	1	0	0
Switzerland	St.Galler Kantonalbank AG	1	0	0

Continuation of the list of banks

Country	*Company Name*	*Treatment (FSB)*	*EU not FSB member*	*G-SIBs*
Switzerland	UBS Group AG	1	0	1
United Kingdom	Barclays PLC	1	0	1
United Kingdom	HSBC Holdings plc	1	0	1
United Kingdom	Lloyds Banking Group plc	1	0	0
United Kingdom	London Stock Exchange Group plc	1	0	0
United Kingdom	Nationwide Building Society	1	0	0
United Kingdom	Standard Chartered PLC	1	0	1
United Kingdom	The Royal Bank of Scotland Group plc	1	0	1
United States	Bank of America Corporation	1	0	1
United States	Federal Home Loan Mortgage Corporation	1	0	0
United States	Federal National Mortgage Association	1	0	0
United States	JPMorgan Chase & Co.	1	0	1
United States	Lehman Brothers Holdings, Inc.	1	0	0
United States	Morgan Stanley	1	0	1
United States	The Bank of New York Mellon Corporation	1	0	1
United States	The Goldman Sachs Group, Inc.	1	0	1
United States	U.S. Bancorp	1	0	0
United States	Wells Fargo & Company	1	0	1

Treatment (FSB) takes value equal to 1 if the bank is under the treatment because of the FSB membership

EU not FSB member takes value equal to 1 if the bank does belong to the EU but does not to the FSB

G-SIBs takes value equal to 1 if the bank belongs to the group of systemically important banks