Does regulating remuneration affect the market value of European banks? Large versus small/medium sized banks

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Abstract

The aim of this paper is to analyze equity market reactions to the European Union mandatory regulation of remuneration policies in financial institutions. Using event study methodology, we investigated market reactions to the first European Directive on compensation policies after the crisis using a sample of 124 banks operating in the European Union. We divided the sample into two groups according to bank size considering four criteria (US Dodd-Frank Act 2010, Liikanen Report 2012, G-SIBs 2011 and ECB 2014). We found strong evidence of an average negative market reaction to compensation regulation to be stronger for large banks. Our results indicate that the regulation was not perceived as beneficial from a shareholder perspective and that size is an important variable that regulators should consider.

Keywords: banks size, corporate governance, European banks, event study, remuneration regulation.

1. Introduction and motivation

The financial crisis revealed flaws in the operation of corporate governance principles in the financial services sector, particularly regarding banks (COM 2010). The excessive risk-taking by banks during the pre-crisis period led to the failure of several financial institutions and systemic problems all over the world. The inappropriate remuneration structures of some financial entities were considered one of the main causes of such risk taking and of corporate failures (COM, 2010), with some authors laying blame for the crisis on banks (Mülbert 2010). Therefore, the debate on banker remuneration has captured the attention of both the public and policy makers (Avgouleas & Cullen 2014).

Voluntary compliance with Governance Codes has been insufficient to control executive pay in banks, leading to a need to regulate with hard law (i.e. mandatory rules). Governance Codes have been usually developed under the principle of "comply or explain". The lack of a legal obligation to comply with recommendations and the absence of deterrent penalties can explain the failure of financial institutions to effectively implement the corporate governance principles included in Governance Codes. Moreover, the existing recommendations are too broad and apply equally to different industries (financial and non-financial), to small and large firms, and to firms belonging to different legal systems with differing degrees of investor protection (common law and civil law countries). As a result, in recent years, several aspects of corporate governance have been subject to hard-law regulation in the European Union for the benefit of shareholders.

Although remuneration has been one of the main issues to undergo regulation, shareholder rights (Directive 2007/36/EC) and transparency/non-financial information disclosure (Directive 2014/95/EU) have also been regulated. Regarding remuneration, Directive 2010/76/EU of the European Parliament and of the Council, which amends Directives 2006/48/EC and 2006/49/EC as regards capital requirements for the trading book and for re-securitizations, and the supervisory review of remuneration policies, was the first regulatory initiative following the crisis. This Directive requires credit institution and investment firm[1] remuneration policies to consider present and future risks and to define categories of staff whose professional activities have a material impact on their risk profile (Ben Shlomo *et al.* 2013).

Mandatory regulation on executive remuneration in banks can restore bank health, reduce risk-taking and contribute to the stability of the financial system (Bebchuk & Spamann 2009; Bebchuk *et al.* 2010; Avgouleas & Cullen 2014). Therefore, regulation should be of potential value to banks.

Studies of the valuation effects of governance reforms are scarce for two main reasons (Black & Khanna 2007). First, news of legislation often emerges gradually, making it hard to identify an event date or a short event period (Bhagat & Romano 2002a, 2002b). Even if a limited event period can be identified, governance rules usually apply to all the firms in a country, which makes it difficult to assess whether the governance reform caused the observed returns.

Moreover, the *Green Paper: Corporate Governance in Financial Institutions and Remuneration Policies,* published 2 June 2010, established that the application of measures to improve remuneration policies in financial institutions should be proportionate and vary according to the legal form, nature and complexity of the financial institution concerned, the various existing legal and economic models, and size. Size has become especially relevant as different regulations and organizations in the European Union and worldwide have been considering different thresholds to distinguish large from small banks (US Dodd-Frank Act 2010[2], Global Systemically Important Banks -G-SIBs- determined by the Financial Stability Board since 2011, Liikanen Report 2012, European Central Bank 2014); and market reaction to a specific remuneration regulation that is applicable equally to banks of different sizes (such as Directive 2010/76/EU) can vary according to bank size.

To overcome the above limitations this study examines investor reaction in several European stock markets to Directive 2010/76/EU. Our aim is to analyze whether such regulation of executive compensation created value for shareholders. To this end, we conducted an event study of a pooled sample of 124 banks operating in the European Union. In addition, we analyzed whether the results depended on bank size by dividing the sample into two groups: large banks, and medium and small sized banks.

Our results show that, in terms of the market reaction, the Directive 2010/76/EC has not proved effective in protecting shareholders. It has been considered harmful mainly to large banks and it has not increased investor confidence in the EU market. Although until now, remuneration regulation has applied in the banking industry regardless of bank size,

the results of this study show that the effect of regulation depends on bank size. This study, which is useful to a multidisciplinary target audience, including economists, lawyers, political scientists and practitioners, has two important policy implications: first, policy-makers should consider banks size when making regulations; and second, there should be a consistent breakpoint to classify large and medium/small banks.

2. Literature review

The debate on the relationship between executive compensation and risk focuses on the amount of compensation and the link between the compensation and short- and long-term performance. While some studies find that high executive compensation is associated with the riskiest financial institutions, (authors such as Adams and Mehran (2003), Bebchuk et al. (2010) and Cheng et al. (2015), find evidence that those banks with higher compensation are riskier), others find no correlation between remuneration structures and risk (Mülbert 2010).

It begs the question of whether banks pay higher remunerations to their executives than other sectors do. As Gregg, Jewell, and Tonks (2012) and DeYoung et al. (2013) point out, total compensation paid to bank executives was not significantly higher than that paid to nonfinancial firm executives during the pre-crisis period.

Regarding the link between compensation and performance, from a theoretical point of view, it can be established that bank managers who receive a significant part of their compensation based on short-term performance are more likely to seek riskier investment strategies that increase short-term share prices but do not guarantee long-term bank sustainability. However, empirical evidence is mixed. As Haan and Vlahu (2016) argue, while some authors support this statement and find that stock-based compensation causes executives to focus on short-term stock price developments (Mehran 1992; Peng & Röel 2008; Bebchuk & Spaman 2009), others show that banks with higher variable compensation (in stock options or cash bonuses) did not perform worse during the crisis (Fahlenbrach & Stulz 2011). Moreover, John et al. (2008) report that bank CEO compensation based on pay-for-performance is negatively related to risk. Some authors even conclude that executive equity-based compensation is unrelated to bank risk (Houston & James 1995; John & Qian 2003; Mehran & Rosenberg 2008).

Nevertheless, contrary to what many raised after the crisis, financial institutions did not use short-term executive pay to a greater extent than other sectors did. As pointed out by Gopalan *et al.* (2014), executive compensation in the financial sector is more long-term oriented than in other industries.

In sum, despite a lack of hard evidence, proposals to reform compensation structures in financial institutions focus on the fact that short-term-oriented remuneration structures were a major cause of the financial crisis. And, in this context, Directive 2010/76/EC was developed and finally passed on 24 November 2010[3].

Directives are legal acts of the European Union that are binding on the Member States to which they are addressed, which may be one or a group of Members. Their most distinctive feature is the absence of direct effectiveness in the target legal systems, so that they require transposition by the Member State in order for the directive to enter into force. Thus, directives contain objectives that the states are expected to meet by means of national law, within a deadline. That is, a directive is binding upon each Member State to which it is addressed as to the result to be achieved, but the national authorities have the choice of form and methods of how to achieve this. Although transposition is followed through on different dates in each country (i.e. 2010 in Germany, 2012 in Spain), the first announcement shareholders receive of the event is the passing of the Directive, and any informational effects can be found around that date.

Directive 2010/76/EC focuses on two main issues: first, greater transparency in compensation policy, which must be consistent with effective risk management and, second, the limit to variable compensation and the need to link it to long-term performance.

Regarding the former, Directive 2010/76/EC establishes that credit entities and investment firms must show in detail the information on remuneration policy and practices regarding employees whose professional activities have an important impact on their risk profile[4] and provide such information to the public at least once a year. Compensation policies and practices for these employees must be consistent with sound and effective risk management[5]. The Directive also requires credit institutions and investment firms that are significant in terms of their size, internal organization and the nature, scope and complexity of their activities, to establish a remuneration committee as an integral part of their governance structure and organization.

Regarding the second issue, Directive 2010/76/EC establishes the obligation to limit variable compensation as a percentage of total net income (Galeano 2013; Sánchez-Calero 2013) with the aim of ensuring that employee incentives are aligned to the credit entity's long-term interests and to minimize excessive risk taking (Espinosa *et al.* 2011). Since bank managers who receive a significant part of their compensation based on short-term performance are more likely to seek riskier investment strategies that increase short-term prices, establishing a limit to variable remuneration would avoid focusing on short-term interests to focus on long-term bank sustainability (Vlahu, 2016).

According to the Directive, an evaluation of performance-based aspects of compensation should focus on long-term performance and account for outstanding risks associated with performance. Risk evaluation must be done in a multi-year framework – three to five years minimum – to ensure it will address long-term results and that the payment of performance-based pay is distributed throughout the business cycle of the credit institution or investment firm. To further align incentives, a substantial portion of the variable remuneration of all staff members covered by those requirements should consist of shares or instruments linked to shares of the listed credit institution or investment firm.

The Directive also states limits for variable compensation to certain groups. At least 40% of the annual variable remuneration paid to certain groups must be deferred over time, and 50% is payable in equity instruments, which must be retained for an additional period of time (Espinosa *et al.* 2011). If company results worsen, the variable remuneration of certain groups should be reduced.

One important research question is whether or not one specific regulation is seen as positive by investors, and therefore shareholders' value increase. Focusing on Corporate Governance regulation in general and remuneration regulation in particular, studies assessing shareholders' value reaction to the adoption of the regulation have had mixed results (Díaz *et al.* 2017).

In the United States shareholders' value reaction to the adoption of the Sarbanes-Oxley Act[6] (SOX) has been both positive (Li *et al.* 2008) and negative (Litvak 2007a; Zhang 2007). For India, adoption of the major governance reform (Clause 49[7]) was accompanied by an increase in the price of large firms (Black & Khanna 2007). In Korea, board structure reforms predict higher market values for large public firms (Black & Kim 2012). The adoption of mandatory disclosure rules also forecasts positive returns, as reported by

Greenstone *et al.* (2006), when analyzing the 1964 Securities Acts Amendments in the US that extended the mandatory disclosure requirements to large firms traded over the counter. For Europe Armstrong *et al.* (2010) find similar results. They examine European stock market reactions to 16 events associated with the adoption of International Financial Reporting Standards (IFRS) in Europe. They find a positive reaction for firms with lower quality pre-adoption information, which is more pronounced for banks, and with higher pre-adoption information asymmetry, consistent with investors expecting net information quality benefits from IFRS adoption.

Focusing on remuneration hard-law regulation the literature proposes two alternative hypotheses to explain the relationship between this regulation and market value.

If observable remuneration contracts are efficient, they should align managers´ interests with the owner objective of shareholder value maximization (Jensen & Meckling 1976). Efficient contracting is a solution to mitigate agency problems that results when shareholders entrust on managers to manage their firms, and they could cover features such as bonuses tied to firm performance or stock option plans (Bertrand, 2009). Therefore, hard-law regulation of remuneration practices would not be necessary, and its development would decrease shareholders' value.

However, if observable remuneration contracts do not represent efficient contractual outcomes, but serve as a vehicle for powerful managers to extract inappropriate compensation (Bebchuck & Fried 2003) at the expense of shareholders, regulating by hard-law remuneration practices would increase shareholders' value and would avoid the agency problem.

There is empirical evidence to support both hypotheses. While some previous studies have supported the efficiency of remuneration contracts and have found a negative market reaction to hard law-regulation, others have supported the inefficiency of such contracts and the rent extraction view. Hitz and Müller-Bloch (2015) and Larcker *et al.* (2011) found a negative market reaction to remuneration regulation, focusing on the German VorstAG[8] regulation of executive compensation and on U.S. market reaction to eight events that increased the likelihood of executive compensation regulation that would limit compensation or introduce "say-on-pay"[9], respectively. However, Cai and Walklin (2011) find that the say-on-pay regulation in the U.S., passed on April 2007, creates value for companies with inefficient compensation but can destroy value for others, supporting both hypothesis.

In sum, two hypothesis are stablished:

H1. Efficient contracting hypothesis: if existing remuneration practices are, on average, value-maximizing, we expect regulation of these practices to decrease shareholder value.

H2. Entrenchment or rent extraction hypothesis: if existing remuneration practices are, on average, characterized by rent extraction, we expect regulation of these practices to increase shareholder value.

The above hypotheses fail to account for the different consequences regulation might have on a bank's value according to its size. The central thesis of the legislative proposals is that corporate governance in large banks can be effective and thus protect against the risk of systemic failure (Avgouleas & Cullen 2014). Thus, regulating remuneration would be positively assessed by investors and have a positive effect on the value of these banks, due to their importance in the effective running of the entire financial system. However, Directive 2010/76/EU does not account for bank size and establishes the same compensation regulation for large and for small banks.

The impact of remuneration regulation on shareholder value may depend on bank size for two reasons: the cost of hard-law regulation compliance and the need for external equity capital. First, compliance with hard-law regulation on corporate governance has costs (Leuz *et al.* 2008[10]). These costs are lower for large firms because, consistent with Aggarwal *et al.* (2010), large firms already exercise more governance practices recommended by Governance Codes than small firms do. Therefore, authors such as Dicks (2012) find that when governance hard-law regulation is enforced, large firms increase their value while the value of small firms is reduced. Because small firms find governance too expensive, they solve the agency problem and prevent manager misbehavior with incentive pay. A hard-law regulation that limits such incentive pay has negative consequences on these firms. Second, the need for external equity capital means that big or faster growing banks benefit more from governance rules. This would be consistent with studies that report a more positive (or at least a less negative) reaction from large firms to SOX (Chhaochharia & Grinstein 2007; Litvak 2007b).

Therefore, our third hypothesis will take into account bank size.

H3. Remuneration hard-law regulation will have different effects on shareholders' value depending on banks size.

In sum, it is an open empirical question whether and to what extent recent compensation regulation impacts on bank shareholder wealth and whether the impact depends on bank size.

3. Data and methodology

3.1. Sample

The empirical analysis in this paper focuses on European Union (EU) countries because they are obliged to transpose into their national legislation the directives issued by the European Commission, specifically, Directive 2010/76/EU.

The initial sample included all listed banks from Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden and United Kingdom. Those banks acquired or bankrupted during the sample period, as well as those without information in SNL and Datastream Databases, were removed from the sample. In addition, to isolate the event of interest from other events that may substantially affect share prices (confounding events), we eliminated banks with significant dividend announcements and dividend payoffs for instance as according to the literature these impact on price (Del Brio *et al.* 2003; Del Brio *et al.* 2010). The final sample included 124 banks covering all banks operating in the EU in 2009 and with daily quotations in 2009 and 2010.

[Table 1 about here]

The banks were classified according to their size in 2010, assessed by their total assets (obtained from the SNL Database), into two groups. Four criteria were used to make the classification considering the different breakpoints included in the regulation or in the criteria applied by different organizations such as the European Central Bank or the Financial Stability Board. The absence of a unified criterion to distinguish large from medium and small banks establishes the importance of analyzing all of them. Size criteria were ordered chronologically.

First, size breakpoint was established at $50 billion (€37 billion[11]) consistent with the US Dodd-Frank Act 2010 definition of systemically-important banks (Berger & Bouwman 2013). This breakpoint is also in keeping with the literature (Berger & Bouwman 2013; Demirguc-Kunt *et al.* 2013).

In terms of this breakpoint, 51 banks were classified as large with a mean size of €488 billion and 73 as small or medium sized banks with a mean size of €10.4 billion. Thus large banks represent 97.03% of total assets

The second criterion considered the denomination of Global Systemically Important Banks (G-SIBs) which are those deemed too-systemically-relevant to fail. The Financial Stability Board (FSB) has been updating the list of G-SIBs in November since 2011. These banks have higher loss absorbency requirements and are subject to higher supervisory expectations for risk management functions, risk governance and internal control. Our sample includes 16 G-SIBs with mean assets of €1,203.7 billion, representing 75.06% of the banking assets in the sample.

Third, we classified banks with total assets of over €100 billion as large, and banks with total assets under €100 billion as medium and small sized. This breakpoint is in keeping with the Liikanen Report (Liikanen 2012), which classifies as large banks those with assets over €100 billion, combining key aspects of the US Dodd-Frank Act 2010 and the Vickers Report (Vickers 2011) implemented in the UK. The Liikanen Report (Liikanen 2012) is considered the first international attempt at structural reform for the European Union since the crisis. It recommends separation within bank holding companies, and between deposit and trading for banks above certain-size thresholds (Vickers & Lagarde 2014). One key recommendation of the Report is the augmentation of existing corporate governance reforms with specific measures to rein in compensation for bank management and staff (Molyneux 2016), which is directly linked to Directive 2010/76/EU. According to this breakpoint, there are 36 large banks in the sample with mean assets of €664.8 billion, representing 93.59% of the banking assets in the sample.

Fourth, the European Central Bank defines the threshold on the basis of total assets of the banking sector, considering as large those banks with assets as a percentage of total consolidated assets of EU banks greater than 0.5% (ECB 2014). According to this criterion 20 banks in the sample are large with mean assets of €1,056.4 billion, representing 82.34% of the banking assets in the sample.

[Table 2 about here]

As shown in table 3, the size of the banks in our sample is not homogeneous and there are considerable differences among EU countries. It can be observed that the value of assets of the so-called old EU member states (EU-15) (Austria, Belgium, Denmark,

Finland, France, Greece, Spain, the Netherlands, Ireland, Luxembourg, Germany, Portugal, Sweden, United Kingdom, and Italy) is much bigger than the value of assets of new EU member states (Cyprus, Czech Republic, Lithuania, Malta, Poland, Slovakia, Hungary, Bulgaria, Rumania) (Pawlowska 2016). The assets of the old EU member states amount to 98.75% of total assets of the sample, whereas the assets of the new EU member states represent only 1.25%. The United Kingdom banking sector has the largest assets of the old EU member state group. Among the new EU member states, Hungary has the largest assets.

[Table 3 about here]

Equity market data for each bank and market indices were retrieved from Datastream.

3.2. Methodology

To measure the market response to the remuneration regulation we used the event study methodology with daily returns. Following Black and Khanna (2007), we measured only an overall reaction to the regulation, and did not assess which of the different parts of the regulation contributed to investor reaction.

In an efficient market, any regulatory change that affects future cash flows, including new regulations or different enforcement of existing regulations, will cause a change in asset prices as soon as the regulatory change is anticipated by the market (Schwert 1981).

According to Binder (1985) regulatory announcements are likely to be anticipated. The outcome of a new regulation is likely to be known ahead of time because of the extensive negotiations between demanders (interest groups) and suppliers (politicians) on the regulation before actual voting. However, the event study methodology has essentially the same power when focusing solely on the formal announcement which seems to be the greatest surprise when examining all formal announcements (Binder 1985).

November 24, 2010 is the core event day for this study, when the European Commission passed Directive 2010/76/EC. This date marks the start date for European members to transpose the Directive into their national regulations, and while the real effects of the regulation implementation will not be observed until time has passed and all the countries

have transposed its content, market values can immediately react to the regulation when it is known and the event study methodology measures this reaction.

3.3. Estimation of abnormal returns

We estimated the market model[12] for each bank over a one-year estimation period (240 trading days) ending 20 trading days prior to the event, in an attempt to keep the model estimation from being influenced by the event itself. Then, we calculated abnormal returns (AR) as the difference between the returns actually obtained and the returns expected according to the market model. These abnormal returns are assumed to reflect the stock market's reaction to the arrival of new information.

Abnormal returns were then cumulated (CAR) over different event windows, the longest being 41 days (20 days before and after the event).

A broad period was set to calculate excess returns to account for possible reactions in share prices before and after the event date. A period before the event was considered given the difficulty of controlling possible filtrations or rumors that could accelerate the market reaction to the passing of the regulation (Díaz *et al.* 2013). Indeed, all the legislative processes that precede the passing of any regulation justify traders reacting in advance of the event. A period after the event was also considered given the requirement of time by investors to accurately evaluate the impact of the regulation on bank performance (Bhagat & Romano 2002a; Black & Khanna 2007; Nguyen *et al.* 2015). However, the longer the event window, the more difficult it is to claim that confounding effects have been controlled. Therefore, the event window should be long enough to capture the significant effects of the event, but short enough to exclude confounding effects (McWilliams & Siegel, 1997).

Therefore, average cumulative abnormal returns (ACAR) across banks were calculated for both long and short event windows ((-20; 20) (-20;0); (-3; 3) (-5; 0) (-3;0) (-1,1) (-2,0)), from 3 to 41-day event windows[13].

The significance of ACARs has been tested using parametric and non-parametric tests. Parametric tests assume that abnormal bank returns have normal distributions, whereas non-parametric tests do not assume that the data have a particular probability distribution. Abnormal returns distributions are usually fat tailed and right skewed. Thus, parametric test reject the null hypothesis (H_0: AR=0) too often when testing for positive abnormal performance and too seldom when testing for negative abnormal performance. When the

assumption of normality of abnormal returns is violated, parametric tests are not well specified and non-parametric tests become more powerful at detecting a false null hypothesis of no abnormal returns (Serra, 2004). Inclusion of non-parametric test provides a check of the robustness of conclusions based on parametric tests (MacKinlay 1997).

For parametric tests, we employed the time series t-test and the cross-sectional t-test (Brown & Warner 1980, 1985). With the aim of correcting the t-test's prediction error we also use tests based on standardized abnormal returns: Patell's Z test (Patell 1976) and the standardized cross-sectional test developed by Boehmer *et al.* (1991) which accounts for event-induced volatility[14].

For non-parametric tests, we used the generalized sign test (Cowan 1992) taking into account the proportional distribution of positive versus negative abnormal performance.

Most studies only use one or two tests to assess statistical significance (Black & Khanna, 2007; Moeninghoff *et al.* 2015; Nguyen *et al.* 2015). The different tests considered in this paper allow us to draw robust conclusions on the influence of remuneration regulation on bank stock prices.

4. Results

Table 4 presents the average cumulative abnormal returns (ACARs) due to the passing of the remuneration Directive as well as the results of the significance tests applied, for large and small banks.

[Table 4 about here]

On the one hand, considering the breakpoint of €37 billion (US Dodd-Frank Act 2010), the results mainly support the idea of the market anticipation of the passing of the Directive, observing a negative and significant reaction in stock prices for large banks that is higher before the event. Twenty-one-day (-20,0), 6-day (-5,0) and 4-day (-3,0) ACARs are -7.1%, -3% and -2.6%, respectively. We observed that shorter event windows such as 3-day (-1,1) or (-2,0) lose significance, while longer event windows, such as the ones mentioned above, are statically significant at a 1% level for all the different tests.

Event windows that consider a time period after the event are either non-significant or significant but with a lower value for the impact on stock returns. The (-20,20) window while significant, presents an ACAR of -9.6%, but -7.1% was already obtained before the

event during the (-20,0) window. The same is observed for window (-3,3) in which -1.6% of ACAR is observed while in window (-3,0) the negative abnormal return was much higher (-2.6%).

The results are consistent with the fact that regulatory events are likely to be anticipated (Binder, 1985) because of the duration of the legislative procedures. On the other hand, small and medium-sized bank ACARs are not significant for the windows analyzed for the size breakpoint of €37 billion.

As Bhagat and Romano (2002a) indicate, the power of the event study methodology improves as the number of firms in the sample increases, as the number of days in the announcement window decreases and as the abnormal return is higher. On the contrary, the power of the event study diminishes as the sample size decreases. Therefore, the probability of detecting abnormal returns increases with the sample size. In our analysis, it is precisely in small samples (large banks) where we detect significant abnormal returns, and therefore, sample size is not problematic for our conclusions[15].

While for the €37 billion and €100 billion sample breakpoint ACARs are negative and significant for large banks, results are not significant in most event windows for small banks with both breakpoints.

When splitting the sample using the €100 billion criteria (Liikanen Report 2012), significant ACARs for large banks are a bit lower than those found when dividing the sample using the €37 billion criteria. However, the results regarding the significance of such ACARs are the same.

When changing the breakpoint to the ECB criteria or the G-SIBs criteria, ACARs remain negative and significant for large banks. Twenty-one-day (-20,0), 6-day (-5,0) and 4-day (-3,0) ACARs are -5.4%, -2.6% and -1.7%, respectively, for large banks using ECB criteria. The ACARs are very similar for the same event windows for large banks using the G-SIBs criteria.

For small and medium-sized banks the results are also negative and significant for windows (-5,0), (-3,0) and (-20, 20). However, most ACARs are concentrated in the shortest window (-3,0) with a value of -1.13% which represent 44.8% of the abnormal returns obtained during the 41 days window (-20,20) for small and medium-sized banks, when using the ECB breakpoint criteria. The ACAR for window (-3,0) is -1.12% and

represents 37.45% of the ACAR in window (-20,20) for small and medium-sized banks, when using the breakpoint of the G-SIBs criteria.

However, although abnormal returns become significant for small and medium sized banks in both criteria, their amount is lower than for large banks. For example, while for large banks the ACAR for window (-5,0) is -2.6% (ECB criteria) and -2.8% (G-SIBs criteria), for small and medium-sized banks the ACAR is half the size (1.4% in both subsamples).

These findings indicate that the remuneration regulation was not perceived as beneficial from a shareholder perspective (consistent with the H1 ´efficient contracting hypothesis`) and was even considered value-decreasing to larger banks (consistent with H3).

The ´efficient contracting hypothesis` considers that contracts are effective in setting incentives for managers to act in the interests of capital providers, and therefore regulation of executive compensation is perceived by the market to impose potentially inefficient contractual arrangements on large banks and decrease shareholder value. However, another interpretation of the negative reaction to the proposed regulation is that the market expected the regulation to be more restrictive and was surprised by the laxness of the regulation (supporting Larcker *et al.* 2011).

5. Conclusion

The results of this paper are of great interest to regulators, economists, practitioners and corporate governance researchers because it measures the impact of regulatory decisions on financial variables, particularly on share prices. Overall, our study complements existing literature on why and how remuneration regulation matters to bank performance and has important policy implications.

Until now, remuneration regulation has applied in the banking industry regardless of bank size. Yet, as the results of this study show, the effect of regulation depends on bank size. Directive 2010/76/EC, which limits variable remuneration and obliges banks to report their remuneration policy regarding employees whose professional activities have an important impact on their risk profile, has been shown to be insufficient to protect shareholders; indeed it has been considered harmful mainly to large banks and this regulation has not increased investor confidence in the EU market. However, the results vary according to the size breakpoints considered for the analysis. This has two main

implications: first, regulation should take into account bank size; and second, there should be a consistent breakpoint to classify large and medium/small banks.

Our results support the conclusions reached in some developed countries, which also found a negative stock reaction to governance regulation (Litvak 2007a; Zhang 2007; Larcker *et al.* 2011) but contradicts the results obtained in emerging markets such as India, where stock reaction to governance regulation is positive (Black & Khanna 2007). It seems that regulation mainly benefits poor governance countries, but has costs for well-governed ones, despite the great financial scandals suffered by specific banks in developed countries. If it cannot be generalized that bank executives have higher payoffs or that their payoffs are more closely linked to short-term returns than in other sectors (DeYoung *et al.* 2013; Gopalan *et al.* 2014), it is not surprising that a regulation focused on such a remuneration structure has negative or no effect on bank shareholder value.

The results also support the hypothesis that remuneration policies in banks before the passing of the Directive in 2010 were, on average, not value-minimizing, and therefore regulation of these practices decreases shareholder value or does not affect value. Also, the need to complement this European Directive, which is required to be transposed into national laws and which is complemented by other Directives or regulations[16], which developed some of the aspects included in Directive 2010/76/EC, can justify the negative abnormal returns in large banks at the time of its approval.

This research is not without limitations. Although this study has shown the importance of size when assessing the effect of hard-law regulation on shareholders' value, the breakpoint to distinguish large banks from small/medium sized ones is not clear. Even, in voluntary Governance Codes, such as the G20/OECD Principles of Corporate Governance (September 2015), although it is reported that corporate governance frameworks should allow for proportionality, in particular with respect to the size of listed companies, it neither stablishes a breakpoint for companies size. Also, the fact that some recent governments consider regulation as a mechanism to retard growth, and that they are considering the repealing of some of the provisions of current regulation[17], show the need to extend this research to other markets and to think over changes in remuneration regulation.

In conclusion, governments should continue working on corporate governance regulation to improve confidence in the financial markets, and considering size as an important

variable. Further research in this field would contribute to a better understanding of how to regulate and the consequences of such regulation.

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Notes

[1] The number of institutions falling within the reach of the Directive is approximately 6.500 credit institutions and investment firms according to the statistics of the European Central Bank (2017).

[2] US Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

[3] Published on 14 December 2010 and entered into force on 15 December 2010.

[4] These categories of staff should include, at least, senior management, risk takers, those who exercise control functions and any employee whose total remuneration, including provisions on discretionary pension benefits, lies within the same remuneration bracket as senior management and risk takers.

[5] If the company fails to comply, the competent authorities of each EU Member State may impose sanctions, both financial or other types.

[6] The Sarbanes-Oxley Act of 2002 was enacted following a series of failures involving various functions designed to protect the interests of the investing public.

[7] Clause 49 requires, among other things, audit committees, a minimum number of independent directors, and CEO/CFO certification of financial statements and internal controls.

[8] "Vorstandsvergütungsangemessenheitsgesetz" adopted in June 2009. As Hitz and Müller (2015, p. 1) summarize, "the VorstAG mandates that compensation be (1) 'customary', (2) reflect management performance (pay for performance), and (3) be tied to long-term performance measures. In addition, the VorstAG includes an array of specific provisions on executive compensation, and the non-binding advisory vote of shareholders on board compensation ('say on pay'). Also, it invokes liability for supervisory board members should they set inappropriate compensation".

[9] Shareholder voting on executive pay is commonly known as say-on-pay.

[10] Leuz *et al.* (2008) finds that many firms cease SEC reporting due to the increased compliance costs after the Sarbanes–Oxley Act.

[11] We considered the exchange rate €/\$ in 2010 (the year the analyzed Directive was passed) to make the conversion.

[12] $R_{it}=\alpha_i+\beta_i R_{mt}+\varepsilon_{it}$ where R_{it} is the rate of return of the share price of bank i on day t, R_{mt} is the rate of return of the market index, considering as such the stock indices of the respective banks' home countries (Moenninghoff *et al.* 2015), α is the intercept term, β is the systemic risk of stock i, and ε_{it} is the error term, with $E(\varepsilon_{it})=0$.

[13] Other event-windows were also analyzed but the conclusions reached remained the same and therefore they are not included in this paper.

[14] If variance of stock returns increases on the event date, the Patell test, using the time series of non-event period data to estimate the variance of the average abnormal returns rejects the null hypothesis too often.

[15] Indeed, different sample sizes have been used in event studies in the management literature (from 2 to 409) as shown by McWilliams and Siegel (1997).

[16] After Directive 2010/76/EC there have been other regulations (Directive 2013/36/UE, Regulation (EU) 575/2013, Delegated Regulation (EU) 604/2014) which developed some of the aspects included in Directive 2010/76/EC.

[17] As announced by Trump administration about the Dodd-Frank Act in February 2017 (The Guardian, 6/7/2017).

Table 1. Initial and final sample. Selection strategy.

| Country | Initial Sample (Listed banks) | Deleted from the sample because: | | | Final Sample |
		Acquired or defunct	Not present in both databases (SNL + Datastream	Banks with confounding events	
Austria	8	0	4	0	4
Belgium	4	0	1	0	3
Bulgaria	4	1	0	0	3
Cyprus	2	0	0	0	2
Czech Republic	2	0	1	0	1
Denmark	26	4	3	0	19
Estonia	1	0	1	0	0
Finland	3	0	2	0	1
France	23	0	8	0	15
Germany	19	0	11	0	8
Greece	9	1	0	0	8
Hungary	2	1	0	0	1
Ireland	3	0	0	0	3
Italy	24	0	8	2	14
Lithuania	2	1	0	0	1
Luxembourg	3	2	0	0	1
Malta	4	0	0	0	4
Netherlands	3	0	1	0	2
Poland	16	2	7	0	7
Portugal	4	0	0	0	4
Romania	3	0	0	0	3
Slovakia	5	0	1	0	4
Spain	10	1	2	1	6
Sweden	10	0	6	0	4
United Kingdom	18	0	12	0	6
Total	**208**	**16**	**65**	**3**	**124**

Table 2. Summary statistics of the size of the EU banking sector (by total assets). Size (total assets (€billion)).

Criteria		Min	Max	Mean	Median	St Dev	N
I (US Dodd-Frank Act 2010)	Large Banks	40.01	1.998.16	488.25	205.77	581.79	51
	Medium and Small Banks	0.22	36.18	10.41	8.16	10.54	73
II (FSB 2011)	G-SIB	385.10	1,998.16	1,203.79	1,187.26	539.77	16
	Non G-SIB	0.22	658.76	59.26	15.64	104.24	108
III (Liikanen Report 2012)	Large Banks	120.74	1.998.16	664.81	408.25	611.87	36
	Medium and Small Banks	0.22	98.55	19.63	10.03	23.82	88
IV (ECB 2014)	Large Banks	320.82	1.998.16	1,056.48	1,030.78	569.66	20
	Medium and Small Banks	0.22	242.04	43.57	14.31	63.22	104
Total		**0.22**	**1,998.16**	**206.94**	**23.15**	**439.77**	**124**

Table 3. Distribution of the sample by country. Summary statistics of the size of the EU banking sector by country (total assets (€billion))

Country	Min	Max	Mean	Median	St Dev	N	G-SIB
Austria	6.24	205.77	89.99	73.97	95.70	4	0
Belgium	74.70	566.74	320.75	320.82	246.02	3	1
Bulgaria	0.38	2.53	1.37	1.21	1.09	3	0
Cyprus	8.24	42.64	25.44	25.44	24.33	2	0
Czech Republic	27.78	27.78	27.78	27.78	.	1	0
Denmark	0.22	431.40	26.85	1.02	98.32	19	0
Finland	36.18	36.18	36.18	36.18	.	1	0
France	7.78	1,998.16	370.55	15.78	655.98	15	3
Germany	0.72	1,905.63	382.21	83.61	665.11	8	2
Greece	4.26	138.64	63.34	62.18	50.48	8	0
Hungary	34.64	34.64	34.64	34.64	.	1	0
Ireland	75.70	167.47	129.46	145.22	47.87	3	0
Italy	0.52	929.49	167.14	46.98	278.64	14	1
Lithuania	0.67	0.67	0.67	0.67	.	1	0
Luxembourg	86.51	86.51	86.51	86.51	.	1	0
Malta	0.57	6.34	3.30	3.15	3.12	4	0
Netherlands	20.33	1,221.67	621.00	621.00	849.48	2	1
Poland	9.36	42.57	21.35	16.19	12.44	7	0
Portugal	3.30	98.55	57.63	64.34	42.48	4	0
Romania	0.71	11.46	5.73	5.01	5.41	3	0
Slovakia	1.25	10.76	5.85	5.69	4.62	4	0
Spain	22.21	1,216.96	333.32	92.15	477.67	6	2
Sweden	190.44	580.84	313.07	240.49	180.07	4	1
United Kingdom	0.22	1,829.97	1,134.79	1,427.23	776.42	6	5
Total	**0.22**	**1,998.16**	**206.94**	**23.15**	**439.77**	**124**	**16**

Table 4. The stock market reaction to remuneration regulation

US Dodd-Frank Act 2010 Criteria Sample Breakpoint = €37 billion (51 large banks and 73 small and medium sized banks)							
Event window	Group	Average CAR (%)	t-test (time series)	t-test (cross-section)	Patell -Z	Boehmer *et al.*	Generalized Sign-Test
(-20,20)	Large Banks	-9.64	-64.832***	-57.468***	-68.371***	-84.102***	-57.364***
	Small/Medium	0.06	0.0351	0.0644	-0.2223	-0.3134	-10.788
(-20,0)	Large Banks	-7.1	-66.756***	-32.532***	-59.178***	-52.744***	-43.349***
	Small/Medium	0.52	0.3933	0.5544	0.2537	0.2751	0.0922
(-3,3)	Large Banks	-1.62	-26.308***	-24.994**	-24.873**	-29.185***	-23.729**
	Small/Medium	0,00	-0.0018	-0.0041	-0.0374	-0.0511	-10.788
(-5,0)	Large Banks	-3.05	-53.708***	-30.881***	-44.537***	-46.571***	-46.152***
	Small/Medium	-0.63	-0.893	-16.769*	-18.600*	-25.812***	-17.813*
(-3,0)	Large Banks	-2.63	-56.658***	-24.669**	-42.857***	-35.993***	-43.349***
	Small/Medium	-0.24	-0.4218	-10.389	-0.6676	-10.665	-0.6104
(-2,0)	Large Banks	-2.64	-65.786***	-17.955*	-37.552***	-19.512*	-20.926**
	Small/Medium	0.01	0.0239	0.0436	0.1676	0.2133	0.0922
(-1,1)	Large Banks	-1.74	-43.158***	-17.688*	-21.421**	-16.244	-15.321
	Small/Medium	0.04	0.0788	0.1532	-0.0224	-0.0294	-0.142
Financial Stability Board 2011 Criteria Sample Breakpoint = G-SIB (16 large banks and 108 small and medium sized banks)							
Event window	Group	Average CAR (%)	t-test (time series)	t-test (cross-section)	Patell -Z	Boehmer *et al.*	Generalized Sign-Test
(-20,20)	Large Banks	-10.27	-43.188***	-57.352***	-43.311***	-72.486***	-38.709***
	Small/Medium	-2.99	-21.622**	-27.368***	-32.141***	-36.798***	-33.362***
(-20,0)	Large Banks	-4.92	-28.939***	-45.293***	-28.559***	-53.104***	-28.703***
	Small/Medium	-2.27	-23.020**	-18.190*	-27.588***	-24.188**	-17.965*
(-3,3)	Large Banks	-2.00	-20.316**	-25.570**	-20.202**	-26.250***	-13.695
	Small/Medium	-0.47	-0.8207	-12.690	-0.9624	-12.149	-19.890**
(-5,0)	Large Banks	-2.79	-30.629***	-64.343***	-32.653***	-77.041***	-38.709***
	Small/Medium	-1.45	-27.508***	-27.045***	-33.329***	-38.085***	-31.437***
(-3,0)	Large Banks	-1.92	-25.799***	-50.044***	-27.462***	-48.941***	-33.706***
	Small/Medium	-1.12	-26.008***	-20.954**	-24.369**	-25.244**	-21.814**
(-2,0)	Large Banks	-1.25	-19.441*	-37.804***	-18.893*	-33.856***	-18.698*
	Small/Medium	-1.06	-28.268***	-14.524	-17.156*	-11.636	-0.6418
(-1,1)	Large Banks	-0.70	-10.893	-19.574*	-0.9991	-15.875	-0.8692
	Small/Medium	-0.69	-18.453*	-13.854	-11.059	-10.227	-0.8343
Liikanen Report 2012 Criteria Sample Breakpoint = 100 €billions (36 large banks and 88 small and medium sized banks)							
Event window	Group	Average CAR (%)	t-test (time series)	t-test (cross-section)	Patell -Z	Boehmer *et al.*	Generalized Sign-Test
(-20,20)	Large Banks	-10.87	-60.098***	-56.077***	-65.322***	-93.064***	-54.458***
	Small/Medium	-1.09	-0.6850	-10.565	-12.295	-15.512	-18.651*
(-20,0)	Large Banks	-6.6	-51.009***	-30.627***	-48.240***	-55.284***	-44.450***
	Small/Medium	-0.99	-0.8700	-0.7949	-11.885	-10.669	-0.3724
(-3,3)	Large Banks	-2.38	-31.811***	-29.452***	-30.215***	-37.707***	-24.436**
	Small/Medium	0.03	0.0531	0.1088	0.0050	0.0066	-12.254

Event window	Group					
(-5,0)	Large Banks	-3.49	-50.486***	-29.753***	-43.864***	-52.277***	-47.786***
	Small/Medium	-0.86	-14.204	-19.505*	-22.790**	-28.074***	-20.783**
(-3,0)	Large Banks	-2.7	-47.856***	-22.819**	-37.532***	-37.061***	-44.450***
	Small/Medium	-0.62	-12.510	-14.101	-14.702	-16.908*	-10.121
(-2,0)	Large Banks	-2.54	-51.889***	-17.196*	-32.387***	-22.501**	-24.436**
	Small/Medium	-0.48	-11.309	-0.7406	-0.6347	-0.4674	0.0540
(-1,1)	Large Banks	-1.93	-39.510***	-16.833*	-21.391**	-17.644*	-17.765*
	Small/Medium	-0.18	-0.4260	-0.4708	-0.2830	-0.3005	-0.1592

European Central Bank 2014 Criteria
Sample Breakpoint = 0.5% assets (20 large banks and 104 small and medium sized banks)

Event window	Group	Average CAR (%)	t-test (time series)	t-test (cross-section)	Patell -Z	Boehmer *et al.*	Generalized Sign-Test
(-20,20)	Large Banks	-11.25	-53.017***	-68.116***	-53.301***	-83.946***	-43.268***
	Small/Medium	-2.52	-17.698*	-22.899**	-26.367***	-31.309***	-30.208***
(-20,0)	Large Banks	-5.4	-35.537***	-45.531***	-34.935***	-52.802***	-34.319***
	Small/Medium	-2.08	-20.455**	-16.183	-23.995**	-21.114**	-14.518
(-3,3)	Large Banks	-1.71	-19.561*	-26.618***	-19.694**	-27.601***	-11.946
	Small/Medium	-0.46	-0.7887	-12.117	-0.9095	-11.305	-20.402**
(-5,0)	Large Banks	-2.62	-32.297***	-47.671***	-33.852***	-54.973***	-34.319***
	Small/Medium	-1.43	-26.343***	-25.958***	-31.927***	-36.794***	-32.169***
(-3,0)	Large Banks	-1.73	-26.078***	-47.971***	-27.260***	-47.616***	-34.319***
	Small/Medium	-1.13	-25.373**	-20.310**	-23.651**	-24.165**	-20.402**
(-2,0)	Large Banks	-1.01	-17.688*	-30.312***	-16.651*	-27.206***	-16.420
	Small/Medium	-1.09	-28.422***	-14.503	-17.591*	-11.751	-0.6673
(-1,1)	Large Banks	-0.48	-0.8378	-14.426	-0.8051	-12.645	-0.7471
	Small/Medium	-0.73	-19.000*	-14.179	-11.658	-10.643	-0.8635

***significant at 1%, **significant at 5% *significant at 10%