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CEO Turnover in Large Banks: Does Tail Risk Matter?

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Abstract

Using a unique international dataset, we show that the CEOs of large banks exhibit an increased probability of forced turnover when their organizations are more exposed to idiosyncratic tail risks. The importance of idiosyncratic tail risk in CEO dismissals is strengthened when there is more competition in the banking industry and when stakeholders have more to lose in the case of distress. Overall, we document that the exposure to idiosyncratic tail risk offers valuable signals to bank boards on the quality of the choices made by CEOs and these signals are different from those provided by accounting and market measures of bank performance and by idiosyncratic volatility. In contrast, systematic tail risk is usually filtered out from the firing decision, only becoming important for forced CEO turnovers in the presence of a major variation in the costs that the exposure to this risk generates for shareholders and the organization.

JEL classification: G21, G28.

Keywords: Tail Risk, CEO Turnover, Bank Governance.

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1. Introduction

It is widely accepted that the CEOs of large banks have incentives to implement business policies that increase their organizations' exposure to risks (Cohen et al., 2014; Ellul and Yerramilli, 2013; Gandhi and Lustig, 2015). These business policies are motivated by the highly levered nature of banks that provides CEOs with risk-taking incentives given the convexity of their stock and option holdings.

While shareholders are not against executives taking risks, because equity is an out-of-the-money call option whose value is increasing with risk (Acharya and Ryan, 2016; Jensen and Meckling, 1976), they do not have a preference for risks that can be particularly detrimental for the survival of the bank (Stulz, 2015). In this respect, the literature sees a bank's growing exposure to tail risks, measuring the possibility of suffering extremely large losses, as a pivotal example of a risk exposure that could be excessive and dangerous for the organization (Cordella and Yeyati, 2003; Ellul and Yerramilli, 2013; Hellmann et al., 2000; Keeley, 1990; Park and Peristiani, 2007). To put it differently, an exposure to tail risks tends to reward shareholders with positive returns in many scenarios, but it also leads to a small probability that extremely large losses materialize and undermine a bank's longer-term survival (Cohen et al., 2014; Ellul and Yerramilli, 2013; Thanassoulis, 2013).

The purpose of this paper is to understand whether increases in tail risk contribute to raising the likelihood of a forced CEO turnover in large banks. To this end, we present the first cross-country study of CEO turnovers in the banking industry based on a sample of 261 large banks selected from 46 countries for the period 2004-2013.

Whether any link exists between tail risk and the likelihood of a CEO turnover in large banks lacks empirical evidence. This is particularly unfortunate given that dismissal is potentially an important mechanism to discipline CEOs by bank boards and reduce the chances that they overly

expose their banks to extreme risks. In fact, dismissal might lead not only to the loss of current employment but also the loss of unvested equity-based compensation (Dahiya and Yermack, 2008) and reduced future career opportunities (Brickley et al., 1999).

Our analysis is guided by conventional theoretical models proposed for non-financial firms where boards employ performance, volatility and other signals to evaluate CEO choices (Bushman et al., 2010; Gibbons and Murphy, 1990; Holmstrom, 1982; Jenter and Kannan, 2015). When these signals indicate bad outcomes for the corporation that are imputable to a lack of CEO ability or a lack of CEO effort in the decision making, they lead to a CEO dismissal by the board. Along these lines, we argue that tail risk conveys different and additional signals, as compared to stock performance and volatility, of possible bad outcomes for the bank that can be related to CEO choices.

To be more precise, an increasing exposure to tail risks, making a bank more vulnerable to events that can lead to extremely large losses and to a financial distress (Ellul and Yerramilli, 2013), signals that the bank might find it more difficult and costly to conduct its business (Stulz, 2015). For instance, increases in tail risks lead to additional costs for shareholders related to the monitoring role of bank creditors and regulators. Both creditors and regulators do not benefit from the upside gains deriving from bank risk-taking while they bear the cost of the downside. It follows that especially in the presence of a growing tail risk exposure, creditors can significantly increase the risk-premium charged on bank debts and reduce the amount of available funds for the bank (Flannery, 2001; Schaeck et al., 2011; Stulz, 2015). At the same time, regulators might more closely monitor banks and offer negative signals on their financial health with the consequence to reduce share prices and further increase borrowing costs (Berger and Davies, 1998; DeYoung et al., 2001; Slovin et al., 1999).

In our study we follow Ellul and Yerramilli (2013) and Van Bekkum (2016) and use *Expected Shortfall* (*ES*) as our primary measure of bank tail risk. *ES* quantifies the downside of bank risk in the form of extremely large negative stock returns. *ES* is, therefore, a particularly appropriate signal that a bank is overly exposed to extreme risks that are detrimental to bank value. Furthermore, following studies that investigate the role of volatility in CEO dismissal in non-financial corporations (Bushman et al., 2010), we build our analysis on the distinction between idiosyncratic and systematic tail risk, with the former being seen as more directly linked to managerial choices.

By focusing on tail risk, our work is related to the stream of research that emphasizes the importance of going beyond the investigations of (average) stock returns and profitability in order to explain forced CEO turnovers in corporations (see, for instance, Brickley, 2003). This type of investigation is the focus of earlier studies on CEO turnovers in the banking industry (see Hubbard and Palia, 1995). Furthermore, our paper extends and complements the analysis conducted on small US community banks by Schaeck et al. (2011) where the authors show that an increase in bank default risk (measured by the accounting Z-score) raises the likelihood of a forced CEO turnover due to the disciplinary role played by shareholders.

Differently from the existing studies, we show the importance of accounting for tail risk in examining the decision to remove a CEO by the boards of large banks. We find a positive relationship between idiosyncratic tail risk and forced (but not voluntary) CEO turnover, while we document that the exposure to systematic tail risk does not generally influence the firing decision. Furthermore, we show that our result is not related to idiosyncratic tail risk capturing a poor performance effect or simply an idiosyncratic volatility effect, as in the model proposed by Bushman et al. (2010), and holds under different empirical settings, including changes in the way we compute bank tail risk.

A key consequence of the above results is that the importance of idiosyncratic tail risk, but not systematic tail risk, for the firing decision should depend on the banking market structure as the possibility that boards infer signals to evaluate CEO choices is argued to be lower in more concentrated (less competitive) industries (DeFond and Park, 1999; Fee et al., 2013; Yonker 2017). This is because CEOs operating in more concentrated industries are less likely to be subject to similar uncertainties (DeFond and Park, 1999), have less peers (Brickley, 2003; Fee et al., 2013; Yonker, 2017), and their outputs are more likely to be influenced by the actions of other CEOs in the same industry (Holmstrom, 1982). Consistent with the view that the market structure influences the ability of the boards to identify unfit CEOs, we find that the sensitivity of forced CEO turnovers to idiosyncratic tail risk is lower in more concentrated banking markets, but this is not the case for systematic tail risk.

We next evaluate which stakeholders amplify the importance of tail risk for forced CEO turnovers. In doing so, we contribute to the literature on how different bank stakeholders react to downside risks in banks (Gandhi and Lustig, 2015). We show that the sensitivity of CEO dismissals to idiosyncratic tail risk increases with a larger presence of subordinated debtholders (namely debtholders that are liable to incur potentially larger losses in the case of a bank distress) or shareholders with lower diversification opportunities. To put it differently, our analysis suggests that idiosyncratic tail risk plays a more important role for the firing decision of large bank CEOs in the presence of stakeholders that have more to lose in the case of distress.

The final part of our analysis looks more closely at a bank's exposure to systematic tail risk. In the case of large banks, there are specific factors that go against the argument that any exposure to systematic tail risk is completely unrelated to managerial choices. In particular, recent banking studies suggest that bank CEOs have incentives to manufacture non-firm-specific tail risks and to engage in systematic risk-taking (modelled as an endogenous choice) to extract value from the

financial safety net (Acharya et al., 2017; Acharya and Yorumazer, 2007; Adrian and Brunnermeier, 2016; Bushman and Williams, 2015; Farhi and Tirole, 2012; Pennacchi, 2006).

To understand how boards perceive systematic tail risk in large banks, we test for the presence of variation in the sensitivity of forced CEO turnover to systematic tail risk when there are changes in the consequences a bank can suffer from being exposed to this risk. By using several alternative empirical settings, we consistently find that the exposure to systematic tail risk becomes more (less) important for CEO dismissal when such exposure is deemed to be more (less) costly for a bank. For instance, we find that the sensitivity of CEO forced turnover to systematic tail risk is significantly larger after a bank is included in the list of global systemically important financial institutions by the Financial Stability Board. For these institutions, regulatory costs are linked to the systemic effects they produce (see Bongini et al., 2015) and the removal from the list occurs only when they no longer pose a global systemic threat. All in all, our tests indicate that the specificities of banks play a crucial role in the way bank boards see the exposure to systematic tail risk.

The rest of the paper is organized as follows. Section 2 discusses why tail risks should matter for forced CEO turnovers in large banks. Section 3 describes the sample, econometric methods and variables. Section 4 examines the impact of a bank's idiosyncratic and systematic tail risk exposure on the likelihood of a CEO turnover, while Section 5 offers conclusions.

2. CEO Turnovers and the Tail Risk Exposure of Large Banks

2.1 Tail Risk as a Signal of Bad Managerial Choice

The existing literature offers little guidance on whether risk, and tail risk in particular, matters for the board decision of large banks to fire a CEO. Studies on non-financial corporations have mostly emphasized the importance of corporate performance for CEO turnover (Brickley, 2003; Chakraborty et al., 2007; Engel et al., 2003; Farell and Whidbee, 2003; Fisman et al., 2014; Guo

and Masulis, 2015; Hazarika et al., 2012; Jenter and Kannan, 2015). An exception is Bushman et al. (2010) who argue that, for a given level of corporate performance, a higher level of idiosyncratic volatility increases the probability of a forced CEO turnover as it signals uncertainty about CEO talent.

Similarly, with the exception of Schaeck et al. (2011), who focus on the importance of accounting default risk for forced CEO turnovers in US community banks, the limited number of studies on banks has only investigated the influence of performance (Hubbard and Palia, 1995) and the role of regulatory scrutiny on the turnover decision (Palvia, 2011; Webb, 2008).

In general, conventional theoretical models of CEO dismissal are built around the idea that boards assess the quality of CEO choices on the basis of performance, volatility and other signals (Bushman et al., 2010; Gibbons and Murphy, 1990; Holmstrom, 1982; Jenter and Kannan, 2015). These signals lead to the dismissal of the CEO when they indicate bad outcomes for the corporation and when these outcomes are due to a lack of CEO ability or CEO effort in the decision making (bad choices). Using this setting as a starting point, we expect that increasing a bank's tail risk amplifies the likelihood of a forced CEO turnover. In other words, we postulate that tail risk offers signals of possible bad outcomes for the corporation that are not contained in measures of performance and volatility and that are the result of CEO (bad) choices.

In respect to the above, the extant literature shows that a bank's exposure to tail risks, measuring the possibility of extremely large losses, is conventionally seen as signalling a risk exposure that may be excessive (Cordella and Yeyati, 2003; Ellul and Yerramilli, 2013; Hellmann et al., 2000; Keeley, 1990; Park and Peristiani, 2007). More precisely, shareholders want the CEO to take risks that are not detrimental to the corporation (Stulz, 2015), while an exposure to tail risks signals that a bank can be subject to extremely negative events that might threaten its survival. Furthermore, a growing exposure to tail risks can also substantially affect the short-term value of

the bank. For instance, this exposure might lead to funding restrictions by creditors (especially if they are not protected by deposit insurance) and increased funding costs (Flannery, 2001; Schaeck et al., 2011; Stulz, 2015).

In addition, and differently from non-financial firms, banks are subject to monitoring by regulators who are concerned with the effects of bank tail risks on financial stability. The consequent growing regulatory scrutiny due to tail risks has the potential to negatively influence shareholder wealth in several ways. Specifically, DeYoung et al. (2001) show that supervisory inspections that convey bad news lead to an increase in the borrowing costs of large commercial banks, while Berger and Davies (1998) and Slovin et al. (1999) find that negative regulatory assessments are associated with a decline in stock prices. Moreover, in the presence of an excessive risk exposure, regulators have the power to prohibit certain bank activities, to dismiss bank managers, and even to close down the bank (De Young et al., 2001; Schaeck et al., 2011).[3]

In summary, an increasing exposure to tail risks amplifies bank distress costs and leads to the probability of losses in bank value caused by the monitoring role of bank creditors and regulators. It follows that a board should consider firing the CEO whenever a growing exposure to tail risks is associated with a lack of CEO ability or CEO effort in terms of risk-management.

2.2 Sources of Tail Risks and Forced CEO Turnovers

Conventional theoretical models on CEO dismissal in non-financial firms highlight also the importance of distinguishing the sources of a firm's risk exposure to understand the drivers of the

[3] In a cross-country setting, the regulatory influence is confirmed by a 2012 WorldBank survey. The survey shows that in the presence of excessively risky policies, regulators might impose costly actions for shareholders such as a stop to dividend payments or the enforcement of a capital restoration plan. Furthermore, around 90% of the national supervisors have the powers to exercise enforcement actions that lead to the removal of bank managers and directors.

firing decision. CEO choices are normally expected to influence the idiosyncratic component, but not the systematic component of risk. Accordingly, any type of systematic risk (including tail risk) should be seen as a manifestation of an exogenous event and as such not relevant to the firing decision (see for instance Eisfeldt and Kuhnen, 2013; Jenter and Kannan, 2015; Kaplan and Minton, 2012, where CEO turnover in non-financial firms is linked to the relative performance evaluation framework). Using a different theoretical setting, Bushman et al. (2010) argue that, differently from idiosyncratic volatility, an increase in systematic volatility reduces the likelihood of a forced turnover as it makes it more problematic for boards to infer indications of CEO talent.

It might be argued, however, that there are some specificities in the case of the tail risk of large banks that go against the argument that any exposure to systematic sources of risk is unrelated to CEO choices.[4] For instance, the presence of implicit and explicit government guarantees within the banking industry can induce bank CEOs to favor business policies that generate systematic tail risks or increase a bank's exposure to systematic tail risks (see Farhi and Tirole, 2012; Pennacchi, 2006). Similarly, Acharya et al. (2010) argue that the global financial crisis of 2007-2009 is primarily

[4] A possible endogeneity is, for instance, recognized within the macro-prudential view of banking regulation that has grown in importance post the global financial crisis (Beatty and Liao, 2014). Under this approach large banks are subject to additional rules and discipline motivated by the potential effects of their risk-taking on overall financial stability and not simply on the stability of individual banks. One example in this direction is Section 121 of the Dodd-Frank Act, approved in July 2010, where the Federal Reserve might prevent mergers and acquisitions, restrict the products a firm is allowed to offer, terminate activities, and sell assets whenever a bank (larger than $50 billion in terms of total assets) poses a "grave threat to the financial stability of the United States." Furthermore, systemically important banks, as identified at the domestic or at the global level, are subject to additional prudential requirements under the macro-prudential regulatory approach proposed by the international capital standards after the crisis and known as Basel III.

the consequence of large and complex financial institutions manufacturing systematic tail risks. In addition, Bushman and Williams (2015) demonstrate that, via their loan loss recognition policy, bank managers generate tail risks that have negative implications for the whole banking industry. Furthermore, Pennacchi (2006) argues that banks are inclined to favor lending and off-balance sheet activities with high exposure to systematic risks, as these business choices increase the value of their deposit insurance subsidy.

Nevertheless, the fact that the banking literature does not see the exposure to systematic tail risk as being entirely unrelated to managerial choices does not necessarily imply that this exposure should matter for bank CEO dismissal. In fact, by increasing the exposure to systematic tail risks, a bank can increase the probability of receiving a government bailout that transfers the bank's losses to taxpayers. This is because these losses materialize in periods when also other banks are in trouble and regulators intend to preserve confidence in the banking industry by avoiding bank failures (Farhi and Tirole, 2012). Similarly, an increasing exposure to systematic tail risks increases the probability of delaying the closure of a bank in distress, as the distress typically occurs in periods when regulators aim to avoid panic (see e.g. Acharya, 2009; Acharya and Yorulmazer, 2007; Bolton et al., 2015; Brown and Dinc, 2011). It follows that the exposure to systematic tail risks may be perceived by bank boards as being less damaging and dangerous for shareholders and the bank than the exposure to idiosyncratic tail risks.

To summarize, the arguments indicating that bank boards should account for bank tail risk in the CEO firing decision are expected to be primarily valid for the idiosyncratic component of this risk. Differently from systematic tail risk, idiosyncratic tail risk is not only more likely to be perceived by a bank board as the result of CEO lack of ability or effort in managing risks but might also be seen as more likely to be detrimental for shareholders and the bank.

3. Data, Econometric and Variables

3.1 Data

The analysis is based on a sample of listed, large commercial banks and bank holding companies with accounting data available from BankScope by Bureau van Dijk and market data available from Datastream International. We select the sampled banks from an initial list that included the top 500 listed large commercial banks and bank holding companies in terms of total assets at the end of 2004, as identified by BankScope. Our sample period is from 2004 to 2013. From this initial list we retain only banks for which we are able to collect governance data (including data on CEOs) from annual and governance reports. We also search for governance information from various relevant databases, such as Bloomberg, Business Week, Forbes and S&P Capital IQ. This reduces the sample size to approximately 300 banks.

As explained in the next section, our empirical model employs lagged explanatory variables to estimate the likelihood of a CEO turnover. Therefore, the first CEO turnover event we record begins in January 2005 and the last turnover occurs in December 2013. This results in an initial sample of 342 turnover events. We then exclude turnovers where a temporary CEO was appointed during a time of transition or turnovers that were associated with mergers occurring over the same period.

Next, we classify the remaining turnovers as forced or voluntary by conducting a manual search of news articles that explain the reason for each outgoing CEO. Our final classification follows Huson et al. (2001) and Parrino (1997).[5] Furthermore, to minimize classification errors, we

[5] We classify a CEO turnover as forced if any of the following conditions are met: a) the announcement reports that the departing CEO was fired or dismissed; b) the outgoing CEO left because of poor performance, had a conflict of opinion with the board, or was under pressure from the board due to accounting scandals; c) the outgoing CEO is under the retirement age of 60 years but does not leave the firm for health reasons or to take up another job outside

conduct additional investigations to validate whether the turnover was voluntary; namely, explaining if it was motivated by retirement, resignation for personal reasons or to pursue a new business, or by the outgoing CEO taking up another post in the same firm or a new job elsewhere. Finally, we remove turnovers where no reliable data could be found for the reason behind the CEO's departure.

After imposing the described selection criteria, our final sample consists of accounting and market data for 1994 observations (261 unique banks chartered in 46 countries) from 2004 to 2012. Our sample size is similar to two recent cross-country studies that focus on the cross-sectional relationship between bank governance and performance during the global financial crisis (see Beltratti and Stulz, 2012; Erkens et al., 2012). The sample of CEO turnovers includes 74 forced turnovers and 198 voluntary turnovers for the period 2005-2013. The proportion of forced turnovers is in line with the figures reported by studies on non-financial firms (Bushman et al., 2010; Jenter and Kannan, 2015).

[Insert Table 1 here]

Panel A of Table 1 reports the sample distribution by country. As in previous cross-country studies (Beltratti and Stulz, 2012; Erkens et al., 2012), a large number of banks are concentrated in Japan and the US, representing 16.75% and 16.80% of the total number of observations, respectively. For the remaining countries, the share in terms of total observations does not exceed 5%. Panel B of Table 1 reports the distribution of turnovers by year and there is no obvious trend in CEO turnovers.

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the firm; d) the turnover resulted from re-organization or re-structuring attempts initiated by the board or the government.

3.2 Econometric Method

In our sample of CEO turnovers, there are two key CEO exit mechanisms; 1) being dismissed, 2) leaving voluntarily. The two types of turnovers are mutually exclusive and compete with each other as potential exit mechanisms for managers in a given bank. Therefore, following Gregory-Smith et al. (2009) and Hazarika et al. (2012) and using the complete data about firms with no CEO turnover, forced turnovers and voluntary turnovers, we adopt a competing risks hazard model to account for the fact that forced turnovers are not the only exit mechanism for CEOs (see the Appendix).

The dependent variable of the model is CEO tenure (defined as the number of years a CEO held his/her chief executive position) and all independent variables are lagged by one year to reduce simultaneity and endogeneity concerns. Under this empirical setting, the impact of each determinant varies for different types of CEO turnover. We describe the covariates used in our empirical analysis in the following sections.

3.3 Measuring Bank Idiosyncratic and Systematic Tail Risk

Following Ellul and Yerramilli (2013) and Van Bekkum (2016) we use *Expected Shortfall* (*ES*) as our primary measure of a bank's tail risk exposure. *ES* quantifies the downside of bank risk in the form of extreme negative stock returns.

We estimate idiosyncratic and systematic *ES* using the historical approach based on realized returns. In general, the historical approach relies on the assumption that the *realized* exposure to extreme risks offers valuable indications on the *expected* exposure to these risks. In line with this view, Acharya et al. (2017) show that measures of extreme bank risk computed before the crisis predicted stock performance during the global crisis. *ES* is a common tool used in bank financial risk management (Acharya et al., 2017; Yamai and Yoshiba, 2005) where the historical approach is widely applied. For instance, Perignon and Smith (2010) show that historical simulation is by far

the most popular estimation method employed by large banks over the period 1996-2005 to quantify their exposure to extreme market risks. This is not entirely surprising given that Bali et al. (2009) show that the historical approach delivers results that are very similar to those obtained through more sophisticated methodologies that may require more restrictive assumptions.

More formally, for bank *i, ES* is the average daily return below the 5th percentile of the yearly distribution (see Ellul and Yerramilli, 2013; Van Bekkum, 2016) and can be expressed as:[6]

$$ES_i^{\alpha} = -E\left[R_{i,t} \middle| R_{i,t} < R_{i,T}^{\alpha}\right] \tag{1}$$

where $R_{i,t}$ is the daily stock return for bank i at day t and $R_{i,T}^{\alpha}$ is a bank's daily stock return equal to the α percentile (equal to the 5th percentile in our analysis) of the T yearly distribution. Conventionally, as shown in (1), to compute *ES* the average of the daily stock returns in the lower tail of the return distribution is multiplied by minus one such that higher values of *ES* indicate a higher bank exposure to extreme negative returns.

However, as our predictions depend on the nature of a bank's tail risk exposure, we need to estimate the idiosyncratic and systematic components of *ES*. To this end, we start by extracting the idiosyncratic component of bank daily stock returns via the residuals of an augmented market model, where daily bank returns are regressed on market returns and industry returns (both based on domestic indexes provided by Datastream) as shown below:[7]

$$R_{i,t} = \beta_1 + \beta_2 R_{m,t} + \beta_3 R_{b,t} + \varepsilon_{j,t} \tag{2}$$

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[6] For instance, with 200 daily stock returns and a 5th percentile equal to -2%, *ES* is the average daily return in the trading days where the daily stock returns are lower than -2%.

[7] As explained in Section 4.2, we also employ alternative specifications of the market model and confirm that the results remain qualitatively unchanged.

where $R_{i,t}$ is the return for stock i at time t, $R_{m,t}$ is the daily return for the market index for each country, $R_{b,t}$ is the daily return for the banking industry index for each country.

We then compute idiosyncratic (systematic) *ES* using the residuals (the predicted values) obtained from equation (2) that captures the time series of idiosyncratic (systematic) returns. As a result, following equation (1), *Idiosyncratic ES* is the average idiosyncratic return below the 5th percentile of the yearly distribution of the residuals $(\hat{\varepsilon}_{j,t})$ from the market model. Whereas *Systematic ES* is the average return below the 5th percentile of the yearly distribution of the predicted returns from the market model $\left(i.e., \hat{\beta}_1 + \hat{\beta}_2 R_{m,t} + \hat{\beta}_3 R_{b,t}\right)$.

In additional tests, we employ an alternative systematic tail risk measure by using the approach proposed by Acharya et al. (2017). Under this approach, a bank's exposure to extreme market-wide events is defined by the *Marginal Expected Shortfall* (*MES*); namely, the expected bank return when the market is under distress conditions:

$$MES_i^{\alpha} = -E\left[R_{i,t} \middle| R_{m,t} < R_{m,T}^{\alpha}\right] \tag{3}$$

where $R_{i,t}$ is the return of bank i at time t, $R_{m,t}$ is the market return at time t and $R_{m,T}^{\alpha}$ is the stock market daily return corresponding to the α (5th) percentile of the yearly distribution of daily market returns. Larger values of *MES* indicate lower bank returns in the presence of an extreme negative market condition.

[Insert Table 2 here]

Panel A of Table 2 reports summary statistics of our tail risk measures for three different groups of banks: banks with no CEO turnovers, banks with at least one forced CEO turnover, and banks with at least one voluntary CEO turnover. The mean idiosyncratic (systematic) *ES* for banks that experienced forced turnovers is 2.25% (3.50%), as compared to 2.06% (2.94%) for banks with no turnovers and the difference is statistically significant. By contrast, the mean (median) idiosyncratic

ES and systematic *ES* for banks with voluntary CEO turnovers are not statistically different from those of banks with no CEO turnovers.

3.4 Bank Stock Performance and Volatility

Previous studies show that CEO dismissals are extreme forms of pay-performance sensitivity, where poor performance leads to a greater likelihood of turnover (Huson et al., 2001; Parrino, 1997). As our tail risk measures are based on the yearly stock return distribution, their impact on dismissal might then simply be the result of a poor performance effect.

In our empirical setting we, therefore, account for stock performance. We construct measures of idiosyncratic and systematic stock returns based on the approach followed by Jenter and Kannan (2015). Specifically, we compute idiosyncratic and systematic stock returns by annualizing daily values of predicted and residual stock returns using equation (2).

Stock return volatility is also an important driver of tail risk. Despite tail risk and volatility being closely related, Rosenberg and Schuermann (2006) demonstrate that they can be affected differently by bank decisions in terms of business mix and by the degree of correlation among different forms of risk exposure.[8] Nevertheless, previous studies show that stock volatility matters for the firing decision in non-financial firms. In particular, Bushman et al. (2010) argue that idiosyncratic volatility is an indicator of uncertainty about CEO talent that matters for the dismissal decision after controlling for bank performance. Accordingly, we also control for a volatility effect

[8] Specifically, for a typical large internationally active bank, Rosenberg and Schuermann (2006) demonstrate that different combinations of market, credit and operational risk exposures lead to a similar degree of bank volatility but different exposures to tail risk. This is because, typically, market risk exposures are characterized by higher volatility but shorter fat-tails in their distribution, while credit risk and operational risk exposures show an opposite pattern.

by including in the model idiosyncratic and systematic volatility components that we compute at a yearly frequency for the residual and predicted returns from equation (2).

While Panel B of Table 2 reports summary statistics for our measures of stock performance and volatility, Panel C shows their (Pearson and Spearman) correlation coefficients with tail risk measures. All tail risk measures show a relatively low degree of correlation with measures of idiosyncratic and systematic performance, whereas they are clearly more correlated with volatility components.[9] In general, the correlation analysis confirms that tail risk and volatility, though correlated, capture different features of a bank's risk exposure.

3.5 Other Controls

Panel A of Table 3 shows the other bank fundamentals that are potential determinants of CEO turnover (see Jenter and Kannan, 2015; Parrino, 1997; Schaeck et al., 2011). We control for accounting performance, based on a bank's ROA, since a short-term profit measure is usually a key predictor of CEO dismissal (Fiordelisi and Ricci, 2014; Parrino, 1997). We also include industry ROA since poor industry performance also results in an increasing CEO dismissal risk (Jenter and Kannan, 2015; Schaeck et al., 2011). We measure bank-specific accounting performance as a bank's ROA minus the mean ROA of the domestic banking sector (*Profitability*) and include the mean ROA (*Industry Profitability*) at the country level to account for general (systematic) industry performance.

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[9] More precisely the Pearson correlation coefficient between idiosyncratic (systematic) ES and idiosyncratic (systematic) returns is -0.34 (-0.37). The Pearson correlation between idiosyncratic (systematic) ES and idiosyncratic (systematic) volatility is instead approximately 0.81 (0.82). Nevertheless, in the online appendix, we show that there is a much lower degree of correlation between alternative measures of idiosyncratic (systematic) tail risk, employed in robustness tests, and idiosyncratic (systematic) volatility.

[Insert Table 3 here]

We control for the size of a bank (*Bank Size*) by the log of total assets (in thousands of US dollars). Larger banks have a bigger pool of talented executives to replace the existing CEO and this should lead to a larger probability of CEO turnover (Chakraborty et al., 2007). We also include bank size squared, as we find evidence of a non-linearity in the relationship between CEO turnovers and size. Next, we control for the capital strength of a bank (*Bank Capital*), measured by the ratio between the book value of equity and the book value of bank assets, and a bank's charter value (*Charter Value*), measured as the sum of the market value of a bank's equity and the total book value of a bank's liabilities all scaled by the book value of a bank's assets. Lower equity capital and charter values (signaling lower growth opportunities) may trigger an increased risk-taking and greater levels of regulatory pressure to replace poorly performing CEOs (Schaeck et al., 2011).

Panel B shows measures of bank internal governance and of external monitoring that can also impact the dismissal risk of CEOs (Laux, 2008; Yermack, 1996). For instance, smaller boards are associated with better performance and a greater threat of CEO dismissal (see, for instance, Yermack, 1996). More independent boards are expected to be more likely to challenge and replace an underperforming CEO (Laux, 2008; Weisbach, 1988), although entrenched CEOs may exert power over the board and reduce the likelihood of termination (Berger et al., 1997; Hermalin and Weisbach, 1998). Accordingly, we control for the log of the number of board members (*Board Size*) and for the degree of board independence (*Independent Directors*) measured by the ratio between independent directors and total board members. We include an index of CEO power (*CEO Power*) based on the sum of two binary variables: a dummy variable equal to one if the CEO was internally promoted and a dummy variable equal to one if the CEO also serves as the chairman of the board. We expect that more powerful CEOs are less likely to be dismissed.

Next, we control for the percentage of shares held by insiders excluding the CEO (*Insider Ownership*). Higher levels of insider ownership result in internalizing the costs of bank default (Booth et al., 2002) and are likely to lead to a greater likelihood of CEO dismissal (Huson et al., 2001). However, higher levels of insider ownership could also lead to entrenchment and reduce the level of monitoring and discipline of CEOs (Denis et al., 1997; Goyal and Park, 2002).

CEO turnovers might also depend on the strength of the risk governance within a bank. Risk committees (and the Chief Risk Officer) evaluate and communicate to the board the impact of managerial policies on the risk-profile of the bank (Ellul and Yerramilli, 2013; Keys et al., 2009). We measure the strength of the risk-management function (*Risk Governance)* as the sum of two binary variables that take a value of one if there is a risk committee and if there is a Chief Risk Officer.

We finally control for two sources of the external monitoring of bank managers. First, we control for the possible influence of bank regulation (Booth et al., 2002; Schaeck et al., 2011) by including the general strength of the supervisory agency (*Supervisory Power*) from Barth et al. (2004) and the subsequent surveys conducted by the World Bank.[10] Second, we control for the percentage of bank stock owned by institutional investors (*Institutional Ownership*). Recent theoretical evidence shows that institutional shareholders can discipline firm management by the threat of exit (Admati and Pfleiderer, 2009; Edmans and Manso, 2011). Furthermore, institutional shareholders are likely to show better skills in assessing CEOs relative to their peers.

[10] In the case of banks, another source of monitoring is the presence of subordinated debt-holders. While we do not control for this in our preferred specification, due to the large number of missing values in our dataset, we conduct additional tests in section 4.5 where this disciplinary channel is explicitly taken into account.

Finally, Panel C reports additional country controls. The first is the concentration of the banking market (*Bank Concentration*) measured as the log transformation of the Herfindahl index of bank deposits in each country. In less concentrated markets, board members can accurately benchmark CEO performance to peers and identify poorly performing executives (Holmstrom, 1982). Consistent with this, DeFond and Park (1999) and Goyal and Park (2002) show that in industries with low levels of concentration there is a higher likelihood of forced CEO turnover. Further, a more concentrated market might result in lower discipline because of the lower number of peers in the external market for executives, with a consequent increase in the difficulty of replacing an incumbent CEO (Fee et al., 2013; Yonker, 2017).

We then include a country-level index from the World Bank database on Doing Business (*Director Liability Index*) that measures the power of shareholders to implicate directors for self-interested behavior. We expect a greater likelihood of CEO turnover in countries where shareholder power is higher. We also control for the degree of regulatory restrictions placed on bank activities (*Activity Restrictions*) from the World Bank regulatory dataset. In countries with a more complex banking business, bank boards could find it more difficult to understand a bank's business model and the related signals for the firing decision.

Next, the GDP per capita (*Development*) accounts for the degree of economic development of a country that might affect the monitoring ability of stakeholders and consequently the probability of forced turnovers. We use the ratio between the fiscal balance and country GDP (*Fiscal Capacity*) to capture the possibility that countries with a larger budget balance are more likely to extend government guarantees to weak banks (Brown and Dinc, 2011). As in Houston et al. (2010), we also control for country size (*Size of Economy*) through the log of domestic GDP in millions of US dollars to account for the fact that a few large economies may be driving our results and for the inflation rate (*Inflation*).

4. Tail Risk and CEO Turnover

4.1 Does a Bank's Tail Risk Exposure Matter?

We begin our empirical analysis by first estimating a baseline specification for the full sample of CEO turnovers with idiosyncratic and systematic *ES* as the key explanatory variables and controlling for bank fundamentals (including stock return and volatility components) and country characteristics. We then extend the baseline specification with the addition of measures of internal and external monitoring mechanisms that might affect the firing decision (column (2)).

[Insert Table 4 here]

The results, reported in Table 4, provide consistent evidence that the hazard rate of a forced CEO turnover is positively associated with idiosyncratic bank tail risk: idiosyncratic *ES* enters all models with a positive coefficient that is significant at customary levels.[11] In contrast, idiosyncratic and systematic *ES* are not significantly associated with the hazard of a voluntary turnover. Hence, a CEO's decision to voluntarily leave a bank does not depend on the bank's exposure to tail risk.

Our results for forced turnovers are also economically significant: a one standard deviation increase in idiosyncratic *ES* leads to an increase in CEO dismissal risk by approximately 61% using the coefficients obtained from model (2).[12] Moreover, all these tests show that systematic tail risk does not influence CEO forced turnover. This conclusion also holds when we follow Acharya et

[11] Our results are not affected by the high correlation between tail risk and volatility components. We achieve similar conclusions when we re-estimate the models without idiosyncratic and systematic volatility as control variables.

[12] The coefficients reported in Table 4 reflect the increase/decrease in the log cause-specific hazards ratio. Therefore, we exponentiate the coefficients and then calculate the economic significance.

al. (2017) and replace our systematic tail risk derived from the augmented market model with *MES*. [13]

A possible concern related to the interpretation of our findings is reverse causality; that is, an increase in the probability of a forced turnover might induce managers to increase idiosyncratic tail risk as an extreme attempt to boost value. While the use of the lagged values of bank tail risk in our empirical setting (to some extent) mitigates reverse causality, the existing literature does not generally show that an increasing risk of dismissal increases the risk appetite of CEOs. In fact, Chakraborty (2007) shows the contrasting result that corporate risk-taking increases when CEOs have a higher job security. Furthermore, in the Online Appendix, similarly to Chakraborty (2007), we first estimate the risk of a CEO dismissal via a survival model and then use it as an explanatory variable of bank idiosyncratic and systematic tail risk. In line with previous studies on non-financial firms, this additional test documents that an increase in CEO dismissal risk is not associated with increases in bank tail risk, including idiosyncratic tail risk.

[13] The impact of idiosyncratic ES on forced CEO turnover does not appear to be related to the estimation method of idiosyncratic tail risk. Additional tests (available on request), show that this result holds when we include in the market model single-period and two-period lags of industry and market returns and when we account for non-synchronous trading patterns using both leads and lags of industry and market returns (Dimson, 1979). In addition, the results remain similar if we use an alternative measure of idiosyncratic tail risk based on an approach that resembles the computation of MES and does not require the estimation of a market model .Essentially, we define idiosyncratic tail risk as a bank's average return below the 5th percentile of the daily return distribution when the market returns are above the 5th percentile of the yearly distribution.

The above test, however, does not rule out another possible interpretation based on Weisbach (1988). He observes that stock returns incorporate the expectations that a CEO will be fired. Accordingly, the returns of a bank managed by a CEO that will be fired are higher than they would be otherwise. The anticipation effect embedded in stock returns also influences tail risk and volatility. In essence, when the market anticipates a forced turnover, a bank's return distribution changes leading to tail risk and volatility being informative on CEO dismissal while stock returns are not (as in our analysis). While in section 4.2, we show that our results remain valid when we employ an accounting based measure of tail risk that, as argued by Weisbach (1988), should be less affected by any anticipation effect, we acknowledge the difficulties in fully ruling out an interpretation based on this effect.

Moving onto the analysis of the control variables, we find that numerous variables have a significant impact on the likelihood of a CEO turnover in large banks. Consistent with Bushman et al. (2010), we find that idiosyncratic volatility increases the likelihood of a forced turnover while it does not affect voluntary turnovers. Furthermore, CEOs at large banks are more likely to experience forced turnovers. Moreover, in most of the specifications, CEOs at banks with higher capital ratios are less likely to be fired or to voluntarily leave a bank while higher charter values (signaling more growth opportunities) tend to reduce the probability of CEO dismissal. The likelihood of a forced turnover, but not of a voluntary turnover, is also lower in banks with a higher profitability.

In terms of bank governance, as in the literature on non-financial firms (Del Guercio et al., 2008; Guo and Masulis, 2015; Helwege et al., 2012; Parrino et al., 2003), we find that an increase in CEO power reduces the likelihood of both forced and voluntary turnovers, while higher levels of institutional ownership are more (less) likely to lead to a CEO being fired (leaving voluntarily). As far as country controls are concerned, similarly to DeFond and Park (1999) and Goyal and Park

(2002) for non-financial firms, in most of the specifications we find that the likelihood of a forced turnover is negatively associated with the degree of banking market concentration. Finally, forced turnovers occur more frequently in more shareholder-oriented countries as indicated by higher values of the director liability index.

In general, the results of this section suggest that idiosyncratic tail risk is a key determinant of the likelihood of a forced CEO turnover and offers incremental information as compared to what is contained in accounting and market measures of performance and, more importantly, in idiosyncratic volatility.

4.2 Is the Idiosyncratic Tail Risk Effect Different from a Poor Idiosyncratic Performance Effect?

A possible explanation for our finding still remains that our measures of idiosyncratic *ES* (based on extreme negative returns) are to some extent capturing an effect due to low idiosyncratic stock returns. We conduct a series of tests to further demonstrate that idiosyncratic tail risk has an effect on forced CEO turnover independently from realized idiosyncratic stock performance.

Specifically, we start by focusing on a sub-sample of banks that excludes low idiosyncratic returns (based on the sample median) and re-estimate the competing risks hazard model for this sub-sample. As shown in columns (1) and (2) of Table 5, we still find that idiosyncratic tail risk is associated (at the 10% level) with a greater hazard of CEO dismissal, while systematic tail risk does not matter for CEO dismissals. Therefore, the impact of idiosyncratic tail risk on forced turnover is also observable when we exclude poorly performing banks.

We next construct a sub-sample of banks that jointly exclude those institutions with (simultaneously) low idiosyncratic performance (below the sample median) and high idiosyncratic volatility (above the sample median) to control for the possibility that our finding above is motivated by a high volatility effect. Again, we still find that idiosyncratic tail risk is significant (at the 10% level) in our model.

[Insert Table 5 here]

As a further robustness check, we repeat our analysis by using two alternative extreme risk measures that, as shown in the Online Appendix, have a much lower correlation with measures of realized idiosyncratic stock performance (and volatility).[14] We start by following Bushman and Williams (2015) that employ *Skewness* as an alternative market-based measure of extreme risk. Next, we employ a risk measure focusing on extreme accounting returns (*Accounting Downside Risk*). This measure is computed as a dummy variable that takes a value of one if a bank's ROA is below the 5th percentile of the estimated earnings distribution that we assume follows a normal distribution and we build on the basis of a seven year rolling window of accounting returns starting from 2000. Consistent with our main analysis, we then compute the firm-specific (idiosyncratic) and non-firm-specific (systematic) risk measures. We still find that the impact on forced CEO turnover is limited to the firm-specific component of tail risk. [15]

4.3 Alternative Model Specifications

We conduct various additional tests to check the robustness of our key findings. We report the results of these additional tests in the Online Appendix. We first address the concern that our results may be sensitive to using a competing risks hazard model. We, therefore, estimate a multinomial logit model that is commonly employed by the prior literature on the determinants of

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[14] The Online Appendix also shows how we compute these measures, the related descriptive statistics and the correlation coefficients for idiosyncratic and systematic *ES* and these additional tail risk measures.

[15] The literature (see, for instance, Van Bekkum, 2016) often employs directly the negative value of the stock return corresponding to the 5th percentile of the distribution of daily stock returns (defined as a bank's *VaR*) as a measure of tail risk. In the Online Appendix, we show that our key results remain unchanged also when *VaR* is used as a tail risk measure.

executive turnovers (Huson et al., 2001). Second, we use a simple Cox hazard model whereby we focus only on forced CEO turnovers and treat all voluntary turnovers as censored observations, as in Brookman and Thistle (2009) and Jenter and Kannan (2015). The results of these tests confirm that our primary findings still hold.

Next, we stipulate that a CEO should be in charge for at least two consecutive years before experiencing a turnover event. Hence, we exclude all observations where CEO turnovers took place less than two years after a new CEO was appointed. Again, we do not find any change in our findings.

In our sample period numerous countries experienced a systemic crisis as identified by Laeven and Valencia (2013). It is often argued that CEO dismissals during crises may be a response by boards to increasing public vitriol and regulatory scrutiny into holding executives responsible for mismanagement.[16] To control for the influence of systemic banking crises on our results, we include a dummy (*Crisis*) variable that takes the value of one for every year-country combination identifying a systemic banking crisis. Our primary findings remain similar as regards the positive impact of idiosyncratic tail risk on the likelihood of CEO dismissals.

4.4 Does the Importance of Idiosyncratic Tail Risk on Forced Turnovers depend on the Banking Market Structure?

Our results are consistent with the view that a bank board learns about the CEO's decision making via the exposure to idiosyncratic tail risk. A key implication deriving from such a result is

[16] See for example, 'Bank chiefs in the firing line', The Independent, 30 Oct 2007; 'Royal Bank of Scotland chiefs to be forced out under bailout deal', The Telegraph, 8 Oct 2008; '5% Of Latest Bank Of America Bailout Used To Pay Merrill Lynch Bonuses (BAC)', Business Insider, 22 Jan 2009; 'US watchdog calls for bank executives to be sacked', The Guardian, 5 April 2009.

that the importance assigned to idiosyncratic tail risk should depend on the market structure within which the bank operates.

Specifically, previous studies on non-financial firms postulate that the importance assigned to signals related to CEO choices becomes lower when the industry concentration is higher (Brickley, 2003; DeFond and Park, 1999; Goyal and Park, 2002) as the assessment of CEO decision making is better facilitated in competitive environments. Furthermore, more concentrated markets tend to be characterized by greater difficulties in replacing an incumbent CEO because of the lower number of peers in the external market for executives (Brickley, 2003; Fee et al., 2013; Yonker, 2017).

While the existing empirical evidence focuses on the interplay between performance and market structure, a similar argument should hold in the context of our analysis to the extent that idiosyncratic tail risk offers additional and valuable information to bank boards in the assessment of CEOs' decisions. In this section, we test this conjecture by extending our baseline specification with interaction terms between idiosyncratic and systematic *ES* and our measure of banking market concentration.

[Insert Table 6 here]

The results reported in Table 6 show that the coefficient of *Idiosyncratic ES * Bank Concentration* is negative and statistically significant. This indicates that in more concentrated banking markets, large banks are less likely to dismiss CEOs when idiosyncratic tail risk increases. The results also appear economically relevant: an increase in the degree of bank concentration from the lowest quartile (i.e. countries with low concentration) to the highest quartile (i.e. countries with high concentration) leads to a reduction in the sensitivity of forced turnovers to idiosyncratic tail risk by 54% for a one standard deviation increase in idiosyncratic tail risk for model (1). Furthermore, as shown in the Online Appendix, we achieve a similar result when we employ the market share

in the deposit market of the top four largest banks in a given country as an alternative measure of banking market concentration.

Overall, in line with the prior evidence that indicates concentration reduces the sensitivity of forced CEO turnovers to relative performance in non-financial firms (DeFond and Park, 1999; Goyal and Park, 2002), we show that in the case of the banking industry, market concentration also reduces the sensitivity of CEO dismissals to idiosyncratic tail risk.

4.5 Which Bank Stakeholders Care More about Idiosyncratic Tail Risk?

In this section we evaluate which bank stakeholders amplify the sensitivity of CEO turnovers to idiosyncratic tail risk. This is important to enriching our understanding of which types of stakeholders contribute to increasing the cost of idiosyncratic tail risk for bank CEOs. We look at the role played by bank uninsured creditors, inside shareholders, regulators and institutional investors. To capture the influence of uninsured creditors, we focus on subordinated debtholders since they are subject to a larger risk of suffering losses than other bank creditors and are a key source of discipline for bank executives (Ashcraft, 2008; Goyal, 2005; Nier and Baumann, 2006).

Insiders might have a lower tolerance for idiosyncratic tail risk since they have limited diversification opportunities (Gao, 2010). Consequently, a higher level of insider ownership might result in internalizing the costs of a bank default (Booth et al., 2002) and lead to a decline in the expected utility of pursuing risky policies (Faccio et al., 2011). In short, bank insiders might fear the costs associated with idiosyncratic tail risk more than other types of bank shareholders.

Under the micro-prudential view of banking regulation, an effective regulatory regime should materialize via a larger sensitivity of CEO turnover to idiosyncratic tail risk when the degree of supervisory power increases. More controversial, is the possible role of institutional investors. While they might have better skills in monitoring bank management than other shareholders, the

fact that institutional investors usually hold diversified portfolios might reduce the importance assigned to idiosyncratic tail risk when assessing CEO performance.

[Insert Table 7 here]

To conduct the empirical tests, we estimate models with interaction terms between the selected variables and tail risk measures. The results, reported in Table 7, offer evidence to support the view that some types of bank stakeholders might be more important than others in exercising discipline in terms of idiosyncratic tail risk. Specifically, an increase in the share of subordinated debt in a bank's capital structure or in inside ownership amplifies the sensitivity of CEO turnover to idiosyncratic tail risk but this sensitivity does not vary with the strength of supervisory power or the importance of institutional shareholders.

Overall, the results discussed in this section are not surprising when compared to US-based studies on non-financial firms (Del Guercio et al., 2008; Guo and Masulis, 2015; Kaplan et al., 2012; Parrino et al., 2003). Nevertheless, it is worth noting that the cross-country heterogeneity in bank governance structures in our sample should impose a note of caution when drawing conclusions from the reported findings.

4.6 Do Bank Boards See Systematic Tail Risk as Fully Unrelated to CEO Choices?

We next evaluate whether bank boards interpret systematic tail risk as simply being the manifestation of an exogenous event and as such unimportant for the firing decision. This additional analysis is motivated by a growing body of banking research showing that systematic tail risks are not necessarily exogenous to bank behavior (see, for instance, Acharya et al., 2010; Farhi and Tirole, 2012; Pennacchi, 2006).

Our approach is to test for the presence of variation in the sensitivity of forced CEO turnover to systematic tail risk when there are changes in the consequences a bank can suffer from being

exposed to such risks. A variation in the sensitivity of forced turnover to systematic tail risks in the presence of these changes would suggest that boards perceive the exposure to systematic tail risk as being related, at least in part, to CEO choices.

To conduct this additional analysis, we consider three different settings. The first two settings identify contexts where shareholders might see being exposed to systematic tail risk as more costly. We start by focusing on the period post 2010 when there was greater regulatory and policy attention to systemic matters related to large financial institutions However, it can be argued that the post 2010 environment also witnessed other broader economic changes that may result in a weaker identification. In an attempt to provide a more refined test, we next focus on the institutions in our sample included in the list of global systemically important financial institutions by the Financial Stability Board since 2010. For these institutions regulatory costs are closely related to systemic effects. The inclusion in this list is seen negatively by shareholders (see Bongini et al., 2015) and banks can be removed only when they do not pose a global systemic threat.

Accordingly, our expectation is that if CEO choices are seen as influencing a bank's exposure to systematic tail risk, we should observe an increase in the sensitivity of CEO turnover to systematic tail risk post-2010 and, more importantly, for banks that are identified as globally systemically important. To conduct our analysis, we first interact our measures of tail risk with a dummy equal to one for the years after 2010. Next, we repeat a similar test using a dummy (SIFI) equal to one for global systemically important financial institutions.

In a third test, we use the cross-country variation in the adoption of blanket guarantees by governments on banks debts. Under a blanket guarantee, a government offers protection against a bank default to creditors that are not conventionally protected by deposit insurance. The purpose is to prevent negative externalities arising from correlated bank defaults (Laeven and Valencia, 2012). Under a blanket guarantee, the mispricing of government guarantees is more pronounced

and banks have more possibilities to extract value from the financial safety net via their risk-taking. To extract value, however, banks have to avoid closure by regulators and, thereby, benefit from forbearance (Allen and Saunders, 1993; Ronn and Verma, 1986). This is more likely when banks increase their exposure to non-firm-specific risks (Acharya and Yorulmazer, 2007; Brown and Dinç, 2011). In the presence of a blanket guarantee, we should, therefore, observe a decrease in the sensitivity of a forced CEO turnover to systematic tail risk if CEO choices can influence the exposure to this risk. To conduct this third test, we employ a dummy (*Blanket Guarantee*) that equals one for the time period over which bank liabilities in each country were insured.[17] We then include this dummy and its interaction with the tail risk measures as additional explanatory variables in our models.

[Insert Table 8 here]

Panels A and B of Table 8 show the key findings of the first and the second tests, while Panel C reports the results of the third test. In general, the results of all tests do not support the view that bank boards see the exposure to systematic tail risk as being fully unrelated to CEO choices.[18] The interaction terms between our measures of systematic tail risk and the post 2010 or the SIFI

[17] In our sample 15 countries used blanket guarantees. Data on blanket guarantees are from Laeven and Valencia (2012) and IADI (2005, 2008). We complement these data sources with data from national deposit insurance funds. There is considerable heterogeneity in terms of the time-period over which such guarantees were extended. For instance, various countries (e.g. Malaysia, Taiwan, Thailand and Turkey) extended blanket guarantees during 2004-05. Similarly, some countries (e.g. Australia, Hungary, and Portugal) extended the support beyond the 2007-2009 crisis to cover 2010 and 2011.

[18] The post-2010 coefficient is subsumed in year dummies and hence is not reported in the table.

dummy (the blanket guarantee dummy) are positive (negative) and statistically significant at customary levels.[19]

In summary, the findings discussed in this section suggest that bank boards assign importance to systematic tail risk for forced CEO turnovers when there is a major variation in the costs that the exposure to this risk generates for shareholders and the bank.

5. Conclusions

Our analysis shows that the likelihood of a forced CEO turnover (but not of a voluntary turnover) is greater when large banks are characterized by an increasing exposure to idiosyncratic tail risk. Thus, large bank CEOs do seem to bear some costs of increasing the idiosyncratic tail risk of their banks. Furthermore, the influence of idiosyncratic tail risk is stronger in less concentrated banking industries and in the presence of stakeholders that have more to lose from an increase in this risk. In general, we document that idiosyncratic tail risk offers information to assess CEOs' decision making that is different from what bank boards can infer from accounting and market measures of performance and idiosyncratic volatility.

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[19] An alternative explanation of our finding on blanket guarantees could be panic. Blanket guarantees are often associated with systemic crises where regulators might provide incentives to banks to retain CEOs to avoid exacerbating panic conditions in the system. In the Online Appendix, we test this alternative explanation in two ways. First, we construct an alternative blanket guarantee dummy that takes a value equal to one only when the guarantee covers bank debt in non-systemic crisis periods. Second, we interact the idiosyncratic and systematic tail risk with the crisis dummy employed in Section 4.3 that should signal more panic stemming from the news of a CEO removal. The first test confirms a decline in the sensitivity of forced CEO turnover to systematic tail risk. The second test does not show any impact of our proxy of bank panic on the sensitivity of CEO turnover to systematic tail risk.

Finally, we show that the lack of importance of systematic tail risk that we observe over the full sample period for CEO dismissal does not imply that bank boards consider this risk as always being the result of exogenous events that are completely independent from CEO choices. Our analysis documents that how bank boards see the exposure to systematic tail risk, and the role of this risk in the firing decision, depends on the benefits and costs that such exposure might generate for the bank.

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Table 1
Sample Distribution.

	Observations		Banks	
	Number	**Percentage**	**Number**	**Percentage**
Panel A: Sample Distribution by Country				
Australia	40	2.01	5	1.92
Austria	31	1.55	4	1.53
Bahrain	9	0.45	1	0.38
Belgium	22	1.10	3	1.15
Brazil	17	0.85	2	0.77
Canada	57	2.86	7	2.68
Chile	14	0.70	2	0.77
China	73	3.66	11	4.21
Cyprus	7	0.35	1	0.38
Czech Republic	9	0.45	1	0.38
Denmark	25	1.25	3	1.15
Finland	9	0.45	1	0.38
France	34	1.71	4	1.53
Germany	56	2.81	7	2.68
Greece	49	2.46	6	2.30
Hong Kong	27	1.35	3	1.15
Hungary	9	0.45	1	0.38
Iceland	2	0.10	1	0.38
India	56	2.81	8	3.07
Indonesia	27	1.35	3	1.15
Ireland	23	1.15	3	1.15
Israel	31	1.55	4	1.53
Italy	53	2.66	6	2.30
Japan	334	16.75	47	18.01
Jordan	7	0.35	1	0.38
Korea	39	1.96	6	2.30
Luxembourg	9	0.45	1	0.38
Malaysia	53	2.66	6	2.30
Mexico	18	0.90	2	0.77
Netherlands	18	1.00	3	1.15
Norway	20	0.45	1	0.38
Poland	17	0.85	2	0.77
Portugal	27	1.35	3	1.15
Russia	6	0.30	1	0.38
Saudi Arabia	26	1.30	5	1.92
Singapore	27	1.35	3	1.15
South Africa	44	2.21	5	1.92
Spain	48	2.41	6	2.30
Sweden	27	1.35	3	1.15
Switzerland	30	1.50	4	1.53
Taiwan	85	4.26	12	4.60
Thailand	51	2.56	6	2.30
Turkey	34	1.71	5	1.92
UAE	9	0.45	1	0.38
United Kingdom	59	2.96	8	3.07
United States	335	16.80	43	16.48
Total	**1994**	**100%**	**261**	**100%**

Panel B: Sample Distribution by Year

Year	**Observations**	**Turnovers**		**Forced Turnovers**	
		Number	**Percentage**	**Number**	**Percentage**
2005	186	24	8.82	7	9.46
2006	207	22	8.09	4	5.40
2007	220	27	9.93	6	8.11
2008	236	28	10.29	13	17.57
2009	239	44	16.18	11	14.86
2010	241	35	12.87	7	9.46
2011	228	25	9.19	4	5.41
2012	216	29	10.66	10	13.51
2013	221	38	13.97	12	16.22
Total	**1994**	**272**	**100%**	**74**	**100%**

This Table presents the distribution of our sample of 261 banks across 46 countries from 2005-2013. Panel A presents the sample by country and Panel B by year.

Table 2

Descriptive Statistics and Correlation Matrix: Tail Risk, Return and Volatility Measures.

	No Turnovers				Forced Turnovers						
	N	**Mean**	**Median**	**Std. Dev.**	**N**	**Mean**	**Median**	**Std. Dev.**	**t-stat**	**z-stat**	**N**
		(1)	(2)	(3)		(4)	(5)	(6)	(4) – (1)	(5) – (2)	
Panel A: Tail Risk Measures											
Idiosyncratic ES	1722	2.062	2.185	0.616	74	2.253	2.463	0.576	2.775***	2.877***	198
Systematic ES	1722	2.944	3.060	1.006	74	3.503	3.928	0.842	5.545***	5.033***	198
Marginal Expected Shortfall (MES)	1722	3.576	3.002	2.229	74	4.790	4.040	2.471	4.124***	4.434***	198
Panel B: Return and Volatility Measures											
Idiosyncratic Returns	1722	-0.045	-0.039	0.166	74	-0.106	-0.089	0.202	-2.594**	-2.590**	198
Systematic Returns	1722	0.135	0.130	0.315	74	0.061	0.079	0.350	-1.775*	-1.559	198
Idiosyncratic Volatility	1722	0.205	0.189	0.091	74	0.245	0.224	0.104	3.272***	3.295***	198
Systematic Volatility	1722	0.256	0.234	0.106	74	0.294	0.276	0.111	2.864***	2.996***	198

Panel C: Correlation	(1)	(2)	(3)	(4)	(5)
(1) Idiosyncratic ES	1	0.405	0.422	0.894	0.489
(2) Systematic ES	0.350	1	0.960	0.414	0.834
(3) MES	0.374	0.963	1	0.427	0.825
(4) Idiosyncratic Return	-0.337	-0.086	-0.091	1	-0.172
(5) Systematic Return	-0.110	-0.366	-0.353	-0.199	1
(6) Idiosyncratic Volatility	0.805	0.522	0.503	-0.415	-0.166
(7) Systematic Volatility	0.434	0.815	0.830	-0.140	-0.297

Panel A presents the descriptive statistics of tail risk measures while Panel B shows summary statistics for return and volatility. All variables are defined in Table A1 provided in the Appendix. Panel C provides and return measures. We represent descriptive statistics for our original sample consisting of 1994 observations. The t-statistics provided here are obtained using tests of differences in means and the z-statistics rank-sum test. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 3
Descriptive Statistics: Bank Fundamentals, Governance and Country Characteristics.

	No Turnovers				Forced Turnovers							
	N	**Mean**	**Median**	**Std. Dev.**	**N**	**Mean**	**Median**	**Std. Dev.**	**t-stat**	**z-stat**	**N**	**Mea**
		(1)	(2)	(3)		(4)	(5)	(6)	(4) – (1)	(5) – (2)		(7)
Panel A: Bank Fundamentals												
Profitability	1722	-0.110	-0.004	0.782	74	-0.505	-0.458	0.902	-3.708***	-4.182***	198	-0.20
Industry Profitability	1722	0.009	0.009	0.009	74	0.009	0.006	0.009	-0.690	-0.541	198	0.01
Bank Size	1722	18.362	18.070	1.286	74	19.131	19.056	1.503	4.335***	4.390***	198	18.34
Bank Capital	1722	7.117	6.547	2.625	72	5.912	5.609	2.510	-3.984***	-3.988***	198	7.00
Charter Value	1722	1.026	1.013	0.055	74	1.004	1.002	0.035	-5.056***	-2.984***	198	1.02
Panel B: Governance Characteristics												
Board Size	1722	2.537	2.565	0.334	74	2.550	2.565	0.384	0.296	0.549	198	2.52
Independent Directors	1722	0.477	0.500	0.293	74	0.564	0.542	0.225	3.204***	2.401**	198	0.46
CEO Power	1719	1.119	1.000	0.635	74	0.851	1.000	0.589	-3.815***	-3.557***	197	1.03
Insider Ownership	1581	30.162	22.995	27.688	68	33.001	28.414	31.754	0.725	0.107	186	36.81
Risk Governance	1722	1.447	2.000	0.732	74	1.676	2.000	0.552	3.444***	2.496**	198	1.46
Supervisory Power	1672	11.175	12.000	1.873	73	10.712	11.000	2.038	-1.906*	-1.882*	192	11.17
Institutional Ownership	1660	31.256	24.880	23.010	69	33.027	28.930	22.790	0.631	0.737	191	26.63
Panel C: Country Characteristics												
Bank Concentration	1722	-2.582	-2.717	0.702	74	-2.466	-2.436	0.741	1.321	1.307	198	-2.54
Director Liability Index	1722	6.020	6.000	2.268	74	5.838	5.000	2.021	-0.754	-0.885	198	5.68
Activity Restrictions	1722	11.904	13.000	3.302	74	11.095	11.000	3.150	-2.160**	-2.882**	198	11.96
Development	1722	35.153	35.455	19.732	74	37.622	44.195	20.851	0.999	1.093	198	31.53
Fiscal Capacity	1722	-3.720	-3.586	4.058	74	-3.600	-3.021	3.870	0.260	0.607	198	-3.99
Size of Economy	1722	14.264	14.348	1.572	74	13.985	13.974	1.338	-1.743*	-1.764*	198	14.11
Inflation	1722	2.454	2.200	2.384	74	2.954	2.650	2.392	1.762*	2.240**	198	2.72

This Table presents the descriptive statistics of all other variables which have been defined in Table A1 provided in the Appendix. The t-statistics provided here are obtained using tests of differences in means using the Wilcoxon rank-sum test. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 4
CEO Turnover and Expected Shortfall (*ES*): Idiosyncratic and Systematic ES.

	(1)		(2)		(3)	
	Forced	**Voluntary**	**Forced**	**Voluntary**	**Forced**	**Voluntary**
Idiosyncratic *ES*	0.785***	0.080	0.684**	-0.133	0.688**	-0.173
	(2.915)	(0.286)	(2.408)	(-0.376)	(2.148)	(-0.470)
Systematic *ES*	0.029	0.101	0.019	0.099		
	(0.263)	(1.548)	(0.129)	(1.145)		
MES					-0.025	0.071
					(-0.167)	(0.795)
Idiosyncratic Returns	0.695	0.257	-0.570	0.797	-0.555	0.860
	(0.565)	(0.229)	(-0.372)	(0.661)	(-0.368)	(0.718)
Systematic Returns	-0.622	0.107	-0.881	0.271	-0.898*	0.221
	(-1.458)	(0.428)	(-1.541)	(0.800)	(-1.720)	(0.699)
Idiosyncratic Volatility	6.008***	-1.340	5.087**	-0.365	5.318**	0.083
	(3.327)	(-0.581)	(1.960)	(-0.142)	(2.101)	(0.031)
Systematic Volatility	-1.287	-4.191**	-0.731	-3.316	0.024	-2.728
	(-0.428)	(-2.239)	(-0.192)	(-1.284)	(0.006)	(-1.132)
Profitability	-0.725***	-0.210	-0.534***	-0.193	-0.537***	-0.203
	(-3.076)	(-1.288)	(-2.947)	(-0.983)	(-3.052)	(-1.013)
Industry Profitability	-0.431**	-0.044	-0.292*	-0.018	-0.293*	-0.026
	(-2.522)	(-0.216)	(-1.662)	(-0.074)	(-1.691)	(-0.108)
Bank Size	0.760***	0.022	0.571***	0.105	0.580***	0.118
	(4.846)	(0.150)	(5.277)	(0.785)	(4.842)	(0.880)
Bank Size^2	0.089	-0.080*	0.144**	-0.125***	0.146**	-0.124***
	(1.182)	(-1.744)	(2.254)	(-2.937)	(2.308)	(-2.890)
Bank Capital	-0.111	-0.099*	-0.158**	-0.101*	-0.157**	-0.098
	(-1.538)	(-1.770)	(-2.072)	(-1.666)	(-2.034)	(-1.625)
Charter Value	-5.111	0.866	-5.131*	-1.185	-5.264*	-1.334
	(-1.613)	(0.295)	(-1.829)	(-0.374)	(-1.814)	(-0.412)
Board Size			-0.498	-0.573*	-0.507	-0.586*
			(-1.628)	(-1.757)	(-1.583)	(-1.798)
Independent Directors			0.794	0.697	0.834	0.695
			(0.824)	(1.081)	(0.829)	(1.077)
CEO Power			-0.785***	-0.590**	-0.788***	-0.591**
			(-4.257)	(-2.316)	(-4.265)	(-2.333)
Insider Ownership			0.005	0.006	0.005	0.006
			(0.999)	(1.224)	(0.927)	(1.202)
Risk Governance			-0.288	-0.006	-0.282	0.004
			(-1.301)	(-0.043)	(-1.298)	(0.024)
Supervisory Power			0.103	0.075	0.101	0.075
			(0.879)	(1.089)	(0.877)	(1.084)
Institutional Ownership			0.012**	-0.014**	0.012***	-0.013*
			(2.430)	(-1.971)	(2.582)	(-1.937)
Bank Concentration	-0.392	0.024	-0.585*	-0.120	-0.602*	-0.132
	(-1.306)	(0.111)	(-1.741)	(-0.539)	(-1.878)	(-0.576)
Director Liability Index	0.188***	-0.111**	0.183**	-0.048	0.186**	-0.043
	(3.328)	(-2.509)	(2.134)	(-0.978)	(2.207)	(-0.869)
Activity Restrictions	0.075	-0.016	0.040	-0.001	0.040	0.001
	(1.595)	(-0.496)	(0.821)	(-0.010)	(0.855)	(0.013)
Development	0.004	-0.018**	0.005	-0.025**	0.005	-0.024**
	(0.335)	(-2.014)	(0.392)	(-2.291)	(0.463)	(-2.243)
Fiscal Capacity	0.002	-0.058	-0.010	-0.073	-0.012	-0.073
	(0.053)	(-1.597)	(-0.242)	(-1.278)	(-0.292)	(-1.269)
Size of Economy	-0.692***	0.064	-0.754***	0.165	-0.772***	0.145
	(-4.230)	(0.603)	(-3.724)	(1.324)	(-4.444)	(1.135)
Inflation	0.217***	0.014	0.214***	-0.036	0.213***	-0.031
	(3.609)	(0.164)	(3.101)	(-0.469)	(3.032)	(-0.393)
Time Dummies	YES	YES	YES	YES	YES	YES
Observations	1,994	1,994	1,722	1,722	1,722	1,722
Log-likelihood	-420.1	-1257	-343.8	-1045	-343.8	-1045

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced and voluntary CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. A positive coefficient indicates that the covariate increases the hazard rate for a CEO to be replaced and hence shortens the expected tenure. Idiosyncratic *ES* is the expected return below the 5th percentile of residual returns from the market model and the systematic *ES* is the expected return below the 5th percentile of predicted returns from the market model, as specified in equation (2). In Model (3), the systematic risk measure is replaced by Acharya et al.'s (2017) Marginal Expected Shortfall (MES) which is another measure of aggregate system-wide risk. For consistency, the systematic and idiosyncratic returns have also been estimated following Jenter and Kannan (2015). All other variables have been defined in Table A1 provided in the Appendix. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 5
Forced CEO Turnover and Expected Shortfall (ES): Is it Poor Performance?

	Excluding Low Returns		Excluding Low Returns + High Volatility	
	(1)	**(2)**	**(3)**	**(4)**
Idiosyncratic *ES*	1.347*	1.232*	1.214*	1.197*
	(1.797)	(1.641)	(1.736)	(1.743)
Systematic *ES*	0.076		0.031	
	(0.279)		(0.123)	
MES		-0.074		-0.097
		(-0.256)		(-0.392)
Idiosyncratic Returns	2.244	2.973	3.013	2.878
	(0.294)	(0.399)	(0.512)	(0.539)
Systematic Returns	-0.638	-0.674	-0.363	-0.376
	(-0.624)	(-0.574)	(-0.383)	(-0.394)
Idiosyncratic Volatility	2.748	5.063	6.473	7.479
	(0.441)	(0.867)	(1.109)	(1.567)
Systematic Volatility	10.399	12.788	7.659	9.814
	(1.236)	(1.587)	(1.094)	(1.556)
Other Controls	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
Observations	872	872	1,143	1,143
Log-likelihood	-123.3	-124	-145.3	-145.2

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. We divide the sample into observations with high (above median) and low (below median) idiosyncratic returns and for brevity show results for the forced turnover sample. A positive coefficient indicates that the covariate increases the hazard rate for a CEO to be replaced and hence shortens the expected tenure. All other variables have been defined in Table A1 provided in the Appendix. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 6
Forced CEO Turnover and Expected Shortfall (*ES*): Impact of Bank Market Concentration.

	(1)	(2)
Idiosyncratic *ES*	1.054***	1.068***
	(3.080)	(2.765)
Systematic *ES*	0.017	
	(0.108)	-0.038
MES		(-0.224)
Idiosyncratic *ES* * Bank Concentration	-1.112**	-1.080**
	(-2.408)	(-2.194)
Systematic *ES* * Bank Concentration	0.084	
	(1.210)	
MES * Bank Concentration		0.097
		(0.880)
Bank Concentration	-0.752**	-0.763**
	(-2.521)	(-2.371)
Idiosyncratic Returns	-0.484	-0.405
	(-0.323)	(-0.274)
Systematic Returns	-0.951	-0.955*
	(-1.638)	(-1.864)
Idiosyncratic Volatility	4.458*	4.779**
	(1.784)	(2.136)
Systematic Volatility	-0.619	0.358
	(-0.162)	(0.088)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-339.4	-339.8

This Table estimates competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. Bank Concentration is measured as the log of the Herfindahl index of bank deposits in each country. A positive coefficient on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic ES. All other variables have been defined in Table A1 provided in the Appendix. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 7
Forced CEO Turnover and Expected Shortfall (*ES*): Which Bank Stakeholders Care More About Tail Risks?

Panel A: Impact of Subordinated Debt Discipline	(1)	(2)
Idiosyncratic *ES*	0.692**	0.634*
	(2.197)	(1.776)
Systematic *ES*	0.087	
	(0.656)	
MES		0.049
		(0.337)
Idiosyncratic *ES* * Subordinated Debt	0.588*	0.667**
	(1.799)	(1.971)
Systematic *ES* * Subordinated Debt	0.021	
	(0.385)	
MES * Subordinated Debt		-0.021
		(-0.282)
Subordinated Debt	-1.413	0.484
	(-0.084)	(0.030)
Idiosyncratic Returns	-0.654	-0.705
	(-0.378)	(-0.408)
Systematic Returns	-1.199**	-1.181**
	(-2.201)	(-2.267)
Idiosyncratic Volatility	5.145*	6.337**
	(1.780)	(2.228)
Systematic Volatility	-1.365	-1.316
	(-0.447)	(-0.404)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,449	1,449
Log-likelihood	-318	-318.4
Panel B: Impact of Insider Ownership		
Idiosyncratic *ES*	0.852***	0.786**
	(2.723)	(2.412)
Systematic *ES*	0.051	
	(0.322)	
MES		-0.029
		(-0.196)
Idiosyncratic *ES* * Insider Ownership	0.020*	0.018*
	(1.746)	(1.677)
Systematic *ES* * Insider Ownership	0.001	
	(0.756)	
MES * Insider Ownership		0.003
		(1.495)
Insider Ownership	0.003	-0.003
	(0.727)	(-0.645)
Idiosyncratic Returns	-1.352	-1.730
	(-0.847)	(-1.147)
Systematic Returns	-0.862	-0.729
	(-1.456)	(-1.373)
Idiosyncratic Volatility	5.490*	6.616**
	(1.910)	(2.516)
Systematic Volatility	-1.606	-0.617
	(-0.380)	(-0.164)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-343.1	-341.2
Panel C: Impact of Supervisory Power		
Idiosyncratic *ES*	0.693*	0.658*
	(1.858)	(1.672)
Systematic *ES*	0.075	
	(0.485)	
MES		0.036
		(0.256)
Idiosyncratic *ES* * Supervisory Power	-0.073	-0.079
	(-0.356)	(-0.376)
Systematic *ES* * Supervisory Power	0.035	
	(1.518)	
MES * Supervisory Power		0.047*
		(1.706)
Supervisory Power	0.066	0.063
	(0.563)	(0.509)
Idiosyncratic Returns	-0.585	-0.570
	(-0.356)	(-0.360)
Systematic Returns	-0.962	-0.951*
	(-1.577)	(-1.709)
Idiosyncratic Volatility	5.498**	5.969**
	(2.047)	(2.208)
Systematic Volatility	-2.237	-1.775
	(-0.527)	(-0.457)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-344.9	-343.5

[Table continued]

[Table continued]

Panel D: Impact of Institutional Ownership		
Idiosyncratic *ES*	0.637**	0.673**
	(2.122)	(1.967)
Systematic *ES*	0.012	
	(0.082)	
MES		-0.030
		(-0.197)
Idiosyncratic *ES* * Institutional Ownership	0.003	0.003
	(0.262)	(0.239)
Systematic *ES* * Institutional Ownership	-0.002	
	(-1.275)	
MES * Institutional Ownership		-0.003
		(-1.289)
Institutional Ownership	0.014**	0.014**
	(2.444)	(2.393)
Idiosyncratic Returns	-0.708	-0.579
	(-0.455)	(-0.374)
Systematic Returns	-0.828	-0.830
	(-1.326)	(-1.485)
Idiosyncratic Volatility	5.830**	5.788**
	(2.236)	(2.310)
Systematic Volatility	-1.081	-0.215
	(-0.269)	(-0.054)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-344.1	-344.3

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. A positive coefficient on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic ES. All other variables have been defined in Table A1 provided in the Appendix. For brevity, only relevant covariates are shown in each Panel. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Table 8
Forced CEO Turnover and Expected Shortfall (*ES*): Is Systematic Tail Risk Exogenous?

Panel A: Shift towards a Macro-Prudential Framework	(1)	(2)
Idiosyncratic *ES*	1.184***	1.180***
	(2.719)	(2.612)
Systematic *ES*	0.016	
	(0.089)	
MES		-0.030
		(-0.200)
Idiosyncratic *ES* * Post-2010	-0.776	-0.770
	(-1.634)	(-1.641)
Systematic *ES* * Post-2010	0.201*	
	(1.768)	
MES * Post-2010		0.210*
		(1.860)
Idiosyncratic Returns	-0.899	-0.676
	(-0.594)	(-0.266)
Systematic Returns	-0.840	-0.825
	(-1.421)	(-1.609)
Idiosyncratic Volatility	4.775*	5.013*
	(1.662)	(1.701)
Systematic Volatility	-2.537	-1.722
	(-0.543)	(-0.405)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-345.7	-345.8
Panel B: Impact of SIFI		
Idiosyncratic *ES*	0.899**	0.910**
	(2.211)	(2.044)
Systematic *ES*	0.030	
	(0.172)	
MES		-0.061
		(-0.366)
Idiosyncratic *ES* * SIFI	-1.869	-1.605
	(-1.620)	(-1.627)
Systematic *ES* * SIFI	0.312*	
	(1.960)	
MES * SIFI		0.484***
		(3.237)
SIFI	-0.512	-0.643
	(-0.523)	(-0.772)
Idiosyncratic Returns	-0.603	-0.639
	(-0.345)	(-0.366)
Systematic Returns	-0.889	-0.955**
	(-1.638)	(-1.986)
Idiosyncratic Volatility	-2.599	-1.069
	(-0.524)	(-0.236)
Systematic Volatility	5.512*	6.010**
	(1.923)	(2.056)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-344.6	-343.8
Panel C: Impact of Blanket Guarantee		
Idiosyncratic *ES*	0.533*	0.611*
	(1.832)	(1.788)
Systematic *ES*	0.038	
	(0.353)	
MES		0.071
		(0.397)
Idiosyncratic *ES* * Blanket Guarantee	4.674	5.365
	(1.434)	(1.335)
Systematic *ES* * Blanket Guarantee	-0.236*	
	(-1.686)	
MES * Blanket Guarantee		-0.370**
		(-2.560)
Blanket Guarantee	-1.489	-1.601
	(-0.752)	(-0.659)
Idiosyncratic Returns	-1.130	-0.971
	(-0.713)	(-0.522)
Systematic Returns	-0.755	-0.872**
	(-1.433)	(-2.017)
Idiosyncratic Volatility	5.131*	5.021*
	(1.711)	(1.726)
Systematic Volatility	-1.516	-1.810
	(-0.447)	(-0.407)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-340.2	-342.5

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. Panel A uses a Post-2010 dummy that equals one for the post-2010 period and zero otherwise. Panel B uses SIFI as an indicator variable that equals one for banks that are systemically important financial institutions. Panel C uses Blanket Guarantee as an indicator variable that equals one for the time period over which bank liabilities in each country were insured. A positive coefficient on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic ES. All other variables have been defined in Table A1 provided in the Appendix. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

APPENDIX

A.1. Econometric Methodology

We adopt the Cox (1972) proportional hazard model that estimates the time to occurrence of a turnover event. The hazard model takes into account the occurrence of a turnover (forced or voluntary) and the time at which this event occurs.[20] The dependent variable in our hazard model is the CEO's tenure and the corresponding hazard function is given by:

$$h_i(t,X) = \lim_{dt \to 0} \frac{P(t<T<t+dt \mid T>t,X)}{dt} \quad \text{(A.1)}$$

$$h_i(t,X) = h_0(t)\exp(X_{i,j}) \quad \text{(A.2)}$$

where equation (A.1) shows that the hazard function $h_i(t,X)$ represents the instantaneous risk that a specific CEO turnover event will occur, conditional on the fact that the CEO has thus far remained with the firm. Equation (A.2) represents the commonly-used exponential functional form of the hazard function, where $h_0(t)$ represents a common baseline hazard for all subjects in our sample, and $X_{i,j}$ represents the vector of covariates. Furthermore, our econometric framework takes into account that each CEO can be thought of being at some risk of exit, either through dismissal or voluntarily leaving the current position, throughout his/her tenure and this risk can be expressed through the following cause-specific hazard rate:

$$h_{r,i}(t) = h_{r,0}(t)\, exp(Risk_{r,i}, BF_{r,i}, ID_{r,i}, ED_{r,i}, CC_{r,i}) \quad \text{(A.3)}$$

where **r** represents the type of competing risk (forced or voluntary); $h_{r,i}(t)$ represents the cause-specific underlying hazard estimated simultaneously for both competing risks; *Risk* is the key explanatory variable, *BF* is a vector of bank fundamentals, *ID* is a vector of variables capturing internal discipline mechanisms, *ED* is a vector of variables capturing external discipline mechanisms, *CC* is a vector of country controls. Note that we allow for the point-estimate

[20] A large number of prior studies have employed static models (e.g. probit and logit) to assess the determinants of CEO turnovers (e.g. Bushman et al., 2010; Huson et al., 2001; Parrino, 1997; Schaeck et al., 2011). However, using a hazard model over such traditional techniques offers advantages (Brookman and Thistle, 2009; Hazarika et al., 2012). For instance, static models simply estimate the probability of an event occurring at some point during the examination period, whereas hazard models explicitly take into account the period over which a CEO is at risk and when the turnover event will occur. Put simply, Cox proportional hazard models account for the probability of turnover, conditional on the fact that the CEO has thus far remained with the firm and hence the time-to-occurrence of the event is informative about the risk of termination. Another advantage of the Cox proportional model is that it explicitly accounts for right-censoring of our data, thereby taking into account that the CEOs in our sample will eventually exit even if we do not observe this during our examination period. By contrast, the generic assumption of static models is that all CEOs at end of the sample period will never be fired or leave the firm.

of covariates to be different for each exit event. A positive coefficient on our covariates implies an increase in the cause-specific risk of a turnover.

The choice of this method is motivated by the fact that, *ex ante*, there is no reason to believe that the underlying data generating processes for forced and voluntary turnovers follow the same underlying hazard rate. In contrast, there are strong reasons to expect that the underlying causal process for each competing event is different. For instance, firm performance may play a different role in explaining the likelihood of CEO turnovers. A CEO is more likely to be dismissed when performance is poor (e.g. high firm risk and poor returns) (Bushman et al., 2010; Huson et al., 2001; Parrino, 1997). Similarly, Gregory-Smith et al. (2009) also argue that the likelihood of dismissal decreases as a CEO becomes more entrenched within the firm, although the likelihood of retirement increases mechanically.

A2. Additional Tables

Table A1
Variable Definitions.

Variable	Definition
Idiosyncratic *ES*	Average residual returns below the 5th percentile of the yearly distribution (%) using the specified market model in equation (2), multiplied by -1.
Systematic *ES*	Average predicted returns below the 5th percentile of the yearly distribution (%) using the specified market model in equation (2), multiplied by -1.
Marginal Expected Shortfall (MES)	Average bank returns corresponding to the bottom 5th percentile of the yearly distribution (%) of the aggregate banking sector in each country.
Idiosyncratic Returns	% Annualized daily values of residual stock returns using the specified market model in equation (2) computed at yearly intervals.
Systematic Returns	% Annualized daily values of predicted stock returns using the specified market model in equation (2) computed at yearly intervals.
Idiosyncratic Volatility	Standard deviation of residual stock returns using the specified market model in equation (2) computed at yearly intervals.
Systematic Volatility	Standard deviation of predicted stock returns using the specified market model in equation (2) computed at yearly intervals.
Profitability	ROA – mean ROA of the banking industry, expressed in percentages.
Industry Profitability	Mean ROA of the banking industry, expressed in percentages.
Bank Size	Natural log of total assets.
Bank Capital	Book value of Equity/Book value of Assets, expressed in percentages.
Charter Value	Market value of Assets/Book value of Assets, where market value is the sum of market value of equity and book value of liabilities
Board Size	Natural log of the number of board members.
Independent Directors	% of independent directors on the board.
CEO Power	Yearly index computed as the sum of two indicator variables: CEO also serves as the Chairman and presence of an internal CEO. Yes = 1 and No = 0.
Insider Ownership	% of shares owned by insiders, excluding the CEO, in the bank, as defined by S&P Capital IQ.
Risk Governance	Yearly index computed as the sum of two indicator variables: presence of a Chief Risk Officer and presence of Risk Committee. Yes = 1 and No = 0.
Bank Concentration	Natural log of Herfindahl Index for bank deposits in each country.
Supervisory Power	Extent of supervisory power to correct problems. As used in Barth et al. (2004) and constructed from the World Bank Survey of Bank Regulation and Supervision.
Institutional Ownership	% of shares owned by institutional investors, as defined by S&P Capital IQ.
Crisis	Indicator variable that equals one for each country-year combination that had a systemic banking crisis.
Post-2010	Indicator variable that equals one for the post-2010 period, and zero otherwise.
SIFI	Indicator variable that equals one for banks present in the list of global systemically important financial institutions by the Financial Stability Board post 2010
Blanket Guarantee	Indicator variable that equals one for the time period over which bank liabilities in each country were insured.
Director Liability Index	Extent of director liability that measures the ability of minority shareholders to hold directors liable for inappropriate firm behavior as reported in the World Bank's Doing Business Report.
Activity Restrictions	Extent of regulatory restrictions placed on bank activities. As used in Barth et al. (2004) and constructed from the World Bank Survey of Bank Regulation and Supervision.
Development	GDP per capita (million US$).
Fiscal Capacity	Government revenues minus expenditures scaled by GDP.
Size of Economy	Natural log of GDP (million US$).
Inflation	% inflation rate.

This Table shows variable definitions. Risk measures and country characteristics are measured at the calendar year-end and bank financials and governance characteristics are measured at the fiscal year-end.

Online Appendix

1. **Reverse Causality**
2. **Alternative Measures of Tail risk**
3. **Alternative Econometric Methods**
4. **Alternative Measures of Banking Market Concentration**
5. **Minimum CEO Tenure and Crisis Effect**
6. **Alternative Explanations of the Blanket Guarantee Effect**

Reverse Causality

Table C1
Forced CEO Turnover and Expected Shortfall (ES): Reverse Causality?

	Idiosyncratic ES	**Systematic ES**	**MES**
	(1)	(2)	(3)
CEO Dismissal Risk	0.006	-0.001	-0.008
	(1.602)	(-1.028)	(-1.582)
Other Controls	YES	YES	YES
Time Dummies	YES	YES	YES
Observations	1,689	1,689	1,688
R-squared	0.834	0.525	0.605

This Table reports the estimates from fixed effects regression that examine the impact of CEO dismissal risk on idiosyncratic and systematic tail risk. CEO dismissal risk is the predicted risk of termination for the CEO, obtained from a survival regression specified in column (2) of Table 4, after excluding risk controls. Idiosyncratic *ES* is the expected return below the 5th percentile of residual returns from the market model and the systematic *ES* is the expected return below the 5th percentile of predicted returns from the market model, as specified in equation (2). In Model (3), the systematic risk measure is replaced by Acharya et al.'s (2017) Marginal Expected Shortfall (MES) which is another measure of aggregate system-wide risk. For consistency, the systematic and idiosyncratic returns have also been estimated following Jenter and Kannan (2015). All other variables have been defined in Table A1 provided in the Appendix. All models include bank and year dummies. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Alternative Measures of Tail Risk

Table C2
Robustness Test: Descriptive Statistics for Alternative Measures of Tail Risk.

	No Turnovers			Forced Turnovers			Voluntary Turnovers		
	Mean	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Idiosyncratic VaR	1.713	1.669	0.697	1.937	1.999	0.723	1.762	1.810	0.709
Systematic VaR	2.492	2.328	1.109	3.135	3.388	1.035	2.568	2.507	1.120
Idiosyncratic Skewness	0.030	0.042	0.126	0.048	0.049	0.077	0.014	0.040	0.171
Systematic Skewness	-0.020	-0.010	0.110	-0.018	-0.015	0.148	-0.009	-0.008	0.118
Idiosyncratic Accounting Downside Risk	0.091	0.000	0.288	0.292	0.000	0.458	0.086	0.000	0.281
Systematic Accounting Downside Risk	0.042	0.000	0.200	0.077	0.000	0.269	0.034	0.000	0.183

This Table presents the descriptive statistics of the data for alternative market-based measures (VaR and Skewness) and accounting-based measure (Accounting Downside Risk) of tail risk. For ease of comparability, we represent descriptive statistics for our most conservative sample used in the main analyses consisting of No-turnover sample (n=1722, n=1722, n=1484), Forced turnover sample (n=74, n=74, n=65), and Voluntary turnover sample (n=198, n=198, n=174) for VaR, Skewness, and Downside Risk, respectively. VaR is measured as the daily bank return corresponding to the 5th percentile of the realized return distribution. Idiosyncratic VaR is the idiosyncratic return corresponding to the 5th percentile of the residuals from the market model while the Systematic VaR is the return corresponding to the 5th percentile of the predicted return from the market model. Skewness is defined as $[(VaR_{50\%} - VaR_{5\%}) - (VaR_{95\%} - VaR_{50\%})]/(VaR_{95\%} - VaR_{5\%})$ multiplied by minus 1, following Bushman et al. (2015). We compute the idiosyncratic and systematic Skewness using the idiosyncratic and systematic VaR estimates. We multiply each of these measures by minus one to keep the interpretation of the results consistent with our previous discussion; namely, higher values of each measure of Skewness indicate higher tail risk. Accounting Downside Risk is measured using a dummy variable that equals one if the ROA of the bank is worse than 1.645 standard deviations below the mean (corresponding to the 5th percentile). The idiosyncratic (or unconditional firm-specific) component of Accounting Downside Risk is a dummy variable that equals one if bank ROA is less than the 5th percentile but industry ROA is more than the 5th percentile. Similarly, the systematic (or conditional system-wide) component of Accounting Downside Risk is a dummy variable that equals one if bank ROA is less than the 5th percentile and industry ROA is less than the 5th percentile. There are 218 crash events, representing 14.7% of our sample, over our sample period and the distribution of crash events over our sample period is comparable to Cohen et al.'s (2014) study. Mean ROA and standard deviation of ROA use rolling 7-year windows.

Table C3
Correlation of Alternative Tail Risk Measures with Volatility.

Panel A: Idiosyncratic Risk components	**(1)**	**(2)**	**(3)**	**(4)**
VaR	1	0.146	0.076	0.924
Skewness	0.267	1	0.039	0.224
Accounting Downside Risk	0.076	0.022	1	0.098
Idiosyncratic Volatility	0.886	0.225	0.103	1
Panel B: Systematic Risk components				
VaR	1	0.223	0.270	0.834
Skewness	0.279	1	0.147	0.207
Accounting Downside Risk	0.266	0.083	1	0.319
Systematic Volatility	0.819	0.179	0.373	1

This Table presents the Spearman (above) and Pearson (below) correlation between various tail risk measures over a more restrictive sample of 1714 observations.

Table C9
CEO Turnover and Tail Risk: Alternative Measures of Tail Risk

	VaR		Skewness	
	(1)		(3)	
	Forced	**Voluntary**	**Forced**	**Voluntary**
Idiosyncratic Tail Risk	0.770*	-0.258	5.326***	-2.030
	(1.951)	(-0.725)	(3.409)	(-1.453)
Systematic Tail Risk	0.241	0.094	-0.774	0.945
	(0.826)	(0.461)	(-0.436)	(0.727)
Idiosyncratic Returns	-0.326	0.972	1.474	0.367
	(-0.205)	(0.923)	(0.906)	(0.358)
Systematic Returns	-0.792	0.182	-1.211**	0.366
	(-1.449)	(0.593)	(-2.059)	(1.194)
Idiosyncratic Volatility	5.233*	1.608	8.772***	-0.060
	(1.663)	(0.527)	(3.856)	(-0.036)
Systematic Volatility	-2.565	-2.728	-1.988	-1.868
	(-0.733)	(-0.944)	(-1.085)	(-1.118)
Other Controls	YES	YES	YES	YES
Time Dummies	YES	YES	YES	YES
Observations	1,722	1,722	1,722	1,722
Log-likelihood	-346.4	-1046	-341.8	-1043

This Table estimates competing-risks hazard regressions that examine the likelihood of forced and voluntary CEO turnovers. The model is estimated with a CEO's turnover risk measured as the CEO's tenure on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic ES. All other variables have been defined in Table A1 provided in the standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Alternative Econometric Methods

Table C10
CEO Turnover and Tail Risk: Alternative Econometric Methods.

	Multinomial Logit				Cox Proportional Hazards	
	(1)		(2)		(3)	(4)
	Forced	**Voluntary**	**Forced**	**Voluntary**	**Forced**	**Forced**
Idiosyncratic ES	0.578*	-0.129	0.616*	-0.188	0.673**	0.689**
	(1.719)	(-0.538)	(1.683)	(-0.767)	(2.365)	(2.140)
Systematic ES	0.049	0.083			0.049	
	(0.633)	(1.484)			(0.295)	
MES			0.045	0.089		-0.014
			(0.428)	(1.227)		(-0.094)
Idiosyncratic Returns	1.209	1.816	1.504	1.537	-0.811	-0.879
	(0.795)	(1.279)	(0.578)	(0.905)	(-0.517)	(-0.568)
Systematic Returns	-0.692	0.098	-0.756	0.014	-0.908	-0.867
	(-1.301)	(0.343)	(-1.454)	(0.049)	(-1.399)	(-1.559)
Idiosyncratic Volatility	5.175*	0.120	5.409*	0.643	5.197*	5.159*
	(1.742)	(0.064)	(1.735)	(0.344)	(1.749)	(1.859)
Systematic Volatility	-2.219	-3.400*	-1.932	-3.485*	-1.858	-0.884
	(-0.729)	(-1.789)	(-0.558)	(-1.672)	(-0.412)	(-0.220)
Other Controls	YES		YES		YES	YES
Time Dummies	YES		YES		YES	YES
Observations	1,722		1,722		1,722	1,722
Log-likelihood	-745.4		-746.1		-335.5	-334.9

This table reports the estimates from alternative econometric methods. Columns (1) and (2) of this table report the estimates from multinomial logit regressions that examine the likelihood of forced and voluntary CEO turnovers. The model is estimated with the dependent variable as Turnover which takes the value of one if there was a forced turnover event and two if there was a voluntary turnover event, and zero otherwise. Columns (3) and (4) of this table report estimates from simple Cox hazard regressions that examine the hazard of forced CEO turnovers. The model is estimated with CEO's dismissal risk measured as the CEO's tenure that is right censored as of December 31, 2013. All voluntary turnovers are treated as censored, following Brookman and Thistle (2009) and Jenter and Kannan (2015). A positive coefficient indicates that the covariate increases the likelihood of cause-specific CEO turnover. All other variables have been defined in Table A1 provided in the Appendix. All models include year indicators. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Minimum CEO Tenure and Crisis Effect

Table C11
CEO Turnover and Tail Risk: Additional Tests

Panel A: Minimum Stipulated Time a CEO Should Have Held Office Before Leaving.	(1) Forced	(1) Voluntary	(2) Forced	(2) Voluntary
Idiosyncratic ES	0.609*	-0.149	0.671*	-0.237
	(1.821)	(-0.424)	(1.748)	(-0.637)
Systematic ES	-0.026	0.064		
	(-0.137)	(0.709)		
MES			-0.079	0.045
			(-0.391)	(0.472)
Idiosyncratic Returns	-0.374	1.099	-0.297	1.109
	(-0.197)	(1.201)	(-0.165)	(1.253)
Systematic Returns	-1.191	0.247	-1.201*	0.216
	(-1.624)	(0.725)	(-1.772)	(0.660)
Idiosyncratic Volatility	6.310*	-0.345	6.182*	0.318
	(1.745)	(-0.143)	(1.844)	(0.128)
Systematic Volatility	0.269	-2.654	1.349	-2.438
	(0.054)	(-0.941)	(0.253)	(-0.889)
Other Controls	YES	YES	YES	YES
Time Dummies	YES	YES	YES	YES
Observations	1,690	1,690	1,690	1,690
Log-likelihood	-263.5	-908.3	-263.3	-908.4
Panel B: Controlling for the Impact of Crisis.				
Idiosyncratic ES	0.824***	-0.332	0.821**	-0.368
	(2.893)	(-1.038)	(2.521)	(-1.092)
Systematic ES	0.023	0.092		
	(0.147)	(1.046)		
MES			-0.009	0.066
			(-0.060)	(0.731)
Idiosyncratic Returns	-0.603	1.079	-0.595	1.180
	(-0.410)	(0.906)	(-0.410)	(1.006)
Systematic Returns	-0.809	0.236	-0.828	0.190
	(-1.341)	(0.664)	(-1.504)	(0.569)
Idiosyncratic Volatility	4.387*	1.015	4.611*	1.439
	(1.692)	(0.421)	(1.827)	(0.574)
Systematic Volatility	-2.066	-2.150	-1.504	-1.570
	(-0.496)	(-0.893)	(-0.356)	(-0.700)
Crisis	0.388	-1.074***	0.391	-1.072***
	(0.953)	(-3.445)	(0.952)	(-3.405)
Other Controls	YES	YES	YES	YES
Time Dummies	YES	YES	YES	YES
Observations	1,722	1,722	1,722	1,722
Log-likelihood	-345.9	-1039	-345.9	-1039

This table reports from competing-risks hazard regressions that examine the likelihood of forced and voluntary CEO turnovers. The model is estimated with CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. Panel (A) reports the estimates after excluding all those turnover events that take place less than two years of a CEO taking her office. Panel (B) controls for the impact of systemic crises using *Crisis*, which is a dummy variable that takes the value of one for every year-country combination in which a systemic banking crisis occurred (as identified by Laeven and Valencia, 2012), and zero otherwise. A positive coefficient indicates that the covariate increases the hazard of cause-specific CEO turnover. All other variables have been defined in Table A1 provided in the Appendix. All models include year indicators. The t-statistics are shown in parenthesis and are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Alternative Measures of Banking Market Concentration

Table C12
Forced CEO Turnover and Tail Risk: Alternative Measure of Bank Concentration.

	(1)	(2)
Idiosyncratic ES	1.067***	1.031***
	(2.796)	(2.907)
Systematic ES	-0.024	
	(-0.140)	
MES		-0.083
		(-0.456)
Idiosyncratic ES * Bank Concentration	-3.521***	-3.637***
	(-3.938)	(-3.849)
Systematic ES * Bank Concentration	0.207	
	(1.365)	
MES * Bank Concentration		0.273
		(1.486)
Bank Concentration	-1.266**	-1.428***
	(-2.520)	(-2.792)
Idiosyncratic Returns	-0.090	0.087
	(-0.050)	(0.056)
Systematic Returns	-0.833*	-0.718
	(-1.700)	(-1.599)
Idiosyncratic Volatility	7.774***	7.504***
	(2.642)	(3.067)
Systematic Volatility	0.613	1.362
	(0.136)	(0.319)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-337.1	-333.9

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. Bank Concentration is measured as the log of the market share of bank deposits held by top-4 banks in each country. A positive coefficient on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic tail risk. All other variables have been defined in Table A1 provided in the Appendix. Standard errors are clustered at the country level have been shown in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Alternative Explanations of the Blanket Guarantee Effect

Table C13
Forced CEO Turnover and Tail Risk: Impact of Banking Crises

Panel A: Impact of Banking Crises	(1)	(2)
Idiosyncratic ES	0.925**	0.919**
	(2.489)	(2.165)
Systematic ES	0.064	
	(0.344)	
MES		0.008
		(0.046)
Idiosyncratic ES * Banking Crisis	-0.598	-0.616
	(-1.496)	(-1.548)
Systematic ES * Banking Crisis		-0.049
		(-0.544)
MES * Banking Crisis	-0.073	
	(-0.777)	
Banking Crisis	0.795	0.714
	(1.398)	(1.227)
Idiosyncratic Returns	-0.544	-0.599
	(-0.348)	(-0.390)
Systematic Returns	-0.842	-0.895*
	(-1.469)	(-1.812)
Idiosyncratic Volatility	5.715**	6.218**
	(2.103)	(2.220)
Systematic Volatility	-2.728	-1.848
	(-0.561)	(-0.395)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-347.3	-347.5
Panel B: Impact of Blanket Guarantee		
Idiosyncratic ES	0.647**	0.660**
	(2.182)	(2.192)
Systematic ES	1.863	
	(0.168)	
MES		0.034
		(0.204)
Idiosyncratic ES * Blanket Guarantee	3.976	4.066
	(1.178)	(1.197)
Systematic ES * Blanket Guarantee	-0.594*	
	(-1.745)	
MES * Blanket Guarantee		-0.570**
		(-1.960)
Blanket Guarantee	-0.644	-0.927
	(-0.391)	(-0.579)
Idiosyncratic Returns	-0.433	-0.698
	(-0.275)	(-0.485)
Systematic Returns	-0.905**	-0.831*
	(-1.973)	(-1.721)
Idiosyncratic Volatility	5.184*	4.601*
	(1.745)	(1.777)
Systematic Volatility	-1.321	-2.018
	(-0.349)	(-0.467)
Other Controls	YES	YES
Time Dummies	YES	YES
Observations	1,722	1,722
Log-likelihood	-343.1	-342.2

This Table reports the estimates from competing-risks hazard regressions that examine the likelihood of forced CEO turnovers. The model is estimated with CEO's turnover risk measured as the CEO's tenure that is right censored as of December 31, 2013. Banking Crisis is a measure of panic, which takes a value of one if the country experienced a systemic banking crisis in that year. We extract crisis data from the Systemic Banking Crises Database available on the IMF website. A positive coefficient on the interaction term indicates that the covariate increases the sensitivity of CEO turnovers to changes in idiosyncratic and systematic tail risk. Blanket Guarantee is a dummy variable equal to one when the guarantee covers bank debt in non-systemic crisis periods. All other variables have been defined in Table A1 provided in the Appendix. Standard errors are clustered at the country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.