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By *Ivan Lim, Jens Hagendorff and Seth Armitage*

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Abstract

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JEL Classification: G21, G28, G32, D72
Keywords: banks, regulatory connections, risk-shifting, public subsidies, regulation

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1. Introduction

There are increasing concerns that close relationships between regulators and bankers undermine the effectiveness of financial supervision. Anecdotal evidence lends support to these concerns. Jamie Dimon, CEO of JPMorgan Chase, served on the board of the Federal Reserve Bank of New York in 2012, at the time JPMorgan incurred a multi-billion dollar trading loss.[1] Similarly, Mary Pugh, chair of Washington Mutual Bank's finance committee when the bank incurred large losses that contributed to its bankruptcy in 2008, previously held directorship positions at the Federal Reserve Bank of San Francisco.[2] Are these isolated cases where regulators appear to be less effective when supervising connected banks? Our study provides systematic evidence that connections between regulators and banks undermine effective supervision and allow banks to access larger public subsidies at the expense of taxpayers.

Our study uses detailed data from the CVs of board directors of public listed bank holding companies (BHCs) from 2001 to 2013. We construct bank-level measures of connectedness to the Federal Reserve (Fed), the Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), the Office of Thrift Supervision (OTS), the U.S. Securities and Exchange Commission (SEC) and state-level banking regulators. Banks are connected if directors have either previously been employed by regulators (*revolving door directors)* or are currently or previously serving in advisory positions at regulators as a form of public service (*public service directors)*. We document that connections between banks and regulators are widespread. More than a third of banks in our sample (157 out of 448) have at least one director

[1] "Dimon and the Fed's Legitimacy", New York Times, Economix Blog.
http://economix.blogs.nytimes.com/2012/05/24/dimon-and-the-feds-legitimacy/
[2] "WaMu board director forced out", Financial Times, 16 April 2008.
http://www.ft.com/cms/s/0/c754825c-0b2f-11dd-8ccf-0000779fd2ac.html#axzz3mNlNDZx5

with connections to regulators. The majority of these connections are established while directors serve in public service positions (86%) as compared to revolving door employments (14%).

Our study computes the *implicit* public subsidies afforded to banks under a publicly guaranteed financial safety-net. We exploit Merton's (1977) characterization of deposit insurance as a put option underwritten by the FDIC (and consequently, the taxpayer), and a framework developed by Duan, Moreau and Sealey (1992) and Hovakimian and Kane (2000). Under this framework, banks are able to access larger public subsidies and shift risk to the safety-net if increases in risk are not met with commensurate increases in capital.[3] We investigate if connections allow banks to exploit regulatory discretion and hold less capital as their asset risk increases and, as a result, access larger financial safety-net subsidies. If so, connections would be valuable to bank shareholders and let banks evade regulatory discipline.

Our main results show that regulatory connections enable banks to access larger public subsidies. For the same increase in portfolio risk, connected banks are required to increase capital less than non-connected banks. Thus, connections allow banks to evade regulatory discipline by permitting them to be more leveraged for a given level of portfolio risk than non-connected banks.

We document next that the resulting subsidies are valuable to the shareholders of connected banks. Increases in public subsidies at connected banks are positively associated with higher stock and accounting performance and an increased probability of larger payouts to shareholders (dividends and repurchases). Risk-shifting in pre-crisis periods is also associated with a higher capital allocation under the Troubled Asset Relief Program (TARP) in 2008/09. Overall, we find

[3] We use the terms risk-shifting to the safety-net and accessing larger public subsidies interchangeably in this study.

strong evidence that connections undermine regulatory effectiveness and facilitate a wealth transfer from taxpayers to the shareholders of connected banks.

Our main findings of risk-shifting are robust to concerns that connections could be endogenous. We control for time-invariant omitted variables with firm fixed effects, for selection bias using Heckman's (1979) two-step maximum likelihood estimates, and issues of reverse causality and omitted time-variant bias by employing a two-stage least-squared analysis (2SLS). Both the Heckman (1979) and the 2SLS estimations requires us to identify instruments which are related to connections but not to risk-shifting. We employ the age of the bank as a source of exogenous variation for connections in our Heckman (1979) selection equation and in our 2SLS estimates. We argue that older banks enjoy the benefits of higher reputation and visibility which facilitates the establishment of connections. Crucially, age is not plausibly related to a bank's per-period public subsidies. Our results continue to hold against various robustness tests, including different definitions of regulatory connections, a different method of estimating safety-net subsidies, controlling for political connections and lobbying by banks, explanations that connections are linked to bank size and too-big-to-fail status, and controlling for differences in enforcement between federal regulatory agencies.

Our detailed data on regulatory connections also allow us to explore why connected banks are able to access larger public subsidies. We test—and find no empirical support for—two frequently-cited explanations of the benefits of regulatory connections: (i) connections facilitate quid-pro-quo arrangements, where regulators are friendly with the industry, to secure future employment opportunities (Cohen, 1986; Che, 1995; Dal Bó, 2006; DeHaan, Koh, Kedia and Rajgopoal, 2014; Cornaggia, Cornaggia and Xia, 2015), or (ii) connections lead to knowledge transfer where connected directors with superior technical expertise in supervision and enforcement aid risk-shifting (Che, 1995; Dal Bó, 2006; Lucca, Seru and Trebbi, 2014).

First, we test if connections facilitate quid-pro-quo practices. Quid-pro-quo behavior is a form of corruption that cannot be directly detected in data sets (Kane, 2014). However, cross-country studies have shown that weaker institutions leave more discretion in the hands of policymakers and therefore leave more opportunities for corruption (cf. Dinç, 2005, Beck, Demirgüç-Kunt and Levine, 2006; Barth, Lin, Lin and Song, 2009). We exploit variations in corruption and integrity scores at the level of US states to capture differences in the quality of the institutional environment for different banks. We do not find that risk-shifting by connected banks is more pronounced in states with weaker institutional quality and, therefore, we find no evidence that connections are linked to quid-pro-quo behavior.

Further, the idea that knowledge transfer is driving our results is not supported by two tests we run. First, we show that access to public subsidies not only occurs through revolving door appointments but also when bank boards are connected via public service appointments. Public service directors hold no influence over matters of supervision or enforcement but only act in an advising capacity mostly on matters regarding monetary policy and internal procedures (see Board of Governors of the Federal Reserve, 2013; Federal Deposit Insurance Corporation, 2015).[4,5] So it seems unlikely that knowledge transfer is the primary reason behind risk-shifting at connected banks.

[4] For instance, in the case of the Federal Reserve, advisory directors participate in the formulation of monetary policy and act as a link between regulators and the public. 'Directors are responsible for supervising the administration of the Reserve Bank's operations, overseeing the Reserve Bank's corporate governance function, and maintaining an effective system of internal auditing procedures and controls. Directors are not involved, however, in any matters related to banking supervision, including supervisory decisions' (Board of Governors of the Federal Reserve System, 2013, p.2). Specifically, 'directors may not be consulted regarding bank examination ratings,

Second, and in further conflict with the idea that knowledge transfer from regulators is driving our results, we exploit differences in the charter types of the commercial banks operating under the BHC. Depending on their type of charter, commercial banks could be regulated by the Fed, OCC or FDIC. Crucially, regulations pertaining to the supervision of banks are universal across regulators in the US (Agarwal, Lucca, Seru and Trebbi, 2014). Therefore, if risk-shifting on the back of regulatory connections is related to technical expertise, risk-shifting should be observed regardless of whether the connection exists to the responsible regulator. Put another way, if the safety-net benefits of connected banks are based on knowledge transfer, banks with Fed connections should equally be able to access these subsidies even when regulated by the FDIC or OCC. After demonstrating that there is no difference in risk-shifting under the different federal regulators, we then show that risk-shifting only takes place when BHCs have connections to the Fed and are being regulated by the Fed at the commercial bank level but not when regulated by the FDIC or the OCC.

Overall, our results show that neither quid-pro-quo arrangements nor technical expertise explain risk-shifting by connected banks. We offer an alternative explanation. The laxer supervision offered to connected banks is suggestive of a psychological bias (Barth, Caprio and Levine, 2012). Our results suggest that connections change the dynamics of the supervisor-supervisee relationship to undermine monitoring by regulators (Mills and Clark, 1982; Silver, 1990). Our psychological-bias explanation need not rely on direct and personal contact between

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potential enforcement actions, application/approval matters, and other such supervisory matters' (pg. 41). Further, advisory directors are also excluded from yielding indirect influence via appointing regulators. They are excluded from the selection, appointment, and compensation of regulators whose main responsibilities are in the area of supervision and from any of the most senior appointments.

[5] Descriptions of the objectives of individual advisory councils are obtained from the individual regulator's websites. See http://www.federalreserve.gov/aboutthefed/advisorydefault.htm, https://www.fdic.gov/about/index.html#2 and https://www.sec.gov/index.htm for further information.

connected directors and regulators. Regulators could simply be aware that connected directors have connections to the agency, and as a result, be more lenient in supervision.[6] This explanation is similar to that in recent governance research which reports that social connections between CEOs and the board undermine board monitoring (e.g. Hwang and Kim, 2009; Fracassi and Tate, 2012; Khanna, Kim and Lu, 2015).

Our research contributes to several strands of literature. We are the first to link regulatory connections to the efficacy of regulators in terms of exerting discipline on banks and safeguarding taxpayers from loss exposures in the process. The risk-shifting incentives brought upon by safety-net provisions are a pervasive issue (Demirgüç-Kunt and Huizinga, 2004; Nier and Baumann, 2006; Dam and Koetter, 2012; Duchin and Sosyura, 2014) and whether or not certain banks can evade regulatory discipline is an important question.

Second, our paper contributes to studies on regulatory capture (Stigler, 1971; Tirole, 1986; Laffont and Tirole, 1993; Dal Bó, 2006; Correia, 2014) and capture in the financial industry (Mian, Sufi and Trebbi, 2010; Igan, Mishra and Tressel, 2011; Lambert, 2014; Shive and Forster, 2015). Mian, Sufi and Trebbi (2010) find that higher campaign contributions from the financial industry influence politicians' voting behavior regarding financial regulations. Igan, Mishra and Tressel (2011) show that lobbying by financial institutions is positively associated with risk-taking leading up to the crisis, while Lambert (2014) find that lobbying banks are less likely to be subject to severe enforcement actions. Shive and Forster (2015) suggest that financial firms make revolving door hires when the need to reduce risk arises. Our study contributes to this work

[6] Consistent with our interpretation, survey evidence by Veltrop and De Haan (2014) shows that Dutch regulators who previously worked for the financial sector are more likely to socially identify with the industry and that this negatively affects their performance on various regulatory tasks. Additionally, Blanes-i-Vidal, Draca and Fons-Rosen (2012) and Bertrand, Bombardini and Trebbi, (2014) show that lobbyist are valued more for their connections to politicians, rather than their industry expertise.

by demonstrating that personal connections between bankers and regulators function act as a conduit for regulatory capture alongside lobbying and campaign contributions. In particular, we are the first to comprehensively document the interactions between bankers and regulators as a result of public service advisory positions and their effect on regulatory efficacy.

Finally, we document that connections facilitate a wealth transfer from taxpayers to shareholders. The results of previous work on connections are suggestive but not conclusive of a wealth transfer. For instance, extant studies report shareholder wealth gains linked to regulatory and political connections (Acemoglu, Johnson, Kermani, Kwak and Mitton, 2013; Adams, 2013) but do not show that connections are detrimental to taxpayer interests. Further, existing studies show that politically connected banks that received taxpayer-funded bailouts during the 2008/09 crisis took on more risk relative to non-connected banks and were a worse deal for taxpayers (Duchin and Soysura, 2012; 2014). While the latter is similar to the concept of a subsidy we study in this paper, these studies differ from ours in that they focus on the 2008/09 crisis period—crisis periods are typically characterized by heightened policy discretion and a high chance of forbearance by regulators (cf. Brown and Dinç, 2011). By contrast, we present systematic evidence that public subsidies are afforded to connected banks.

2. Empirical model and hypotheses development

2.1 Modelling bank subsidies

The deposit insurance premium model pioneered by Merton (1977) and later developed by Duan, Moreau and Sealey (1992) and Hovakimian and Kane (2000) offers a tool to estimate the subsidies afforded to banks. Merton (1977) models safety-net subsidies as the value of a put option underwritten by the FDIC (and by extension, the taxpayer). On a conceptual level, deposit insurance permits banks to put the assets back to the FDIC at the face value of its debt whenever the value of assets falls below the value of liabilities. It follows that bank shareholders can extract higher public subsidies by increasing the value of the put option if they increase asset risk and leverage (Merton, 1977).[7]

This model is widely used to test for risk-shifting by banks to the financial safety-net (e.g. Duan, Moreau and Sealey, 1992; Hovakimian and Kane, 2000; Hovakimian, Kane and Laeven, 2003; Wagster, 2007; Bushman and Williams, 2012; Carbo-Valverde, Kane and Rodriguez-Fernandez; 2012; 2013).[8] Risk-shifting is distinct from risk-taking in that the former arises when a contractual counterparty (in this case the taxpayer) is inadequately compensated for the risks in which they are exposed. The model permits us to investigate if connections to regulators, who are the custodians of public subsidies, impede the supervisory process and subsequently, allow banks to shift risk in order to extract larger benefits from the financial safety-net.

This paper adopts the quasi-reduced equations developed by Duan, Moreau and Sealey (1992) and Hovakimian and Kane (2000):

$$\Delta(B/V) = \alpha_0 + \alpha_1 \Delta\sigma_V + \varepsilon_1 \quad (1)$$

$$\Delta IPP = \beta_0 + \beta_1 \Delta\sigma_V + \varepsilon_2 \quad (2)$$

[7] The idea corresponds to the valuation of a put option. The value of a put option increases in volatility (bank asset risk) and leverage (the strike price).

[8] Duan, Moreau and Sealey (1992) test if US banks are able to risk shift to the safety-net. Hovakimian and Kane (2000) show that capital regulation the US were not effective in controlling risk-shifting by US banks. Hovakimian, Kane and Laeven (2003) examine how country and safety-net differences affect bank risk-shifting. Wagster (2007) show that the adaptation of explicit deposit insurance expanded risk-shifting incentives for Canadian banks and trusts. Bushman and Williams (2012) show that accounting discretion can influence risk-shifting incentives by banks in an international sample while Carbo-Valverde, Kane and Rodriguez-Fernandez (2012) find that banks conduct cross-border mergers in the EU to arbitrage from safety-net differences. Carbo-Valverde, Kane and Rodriguez-Fernandez (2013) show that too-big-to-fail banks are more able to extract subsidies from the safety-net.

The per-period flow of subsidies to bank shareholders is defined as the 'actuarially fair insurance premium' per dollar of debt (*IPP*). *B* is the book value of debt, *V* the market value of bank assets, *B*/*V* the leverage ratio and σ_V is the volatility of the bank's asset. The computation of IPP requires two unobservable variables: the volatility and the market value of assets. We describe the estimation of these two variables and the computation of *IPP* in Appendix B.

The slope coefficients of the equations (1) and (2) have the following interpretations:

$$\alpha_1 = d(B/V) \,/\, d\sigma_V \tag{3}$$

$$\beta_1 = dIPP \,/\, d\sigma_V = (\partial IPP \,/\, \partial\sigma_V) + \partial IPP \,/\, \partial(B/V)\alpha_1 \tag{4}$$

Equation (1) describes the notion that regulators (and also bank creditors) restrict banks to a certain combinations of leverage and volatility. Accordingly, Equation (1) reflects outside discipline to reduce (increase) bank leverage as an institution's asset risk increases (decreases). Equation (2) measures if banks are able to increase the value of public subsidies by increasing risk after overcoming the effects of discipline imposed by regulators and creditors.

For regulatory and market forces to fully neutralize risk-shifting incentives, two joint conditions have to be satisfied:

(i) Leverage decreases with volatility: $\alpha_1 < 0$

(ii) The value of public subsidies (IPP) does not rise with volatility: $\beta_1 \leq 0$

A negative α_1, while indicative of disciplinary forces imposed on a bank, is insufficient as an indicator of outside discipline mitigating the incentives for risk-shifting. To fully neutralize risk-shifting incentives, a decline in leverage must be sufficiently large to offset increases in the value of public subsidies that would be generated by increasing asset volatility ($\beta_1 \leq 0$). If so, banks would not find it advantageous to increase risk and β_1 would not be positive.[9]

2.2 Hypotheses

We motivate our paper with two competing hypotheses. On the one hand, connections may not undermine the regulatory process if regulators are motivated by a sense of duty and public sector interests (Bond and Glode, 2014) or social purpose (Shiller, 2012), consistent with a 'public interest view'. Furthermore, connections may provide important benefits to both regulators and the industry at no cost to regulatory effectiveness. Connections could facilitate information flows and provide regulators (formally or informally) with valuable information pertaining to economic conditions and industry practices (Board of Governors of the Federal Reserve, 2013). Likewise, connections may offer banks opportunities to comment on and potentially shape regulatory practices that are ineffective (from a policy perspective) but costly to the industry.[10]

On the other hand, connections to regulators may lead to connected banks receiving preferential treatment by regulators. The 'private interest view' put forth by Stigler (1971) argues that regulators are frequently captured by the industry they regulate. Information asymmetry surrounding supervision grants discretionary powers to regulators (Baron and Myerson, 1982; Tirole, 1986; Laffont and Tirole, 1993) who might not necessarily work to promote societal

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[9] It should be pointed out that the existence of risk sensitive deposit insurance premium that requires banks to pay a premium commensurate with risk does not affect the inference of the model. Should the risk sensitive deposit insurance premiums and capital discipline be enough to deter banks from increasing risk, banks would not choose to increase their risk and a $\beta_1 \leq 0$ would still be observed.

[10] Informing regulators and policymakers on ineffective regulations as well as industry concerns are often cited as a key reason behind lobbying (e.g. Blanes-i-Vidal, Draca and Fons-Rosen, 2012; Bertrand, Bombardini and Trebbi, 2014). These studies however show that lobbyist are valued more for their connections to politicians than their expertise, consistent with the key findings in our paper.

welfare, but instead seek to maximize their private interest. Connections could therefore facilitate quid-pro-quo exchanges in which regulatory laxity is exchanged for the prospect of future employment in the banking sector (Lucca, Seru and Trebbi, 2014). Additionally, personal connections could undermine monitoring by making the relationship between supervisors and supervisees more communal (Mills and Clark, 1982; Silver, 1990) and by tempting connected supervisors to socially identify with the banking sector (Barth, Caprio and Levine, 2012; Veltrop and De Haan, 2014). Duchin and Sosyura (2012) find evidence consistent with the private interest view. The authors show that US financial firms with political and regulatory connections are more likely to receive bailout funds during the 2008 crisis.

To empirically analyze if regulatory connections are linked to larger public subsidies, we follow previous studies (Hovakimian and Kane, 2000; Wagster, 2007; Bushman and Williams, 2012; Carbo-Valverde, Kane and Rodriguez-Fernandez, 2012; 2013) and estimate equations (1) and (2) as:

$$\Delta(B/V)_{i,t} = \alpha_0 + \alpha_1 \Delta\sigma_{Vi,t} + \alpha_2(\Delta\sigma_{Vi,t} * RegConnect_{i,t}) + \alpha_3 RegConnect_{i,,t} + Controls + \varepsilon_{i,t} \quad (5)$$

$$\Delta IPP_{i,t} = \beta_0 + \beta_1 \Delta\sigma_{Vi,t} + \beta_2(\Delta\sigma_{Vi,t} * RegConnect_{i,t}) + \beta_3 RegConnect_{i,t} + Controls + \varepsilon_{i,t} \quad (6)$$

RegConnect is our main measure of regulatory connections. It is defined as the number of directors who were or are currently employed by the Fed, FDIC, OCC, OTS, SEC or State level banking regulators scaled by board size. Carbo-Valverde, Kane and Rodriguez-Fernandez (2008) explain that the dialectical nature of the process in which banks devise new strategies to conceal or understate risk to avoid capital requirements makes it advisable to estimate *(B/V)*, σ_V and *IPP* in first-difference form. Our variables of interest are the coefficients α_2 and β_2.

The coefficient α_2 captures the effect of bank connections on the discipline imposed on banks in response to increasing risk.

Hypothesis 1: Connected banks have lower levels of risk-discipline ($\alpha_2 > 0$).

Hypothesis 1a: Connected banks do not have lower levels of risk-discipline ($\alpha_2 \leq 0$).

The interaction term β_2 examines if connected banks gain access to larger public subsidies by evading regulatory discipline imposed on them for higher asset risk.

Hypothesis 2: Connected banks extract higher public subsidies ($\beta_2 > 0$).

Hypothesis 2a: Connected banks do not extract higher public subsidies ($\beta_2 \leq 0$).

3. Data and descriptive statistics

3.1 Sample construction

Our initial sample consists of all public US BHCs from 2000 to 2013 listed on BoardEx, a database maintained by Management Diagnostics Limited. The BoardEx database provides us with detailed biographical and employment (current and historical) data on all board members. BoardEx started collecting data on corporate directors in 2000 from various sources, including, but not limited to SEC filings, company press releases, corporate websites and news outlets. Our sample consists of deposit-taking BHCs with SIC codes starting 602 (commercial banks) and 603 (savings institutions).

< INSERT TABLE 1 >

We then match the BoardEx list of BHCs to 4th Quarter FR Y9-C consolidated accounting information reported by BHCs to the Federal Reserve. Market information is obtained from

CRSP. The final sample contains 3,011 bank-year observations and 448 unique BHCs. Our analysis uses data from 2001 to 2013 due to first differencing. Definitions of the variables used in this study are described in Appendix A. Summary statistics of the variables are reported in Table 1.

3.2 Bank regulatory connections

Our main proxy of a bank's regulatory connections *RegConnect* is defined as the number of connected directors on the board divided by the size of the board. Information on each director's employment history are obtained from BoardEx. We manually supplement missing information from regulators' annual reports, legal documents, LinkedIn, Marquis Who's Who and news articles using Bloomberg, the Wall Street Journal and the Financial Times.

We define directors as connected if they meet either one of two criteria. First, directors have previously worked for the Fed, FDIC, OCC, OTS, SEC, or a state banking regulator before joining the board of the bank. These revolving door directors would have previously held regulatory posts such as bank examiners, staff attorneys, banking commissioners and Fed Reserve Bank presidents. We list the main positions revolving door directors held in regulatory bodies in Panel E of Table 1.

Second, we also define directors as connected if they are currently serving or have previously served in public service positions while also being employed by the bank. We call this type of connected director public service directors. Panel F in Table 1 shows that most of the public service positions held by directors in our sample are with the Fed and typically involve board directorships and advisory roles on various councils. Federal Reserve Bank Directors are responsible for supervising the Reserve Bank's operations, formulation of monetary policy, internal audits, corporate governance functions and evaluation of the President and First Vice-President. Importantly, these directors are excluded from all issues related to bank supervision (Board of Governors of the Federal Reserve System, 2013). The Fed also relies on advisory councils to carry out its responsibilities, for instance when they 'advise the Bank on matters of importance in the Bank's District, such as agriculture and small business' (Board of Governors of the Federal Reserve System, 2015).[11]

Panel B of Table 1 shows some descriptive statistics for our connections variable. In total, 31.48% of bank years have at least one connected director. The most common connection is to the Federal Reserve (84%). Banks are also more likely to be connected via public service appointments (86%) as compared to post-employment (revolving door) appointments (14%.)[12] The high proportion of public service connections is unsurprising as regulatory agencies rely on bankers to fill numerous fixed-term advisory committees and directorship positions.[13]

We also use an alternate definition for regulatory connections as a robustness check. *RegConnectTenure* is the total number of years that all connected directors of the bank board have spent in regulatory agencies. As the time spent in agencies increases, directors would have more opportunities to establish connections and networks. The average time spent by directors of connected banks in agencies is 2.17 years.

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[11] For example, the Community Depository Institutions Advisory Council at the New York Fed 'is composed of representatives from commercial banks, thrift institutions and credit unions in the Second District. The purpose of the council is to provide information and insight to the New York Fed from the perspective of community depository institutions. The New York Fed president and first vice president meet with the council twice a year to discuss regional economic and financial conditions, and other relevant issues' (Federal Reserve Bank of New York, 2015).

[12] The total nominal number of each category of connection differs as a number of directors have multiple positions in different agencies.

[13] For example, Federal Reserve Board directorship as well as some advisory council positions are filled every 3 years (Board of Governors of the Federal Reserve System, 2013)

3.3 Control variables

We include variables corresponding to the CAMELS ratings systems in equation 5 and 6. CAMELS—an acronym for capital adequacy, asset quality, management quality, earnings, liquidity and sensitivity to market risk—is a composite supervisory rating system[14] used by bank regulators to assess the overall stability of a bank. We control for the overall health of the bank as banks in poorer financial condition might have more incentives to shift risk (Eisdorfer, 2008; Bushman and Williams, 2012). By the same token, these banks could be more heavily monitored by regulators which would limit risk-shifting opportunities.

As we are unable to observe the CAMELS ratings issued by regulators to banks, we employ proxies for each component. We measure capital adequacy using *Tier1 Capital* and proxy for asset quality using *Bad Loans*. *Enforcement actions* proxies for management quality (Duchin and Sosyura, 2012). Enforcement actions (i.e. Formal Agreements, Cease and Desist Orders, Prompt Corrective Actions and Civil Money Penalties) are collected from websites of the three federal regulators.[15] When enforcement actions are issued to the commercial bank, we attribute it to the holding company.[16] We further control for bank profitability and liquidity using *ROA* and *Total Deposits,* respectively. We proxy for *Market Risk* using the gap between short-term assets and short term-liabilities scaled by total assets. The gap approximates the net amount of assets and liabilities that is required to be repriced within one year, reflecting the banks sensitivity to interest rate risk.

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[14] See https://www.fdic.gov/regulations/examinations/

[15] Federal Reserve: http://www.federalreserve.gov/, FDIC: https://www5.fdic.gov/edo/ and OCC: http://apps.occ.gov/EnforcementActions/

[16] Shive and Forster (2015) find that financial institutions are more likely to hire ex-regulators in anticipation of regulatory enforcement actions. Including enforcement actions in our models thus also alleviates an omitted variable issue that could be correlated with the regulatory connectedness of the bank.

Further, we control for firm size using the log of Total Assets *Total Assets* as Carbo-Valverde, Kane and Rodriguez-Fernandez (2013) show that too-big-to-fail banks are able to access larger public subsidies. *Charter Value* is also included in our controls and is calculated as the ratio of the market value of equity to the book value of equity and measures a bank's incentives to take on risk. Keeley (1990) explain that the owners of banks with high charter values are less inclined to increase risk as insolvency dissolves the benefits of a highly valued charter arising from the banking business. *Asset Growth* and *Total Loans* measures the aggressiveness of expansion and lending focus of a bank which could affect risk.

Finally, we include as controls a number of board level corporate governance variables that could influence bank risk policies. We proxy for the effectiveness of monitoring and advisory functions of the board using *Board Size* and *Board Independence* (e.g. Yermack, 1996; Boone, Field, Karpoff and Raheja, 2007). Finally, we control for the power of a CEO in affecting risk policies using *CEO Tenure* and if the CEO is also the Chairman of the board *Duality* (Pathan, 2009).

4. Results

4.1 Characteristics of connected banks

We begin our analysis by examining the characteristics of banks with regulatory connections. The results are displayed in Table 2. Columns 1-2 employ bank fixed-effects while Column 3-4 use random-effects for cross-sectional variation. The fixed-effects estimations control for unobserved heterogeneity across BHCs and capture within-BHC changes in the underlying variables to the changes in connections. Columns 2 and 4 lag all dependent variables.

Importantly, portfolio risk (as indicated by σ_V) and *ROA* are both statistically insignificant in all specifications (Columns 1-4). The results suggest that connected banks are indistinguishable in terms of risk and performance compared to non-connected banks. This gives us an a priori indication that our risk-shifting results are unlikely to be driven by concerns over reverse causality. That is, our results do not back explanations that banks that increase risk establish more connections.

Our estimations reveal cross-sectional (Columns 3-4) differences in bank structure between connected and non-connected banks. Connected banks tend to be larger and older. (The coefficients on *Total Assets* and *BHC Age* are significant at the 1% and 10% level, respectively.) Evidently, larger and older banks are more likely to afford higher visibility and reputation to directors, allowing directors at these institutions to establish more connections.

We also find some evidence that connected banks make more loans (*Total Loans* significant at the 5, 10 and 10% level in Columns 1-3) and exhibit more sensitivity to interest rate risk (*Market Risk* statistically significant in at least the 5% level across specifications). Finally, *Charter Value* is negatively associated with bank regulatory connections at the 5 and 10% significance level depending on specifications 1-4. Keeley (1990) explain that lower charter values incentives bank owners to shift risk to the deposit insurance scheme.

< INSERT TABLE 2>

Jointly, the results indicate that connected banks appear to be fairly non-distinct compared to their non-connected peers in terms of performance and risk and provide regulators no reason for additional scrutiny. In the next two sections, we examine if regulatory connections are associated with lower risk discipline and higher safety-net subsidies, respectively.

4.2 Regulatory connections and risk-discipline

Table 3 reports the results of the effects of regulatory connections on risk-discipline (as described in Equation 5). We estimate models in Table 3 using bank fixed-effects and pooled-OLS. The use of within-variation helps correct for unobserved time-invariant omitted variables such as an institution's culture of risk management. Column 1 of Table 3 estimates a conventional baseline model as in Duan, Moreau and Sealey (1992), Hovakimian and Kane (2000), Wagster (2007) and Williams and Bushman (2012). Column 2 introduces our interaction term of interest *RegConnect x* $\Delta\sigma v$. Column 3 adds financial and board governance controls.

< INSERT TABLE 3 HERE >

The coefficient on our interaction term of interest *RegConnect x* $\Delta\sigma v$ is positive and statistically significant at the 1% level in all models. This shows that, as the proportion of regulatory connections increases, connected banks are able to reduce leverage less for the same level of asset risk increase than non-connected banks. Shareholders of connected banks are thus able to engage in capital arbitrage compared to non-connected banks by holding less capital as portfolio risk increases.

In column 5, we use our alternate definition of connections and regress IPP on the total number of years that directors have spent with regulators We continue to find that *RegConnectTenure x* $\Delta\sigma v$ is significant at the 1% level.

4.3 Regulatory connections and risk-shifting

As outlined in Section 3, weakened risk discipline is a necessary but not sufficient condition for the ability of connected banks to extract subsidies from the financial safety-net. For banks to be able to shift risk to the safety-net via regulatory connections, they need to be able to increase the value of the taxpayer put.

< INSERT TABLE 4 HERE >

Table 4 reports results from the second equation of the Duan, Moreau and Sealey (1992) framework as described in Equation 6. This regression measures the sensitivity of the value of the taxpayer put to changes in portfolio risk. Our key coefficient of interest *RegConnect x* $\Delta\sigma v$ is statistically significant and positive at 1%. Thus, connected banks are able to extract higher levels of public subsidies from the safety-net by increasing portfolio risk.

The extraction of higher public subsidies is achieved through the risk-discipline mechanism shown in Section 4.2. Regulatory efforts to impose discipline on banks by making them hold additional capital against increasing asset risk are less effective in connected banks. Consequently, our results indicate that connected banks shift potential losses to the taxpayer. As previously, this finding is robust to us using a different definition of connections *RegConnectTenure*. For brevity, we use *RegConnect* as our main measure of connections for the remainder of the paper as both measures produce identical results.

The empirical results so far show that there is a strong and consistent relationship between regulatory connections and the extraction of public subsidies. However, the identification of a causal link may be confounded by endogeneity, specifically, reverse causality, omitted variable bias, and self-selection. We use a two-stage least square (2SLS) approach to address issues of reverse causality and time-variant omitted variable bias and a Heckman (1979) two-step model to control for self-selection.

We first address concerns our estimates might be biased by reverse causality and time-variant omitted variables. For instance, banks that engage in risk-shifting could actively seek out or establish regulatory connections to safeguard themselves against regulatory scrutiny. In a similar vein, revolving door directors could be more inclined to join the boards of risk-shifting banks on the understanding that their connections and expertise are most valued by these institutions. Additionally, time-variant unobservable variables could jointly affect both regulatory connections and risk-shifting. For example, an increase in the number of non-bank mortgage lenders would heighten competitive pressures on traditional mortgage lenders. This subset of banks could respond by establishing connections to pressure for more regulatory oversight of the new market entrants as well as simultaneously increase their extraction of public subsidies to maintain eroding profits.

To circumvent these concerns, we exploit the role of bank age in facilitating connections between regulators and bank boards. Specifically, we use the age of a BHC *BHCAge* as an instrument for regulatory connections in a 2-Stage Least Squares (2SLS) approach. We argue that older banks are more likely to be more connected due to the higher market visibility and reputation. Crucially, bank age should not be related to changes in the value of the taxpayer put except through regulatory connections.

Our two first-stage estimation fitted values are obtained from Columns 5 and 6 of Table 2. We instrument for *RegConnect* and *RegConnect x* $\Delta\sigma v$ using *BHCAge* and *BHCAge x* $\Delta\sigma v$, respectively. The Kleibergen-Paap F-statistic is 10.2 (above the conventional value of 10, commonly viewed as a threshold in literature), alleviating concerns of weak instruments. In the first-stage, the coefficients on our instrument have the expected signs and are positive. The second-stage regression results are reported in Column 6 of Table 4. The coefficient on *RegConnect x* $\Delta\sigma v$ remains positive and statistically significant at the 1% level.

We next account for self-selection using a Heckman (1979) two-step maximum likelihood estimation. The decision of banks to establish connection could be driven by unobservable private information (Li and Prabhala, 2005) that give rise to an omitted variable bias if correlated with both connections and risk-shifting. For instance, banks may possess private information on poor expected future earnings and could actively choose to get connected to gain additional access to public subsidies.

Column 8 controls for the self-selectivity of connections using the Heckman (1979) two-step estimation. The selection equation is a probit model with controls as specified in Column 1 of Table 2 and dependent variable equaling one if the bank has any connected directors in a year and zero if otherwise. Controlling for the self-selection decision requires identifying variables that are related to banks establishing connections (the first-stage selection equation) while unrelated to risk-shifting (the second-stage). Our choice of this variable is again, the age of the BHC. Older banks are likely to incur lower costs of establishing connections due to reputational advantages and are thus are more likely to establish them. The inverse Mill's ratio *Lambda* is included into the second-stage equation (Column 8 Table 4) to account for the selectivity effect. *Lambda* is insignificant, indicating that there is no relationship between a bank's choice to get connected and risk-shifting. Our interaction term *RegConnect x* $\Delta\sigma v$ continues to remain significant and positive after controlling for potential self-selection issues.

We conduct another test for self-selection bias in Column 7 of Table 4 and exclude banks without regulatory connections and re-run our baseline regression. By excluding banks without connections, we are now observing the effects of connections on risk-shifting by banks that are able or choose to get connected, ameliorating concerns of unobservable differences between banks that may be related to both connections and risk-shifting. Our results remain significant and positive at the 1% level, meaning that even among connected banks, an increase in regulatory connections increases the extraction of public subsidies.

In summary, the results from our 2SLS and Heckman (1979) estimates show that regulatory connections lead to risk-shifting and the extraction of higher public subsidies. Our results are robust to alternate specifications and endogeneity concerns.

4.4 Regulatory connections, risk-shifting, payouts, performance and TARP funds

Results from the previous sections show evidence that connected banks are able to access larger per-period subsidies from the safety-net. The type of risk-shifting behavior underlying this should benefit shareholders who hold convex claims on firm cash flows. We next investigate if access to public subsidies is indeed associated with benefits to shareholders of connected banks in terms of payouts, performance and more capital allocation to financial institutions under the Troubled Asset Relief Program (TARP) in 2008/09.

< INSERT TABLE 5>

Following Boudoukh, Michaely and Richardson (2007), we calculate the *Total Net Payout* to shareholders as the sum of common dividends and net repurchases (common dividends + treasury stock repurchase – treasury stock sales) and scale it by the book value of equity. We exclude banks that do not pay dividends or make share repurchases in our sample. Next, we generate a dummy variable that = 1 if *Total Net Payout* has increased from the previous year. Column 1-2 of Table 5 use an OLS and conditional logit model respectively to model the probability of an increase in net payout to shareholders. Columns 3-4 show regressions on *Buy-Hold Annual Rets* and *ROA* of the bank.

Our variable of interest is the interaction *RegConnect x ΔIPP*. The positive and significant coefficients on this interaction indicate that, all else equal, an increase in public subsidies at connected banks is associated with a higher probability that banks will increase their payouts to shareholders (Columns 1-2). Additionally, we show that risk-shifting by connected banks also leads to higher stock and accounting performance (Columns 3-4). It is worth noting that the coefficient on *RegConnect* remains statistically insignificant in our tests. This is consistent with earlier results indicating that connected banks are not riskier or underperforming.

We also present evidence that connected banks that engage in risk-shifting receive a higher capital allocation under TARP.[17] TARP resulted in the largest federal investment in US history and provides a unique setting in which to confirm that risk-shifting by connected banks results in a wealth transfer from taxpayers to connected banks. Bank controls are measured using 2008 Q3 data while board governance variables are at the end of 2007 and are used as controls for regulators' decision to allocate funds to banks (Duchin and Sosyura, 2012).[18]

Pr(TARP) is a dummy variable that =1 if the bank receives TARP funds while TARP% is the nominal TARP amount scaled by the assets of the bank as at 3rd quarter 2008. The interaction term *RegConnect 01-07 x ΔIPP 01-07* is the mean values of *RegConnect* and *ΔIPP* from 2001 to 2007. The coefficient of the interaction term *RegConnect 01-07 x ΔIPP 01-07* in

[17] We hand collect bailout funds disbursed to banks in our sample from https://projects.propublica.org/bailout/list.
[18] We exclude the first wave of TARP recipients (Citigroup, JP Morgan, Bank of America and Wells Fargo). Duchin and Sosyura (2012) explain that the size of these institutions ensured that they would have received government funding irrespective of their financial health. Additionally, there is also some anecdotal evidence that these firms were highly encouraged to accept the funds to destigmatize the programme. Regardless, our results are not sensitive to the inclusion of these firms.

Columns 5-6 show evidence (at the 10% and 5% significance level) that connected risk-shifting banks have a higher probability of receiving TARP funds, and receive larger amounts respectively.

In sum, we document that the shareholders of connected banks that engage in risk-shifting are more likely to receive an increase in payouts, have better stock and accounting performance and access to higher TARP funds. This suggests that regulatory connections facilitate a wealth transfer from taxpayers to the shareholders of connected banks.

5. Why are connected banks able to risk-shift?

In this section, we exploit detailed data on the types of connections to investigate why connected banks are able to extract public subsidies from the safety-net. In particular, we test whether two commonly cited reasons in literature can explain our findings: (1) quid-pro-quo behavior, where regulators are unduly lenient to the banks they regulate to secure employment with them in the future (Cohen, 1986; Che, 1995; Dal Bó, 2006; DeHaan, Koh, Kedia and Rajgopoal, 2014; Cornaggia, Cornaggia and Xia, 2015) and (2) knowledge transfer and expertise, where the industry acquires relevant expertise on supervision and enforcement which enables them to better evade it (Che, 1995; Dal Bó, 2006; Lucca, Seru and Trebbi, 2014).

The results of the tests we present below lend support to neither of these interpretations behind risk-shifting by connected banks. We suggest an alternative explanation based on psychological bias induced by social connections or homophily of working experience (Mills and Clark, 1982; Silver, 1990; McPherson, Smith-Lovin and Cook, 2001).

5.1 Quid-pro-quo

We first test if quid-pro-quo arrangements are the reason behind increased subsidies at connected banks. Because regulators have discretion in supervising banks and can choose to rate similar banks differently (Agarwal, Lucca, Seru and Trebbi, 2014), connected banks might use their connections to facilitate the exchange of favors for laxity in supervision (Cohen, 1986; Che, 1995; Dal Bó, 2006; DeHaan, Koh, Kedia, Rajgopoal, 201; Cornaggia, Cornaggia and Xia, 2015).

As quid-pro-quo exchanges are almost impossible to detect empirically (Kane, 2014), we rely on variations in state level measures of corruption and integrity to capture the quality of the institutional environment. Cross-country studies have shown that weaker institutions leave more discretion in the hands of policymakers and more opportunities for corruption (cf. Dinç, 2005, Beck, Demirgüç-Kunt and Levine, 2006; Barth, Lin, Lin and Song, 2009. Should quid-pro-quo be an explanation for why regulators allow risk-shifting at connected banks, we expect to observe more risk-shifting at connected banks in states with worst institutional quality.

< INSERT TABLE 6>

We use two state level variables for our analysis. First, *State Corruption Score* is a normalized score based on a survey by Boylan and Long (2003) of State House reporters in 2003 on the level of corruption in their respective states. Second, *State Integrity Index* is a state level index created from aggregating measures of freedom of information laws, whistle-blower protection laws, campaign finance laws, open meeting laws and conflict of interest laws in 2008 by the Better Government Association. We only use state chartered banks to allow for exposure to state level institutions and regulators in this analysis. State chartered banks are regulated by regulators of their state and either the Fed or FDIC.

The results of our test are displayed in Table 6. The constant term and controls are suppressed for brevity. Columns 1 and 3 control for state level corruption and integrity. Columns 2 and 4 interacts our variable with the state level measures. In all four estimations, we find no evidence that differences in the institutional environment affect risk-shifting brought upon by connections. The coefficient of our variable of interest *RegConnect x* $\Delta\sigma v$ remains positive and statistically significant at 1% in all four columns and none of the interaction terms with institutional quality enter significantly. Therefore, we do not find evidence of risk-shifting being more pronounced in weaker institutional environments. Further, we interpret the result of the triple interaction term as inconsistent with the explanation of connections facilitating quid-pro-quo arrangements which banks exploit to gain access to higher public subsidies. This is consistent with recent studies from Agarwal, Lucca, Seru and Trebbi, (2014) and Lucca, Seru and Trebbi (2014) who do not find evidence of quid-pro-quo behavior being related to regulatory outcomes.

5.2 Knowledge transfer and expertise

Connected directors may possess superior technical knowledge owing to their association with regulators and as a result be able to extract larger public subsidies. Acharya, Schnabl and Suarez (2013) find that banks engage in regulatory arbitrage by moving risks off-balance sheet. Connected directors could simply be more skilled at doing so. Consequently, our findings could arise as a result of connections being correlated to technical expertise. We conduct two tests to show that technical expertise is unlikely to be the main reason behind our findings.

Revolving door vs. public service connections. Our first test relies on the employment histories of the connected directors to identify if directors were previously employed in agencies or serving in agencies as a form of public service. We create two new variables.

RegConnectRevolving is the number of directors who have previously been employed by regulators while *RegConnectPublicService* is the number of directors who are currently serving or have previously served in public service positions. Both measures are scaled by board size.

Revolving door directors have technical expertise which would be valuable to the industry. As we observe in Panel E of Table 1, many of the positions revolving door directors held are in the areas of regulation and enforcement. Subsequently revolving door directors could use these skills to help the bank maximize risk for a required capital level and extract larger subsidies. Crucially, if connections were related to technical expertise, we would not expect public service directors, which have no involvement in supervisory or regulatory matters to be able to access larger public subsidies. Risk-shifting should only be observed the banks with revolving door directors.

< INSERT TABLE 7>

We re-estimate equations (5) and (6) with our new proxies for revolving door and public service connections. Table 7 estimates the effects of these two measures of connectedness with regards to risk-discipline and risk-shifting. Both types of connections—revolving door and public service connections—permit banks to access larger public subsidies. Further, the magnitude of risk-shifting is not statistically different through either type of connection when included in the same regression (Column 5).[19]

While it is plausible that revolving door directors possess technical expertise that facilitates risk-shifting, it is unlikely to be the primary reason behind our observations of risk-shifting at

[19] We perform a *t*-test (null: *RegConnectPublicService x* $\Delta\sigma v$ = *RegConnectRevolving x* $\Delta\sigma v$) in Column 5 to test if both interaction terms are statistically similar. Failure to reject the null (p=0.12) suggests that the effects of both types of connections on risk-shifting are similar.

connected banks. If so, public service positions held by directors on an advisory basis without formal input into supervision and enforcement should not lead to the same level of risk-shifting as revolving door directors.

Who you know vs what you know. Our second test of what drives the risk-shifting of connected banks relies on the idea that while public service directors are not involved in regulation or enforcement, they could still possess expertise that is useful to the financial sector. Public service directors are afforded opportunities to meet with regulators during their terms of service which could facilitate transfers of technical knowledge. Risk-shifting at connected banks could then arise because of transfers of a technical expertise.

The bank regulatory landscape of the US offers a suitable setting to test the relevance of knowledge transfer behind risk-shifting. Although the Fed regulates all BHCs, the charter type of the commercial bank operating under the umbrella of the BHC dictates its federal regulator. Nationally chartered commercial banks are regulated by the OCC. The Fed regulates state chartered banks that are members of the Federal Reserve System while non-member state banks fall under the jurisdiction of the FDIC.

< INSERT TABLE 8 >

Crucially, bank regulations are identical regardless of the regulator responsible (Agarwal, Lucca, Seru and Trebbi, 2014).[20] We therefore conjecture that if connections were related to technical expertise, connections to any bank regulatory body should be associated with risk-

[20] Arguably, regulatory enforcement may differ across agencies. However, there is little evidence of this at a federal level. Agarwal, Lucca, Seru and Trebbi (2014) find differences in enforcement between state and federal regulators but not across federal regulators. They explain that state banking regulators are more lenient to banks when there are concerns over the local economy while federal regulators are harsher as a result of their emphasis on systemic stability. Consistent with this, our results do not show differences in enforcement either. Table 12 of our robustness test shows that federal regulators (the OCC, Fed and FDIC) are similar in their enforcement of regulations.

shifting since regulatory rules are uniform across agencies. For example, in the presence of uniform regulations, banks with Fed connections should be able to extract larger subsidies irrespective of whether they are regulated by the FDIC or the OCC.

We re-run our regression using the number of directors with connections to the Fed divided by board size *RegConnectFed*.[21] We use the number of connections to the Federal Reserve because the Fed is by far (84%) the most common agency which banks have connections to and this allows us variation between different groups of connections. Column 1, 2 and 3 of Table 8 show subsamples of commercial banks that are regulated by the Fed, OCC and FDIC respectively. The interaction term of interest *RegConnectFed x* $\Delta\sigma v$ is positive and significant at the 1% level in Column 1, indicating that commercial banks with connections to the Fed, that are also regulated by the Fed, are able to access larger subsidies from the financial safety-net.[22]

Importantly, the results show that connections to non-relevant regulators do not result in detectable risk-shifting behavior by connected banks. If connections were related to technical expertise, risk-shifting should be observable regardless of the responsible regulator. It is also worth pointing out that the adjusted R^2 in Column 1 is very high (0.79). This further suggests that relevant connections (i.e. connection to the Fed by banks regulated by the Fed) have extremely high explanatory power for risk-shifting incentives.[23]

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[21] We use Fed connections because there are a large number of Fed connections. There are too few FDIC and OCC connections to draw conclusions from.

[22] We would ideally like to show that FDIC/OCC connections should only result in risk-shifting when regulated by the FDIC/OCC but are unfortunately are unable to do so due insufficient connections established with the FDIC/OCC. For instance, we have 0 FDIC connections under FDIC regulated banks

[23] Another advantage of this test is that we can also rule out explanations that directors who are connected are also more talented or possess other unobservable qualities that facilitates risk-shifting. Bond and Glode (2014) theorize that bankers are on average more skillful than regulators and that regulatory agencies lose their best employees to the financial industry. Similarly, Lucca, Seru and Trebbi (2014) show that banking regulators with high levels of human capital spend less time in regulatory bodies before transitioning to the private sector. Subsequently, these

5.3 Discussion

Taken together, our results show that banks have access to higher public subsidies when they are connected to regulators irrespective of how the connections are made (via hiring of ex-regulators or through advisory functions), but only if connections are made to the regulator responsible for a particular bank. Further, we rule out explanations that connections facilitate either quid-pro-quo behavior or the transfer of technical expertise as an explanation behind our results.

Our results suggest an alternative explanation. Collectively, our evidence suggests that connections and relationships established by directors while working for regulatory bodies give rise to a psychological bias. Social bonds between regulators and bankers change the supervisor-supervisee dynamics to a more communal relationship (Mills and Clark, 1982; Silver, 1990) which clouds objective monitoring. In the same vein, various governance studies report that monitoring becomes less effective when CEOs have more social connections to board members (e.g. Hwang and Kim, 2009; Fracassi and Tate, 2012; Khanna, Kim and Lu, 2015).

Crucially, the psychological bias explanation we offer need not rely on direct and personal contact between connected directors and regulators. Throughout our paper, we show that connections allow banks to evade regulatory discipline and increase bank performance even if we measure connections in a way that does not require personal contact between regulators and connected bankers. Under the bias explanation, regulators would simply be aware that connected

directors would then carry with them connections to regulators (our main measure of bank connections) and cause connections to be related to talent or skills.

directors have connections to the agency, and as a result, be more lenient in supervision. Put colloquially, connected regulators might decide to be nicer to friends of friends.[24]

The psychological bias interpretation is consistent with other findings reported in this paper. For instance, we show that risk-shifting increases in the tenure of connected directors. As tenure increases the size of a director's network, the strength of connections and the commonality of experience between directors and regulators. Our interpretation is also consistent with survey evidence provided by Veltrop and De Haan (2014) which shows that Dutch regulators that previously worked for the financial sector were more likely to socially identify with the industry and that this negatively affected their performance on various regulatory tasks. Additionally, Blanes-i-Vidal, Draca and Fons-Rosen (2012) and Bertrand, Bombardini and Trebbi, (2014) show that lobbyist are valued more for their connections to politicians, rather than expertise, consistent with our key findings.

6. Robustness tests

This section explores the robustness of our findings to various alternative explanations.

6.1 Market discipline

The Duan, Moreau and Sealey (1992) framework relates changes in public subsidies to external disciplinary forces. Should market and regulatory forces be sufficient in restraining risk-shifting activities, we should not observe an increase in subsidies when portfolio risk increases. However, it could be that regulatory connections do not lead to a reduction in monitoring by

[24] Another non-mutually exclusive reason could be that regulators who are currently serving in agencies and directors, who have served in these agencies enjoy common experiences which facilitates interaction leading to mutual understanding and trust (Mills and Clark, 1982; Silver, 1990; McPherson, Smith-Lovin and Cook, 2001). This homophily (i.e., affinity for others with similar backgrounds) could also weaken the supposedly independent relationship between regulators and banks by expediting the formation of connections to regulators.

regulators, but by a decrease in discipline by market participants made on the assumption that these banks are more likely to be bailed out when distressed (see for e.g. Duchin and Sosyura, 2012). If so, our results would not be guided by banks with regulatory connections gaining preferential treatment by regulators, but be driven by decreased market discipline.

To investigate and control for the effects of market discipline, we follow the literature and use subordinated debt as a proxy for creditor discipline (Ashcraft, 2008; Schaeck, Cihak, Maechler and Stolz, 2012).[25] We follow Ashcraft (2008) and use the ratio of subordinated debt to the sum of subordinated debt plus Tier1 capital (*Sub Debt*) to proxy for debt-holder discipline. A higher proportion of subordinated debt to capital should be associated with more stringent monitoring of risk. Regression estimates of the disciplinary effects of the change in leverage on risk are presented in Panel A of Table 9 while Panel B show access to public subsidies. Columns 1-3 use the full sample, Columns 4-6 and 7-9 show samples of small and large (assets below and above the median) BHCs respectively. We split our sample by bank size as market discipline at large banks could be ineffective due to implicit bailout guarantees of being too-big-to-fail (Ashcraft, 2008)

<INSERT TABLE 9>

There appears to be some evidence of market disciplinary effects on risk-shifting in small banks (*Sub Deb x* $\Delta\sigma v$ is negative at 5% in Columns 4 and 5). This is consistent with results from Ashcraft (2008) who find disciplinary effects of subordinated debt only in smaller banks.

[25] Other studies make use of debt yields or spreads. Avery, Belton and Goldberg (1988) find no evidence that debt spreads were sensitive to risk using a sample of the largest 100 US BHCs. Flannery and Sorescu (1996) use data from 1983 to 1991 on BHC debenture yields and find that spreads were sensitive to different measures of risk. Bliss and Flannery (2002) study BHCs in the US and find no evidence that bank behaviour responded to stock price changes and conclude that both shareholders and bondholders do not influence managerial action.

However, our main results *RegConnect x* $\Delta\sigma v$ remain robust and significant even after controlling for the effects of market discipline in all regressions. Additionally, creditor discipline does not appear to moderate the effects of risk-shifting driven by regulatory connections from the insignificant coefficients on *RegConnect x Sub Debt x* $\Delta\sigma v$ in most columns. Overall, we find no evidence that our findings are driven by a reduction in market discipline at connected banks.

6.2 Size driven effects

Another interpretation of our results could arise due to size effects being positively related to connectedness. Large banks could enjoy competitive advantages when recruiting directors with regulatory experience or be granted more opportunities to take on public service positions (Adams, 2013).[26] Subsequently, large banks could also be more likely to shift risk onto the safety-net as a result of being too-big-to-fail (Carbo-Valverde, Kane and Rodriguez-Fernandez, 2013). If large banks simultaneous have more access to public subsidies and connections, we may be wrongfully attributing our results to size effects.

< INSERT TABLE 10 >

A number of tests are conducted to investigate if our results are driven by bank size. First, our results remain robust after we exclude the top 5%, 10% and 20% of banks ranked by assets at the end of 2007 in Columns 1-3 of Table 10.[27] Our interaction term of interest remains robust to controlling for risk-shifting incentives of large banks in Columns 4-5. Interestingly, we find in Column 6 that only the largest subset of banks (top 5% of banks) with connections are able to

[26] Adams (2013) find that directors of larger banks are disproportionately more likely to be elected to Federal Reserve directorship positions.

[27] The year of ranking is arbitrarily chosen. Multiple ways of ranking banks by assets are tested and produce similar results.

extract larger subsidies, consistent with moral hazard of being too-big-to-fail.[28] We find no support that our results are driven by connections being related to size.

6.3 Political connections and lobbying

Existing studies focus on various forms of political influence (e.g. lobbying, campaign contributions, connections to politicians) in affecting legislation and bank outcomes (Mian, Sufi and Trebbi, 2010; Igan, Mishra and Tressel, 2011; Duchin and Sosyura, 2012; Acemoglu, Johnson, Kermani, Kwak and Mitton, 2013; Lambert, 2014). As banks could concurrently yield various forms of influence, we control for a banks' lobbying and political connections (*Lobby Dummy, Lobby%, PolConnect* and *TopPolitician*) to assess the validity of our regulatory connections variable. Our results are shown in Table 11.

There is some weak evidence that lobbying activities (*Lobby Dummy x* $\Delta\sigma v$ and *Lobby% x* $\Delta\sigma v$ is significant and positive at the 10% level in Columns 1-2) are associated with higher public subsidies, although this effect disappears entirely when we include *RegConnect x* $\Delta\sigma v$ in Columns 3-4. There is no evidence that political connections and lobbying affect bank risk-shifting (Columns 5-9). Therefore, our results are robust to the inclusion of various measures of political influence.

6.4 Regulatory effects and charter type

The regulatory framework in the US allows banks to select their federal regulator through their choice of bank charter. A body of literature studies the motivations behind the charter choices of banks (Rosen, 2003; 2005; Rezende, 2011; Agarwal, Lucca, Seru and Trebbi, 2014).

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[28] We also interact *RegConnect x* $\Delta\sigma v$ with the Top10% and Top20% dummy but find that the coefficient on the triple interaction term is insignificant.

We control for possible heterogeneity in supervision across federal agencies by controlling for commercial bank charters in Columns 1-2 of Table 12. Further, we also control for Federal Reserve Bank Districts (1-12) that a BHC falls under based on geographical locales in Column 3. Our results remain robust even after controlling for differences in regulatory effects as well as bank charter.

< INSERT TABLE 12>

6.5 Financial crisis

Duchin and Sosyura (2012; 2014) find that politically connected banks are more likely to receive bailout funds in the crisis and subsequently engage in riskier activities. Berger and Roman (Forthcoming) further show that bailed-out banks in the crisis increase both their market-power and market share. Consequently, this infusion of capital to politically connected and non-connected banks could alter bank business strategies and risk policies.

We exclude the crisis years of 2007 to 2008 and carry out main regression for risk-shifting. The results are displayed in Column 1 of Table 13. The interaction *RegConnect x* $\Delta\sigma v$ is still significant and positive, alleviating any concerns that the financial crisis and disbursement of bail-out funds is driving our results.[29]

6.6 Exclusion of worst performing banks

Badly performing banks could be more incentivized to shift risk as they have less to lose when nearing default (Bushman and Williams, 2012). We exclude the bottom 20% worst performing bank years as measured by ROA to test if poorly performing banks are driving our

[29] We also exclude years 2007 to 2009 as well as 2008 to 2009 in unreported regressions and find similar results.

results.[30] The results are displayed in Column 2 of Table 13. The coefficient of *RegConnect x* $\Delta\sigma v$ remains positive and significant showing that our results are not driven by poorly performing banks that have larger incentives to shift risk.

< INSERT TABLE 13>

6.7 BoardEx data start date

Another concern that might arise relates to our sample of banks selected for inclusion in this study. BoardEx began populating data on board executives from 2000 and initially consisted of only the largest firms. It began to reach full capacity in 2003. We re-estimate our main regressions using data starting from 2004 to address any concerns of sample selection. The results are shown in Column 3 of Table 13 and remain consistent and robust.

6.8 Alternate measures of IPP

We re-estimate our main regression using IPP and σv derived from Duan (1994) Maximum likelihood estimations (ML). Estimations of IPP and σv are provided by Carbo-Valverde, Kane and Rodriguez-Fernandez (2013).[31] We match data from their paper to our sample and compare summary statistics. IPP and σv obtained by Duan (1994) ML estimates are 0.13% and 1.4% respectively while we calculate values of 0.2% and 3%. It should be noted that we are interested in the change in IPP with respect to σv and thus exact values of IPP and σv are less important.

The results for our regression using values obtained by ML estimates are reported in Column 4 of Table 13. The coefficient of *RegConnect x* $\Delta\sigma v$ remain robust and significant at the 5% level.

[30] Our results are similar when excluding the bottom 10% or bottom 30% as measured by ROA.

[31] We thank Santiago Carbo, Francisco Fernandez and Ed Kane for sharing their data.

7. Conclusions

This study investigates if connections between regulators and banks allow banks to access larger subsidies from the safety-net. We show that banks with connections to regulators receive preferential treatment in the form of more lax regulatory discipline. We demonstrate that connected banks are required to hold less capital for a given risk increase than non-connected banks. As a result, connected banks are able to shift risk to the financial safety-net thereby extracting public subsidies that allow them to operate with higher leverage and produce more geared returns than non-connected banks. Further, the extraction of larger subsidies at connected banks leads to a wealth transfer from taxpayers to bank shareholders. Risk-shifting at connected banks is associated with a higher probability of payouts, stock and accounting performance and a higher capital allocation under the TARP program in 2008/09.

We also try to elucidate why connected banks are able to risk shift. We find no evidence to support claims that regulators engage in quid-pro-quo behavior with connected banks to secure private benefits or that connected banks possess superior technical skills that they employ to extract subsidies. Our results point to an alternative explanation. We argue that personal ties between regulators and connected banks lead to a psychological bias that undermines effective bank supervision. This bias alters the dynamics of a formal supervisor-supervisee relationship in favor of a more communal relationship which clouds objective monitoring.

Our study draws attention to the darker side of interactions between regulators and senior bankers and suggest that connections between regulators and bankers warrant more scrutiny. Our finding that connected banks can shift risk on the back of connections established through advisory roles—which carry no formal decision-making powers over matters of supervision and enforcement—is particularly notable. First, it suggests that attempts to further limit conflicts of interest between regulators, e.g. by restricting the brief of advisory directors, are unlikely to be effective. Our findings suggest that risk-shifting is driven by personal familiarity (rather than formal influence) and not the decision-making powers of the connected directors. Second, connected banks do not bear sole responsibility for the observed risk-shifting to the financial safety-net we document in this study. Equally, regulators will have to ask themselves why connections undermine the supervisory process even if the connections are not made by hiring ex-regulators.

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Table 1

Descriptive Statistics

This table contains summary statistics for the key variables. Refer to Appendix A for construction and definition of these variables. The sample period is 2001 to 2013. N is the number of bank-year observations, p1 and p99 are the 1st and 99th percentiles. Panel B to D show the nominal number of each type of connection described under description. The total connected bank years in Panels B to D differ as 1 director can hold more than 1 position. Panel B contains the nominal amount of the number of bank years with at least 1 connected director. Panel C describes the number of banks years as defined according to how the connection are made. Panel D presents the number of bank years defined according to the regulatory body in which the connection are made. Panel E lists the positions that connected directors have held in regulatory agencies before joining the bank. Panel F shows the positions as well public service committees that connected directors have or is currently serving in at the regulatory agencies.

Panel A	N	Mean	Median	Std Dev.	p1	p99
Financial Variables						
IPP (%)	3,011	0.285	0.000344	1.131	0	4.456
σv (%)	3,011	3.333	2.849	2.495	0.579	12.20
Lev (B/V %)	3,011	89.80	89.67	6.853	73.16	103.1
V (Million)	3,011	34,207	2,125	195,248	294.7	1273114
Tier 1 Capital	3,011	0.0899	0.0874	0.0269	0.0466	0.151
Bad Loans	3,011	0.0131	0.00747	0.0162	00004	0.0796
ROA (%)	3,011	0.586	0.863	0.0132	-5.69	2.14
Total Deposits	3,011	0.757	0.774	0.0899	0.464	0.898
Log (Total Assets)	3,011	6.480	6.320	0.687	5.460	9.102
Charter Value	3,011	1.464	1.348	0.838	0.146	3.916
Asset Growth	3,011	0.0854	0.0547	0.171	-0.158	0.726
Total Loans	3,011	0.673	0.690	0.123	0.316	0.890
Sub Debt	3,011	0.0399	0	0.0859	0	0.3421
Cash	3,011	0.0432	0.0307	0.0411	0.0075	0.237
Buy-Hold Annual Rets	3,011	-0.0156	0.0161	0.3575	-0.9577	0.8415
Noninterest Income	3,011	0.1827	0.1627	0.1183	-.00623	0.6047
Market Risk	3,011	0.108	0.106	0.175	-0.366	0.529
Payout & TARP Variables						
Net Payout	3,011	11.55	8.85	12.98	-0.03	59.47
Pr(Net Payout ↑) & Net Payout ↑	3,011	0.43	0	0.49	0	1
Pr(TARP)	289	0.564	1	0.497	0	1
TARP%	289	1.3	1.565	1.30	0	5.224
Financial Variables used in Appendix B						
σE (Annualized)	3,011	0.302	0.230	0.225	0.0718	1.297
B (Millions)	3,011	31,110	1,900	182,698	265.5	1157816
E (Millions)	3,011	4,083	270.1	20,632	8.500	120,049
Board Variables						
Board Size	3,011	11.82	11	3.442	6	22
Board Independence	3,011	0.780	0.800	0.120	0.438	0.933
CEO Tenure (Years)	3,011	11.20	9.400	8.243	0.300	34.80
Duality	3,011	0.496	0	0.500	0	1
Bank Structure Variables						
RegbyFED	3,011	0.217	0	0.412	0	1
RegbyFDIC	3,011	0.493	0	0.500	0	1
RegbyOCC	3,011	0.290	0	0.454	0	1
Enforcement Actions	3,011	0.0927	0	0.429	0	2
BHCAge (Years)	3,011	21.61	21	13.01	2	78
Connection Variables						
RegConnect	3,011	0.0347	0	0.0595	0	0.250
RegConnectPublicService	3,011	0.0309	0	0.0553	0	0.250
RegConnectRevolving	3,011	0.00421	0	0.0195	0	0.111
RegConnectTenure (Years)	3,011	2.17	0	4.75	0	23.33
RegConnectFed	3,011	0.0315	0	0.0562	0	0.250
Lobby Dummy	3,011	0.0704	0	0.256	0	1
Lobby%	3,011	0.405	0	1.545	0	8.199
PolConnect	3,011	0.0174	0	0.043	0	0.182
TopPolitician	3,011	0.0088	0	0.284	0	0.143

Description	Total Bank Years (N = 3011)	% of Bank Years (N = 3011)
Panel B		
% by connected bank		
At least 1 connected director	948	31.48
Total connected bank years	948	31.48
Panel C		
% by type of connection		
At least 1 revolving door director	144	4.78
At least 1 public service connected director	881	29.26
Total connected bank years	1025	34.04
Panel D		
% by type regulatory type of connection		
At least 1 Fed connected director	882	29.29
At least 1 FDIC connected director	11	0.37
At least 1 OCC connected director	42	1.39
At least 1 SEC connected director	47	1.56
At least 1 State connected director	61	2.03
Total connected bank years	1043	34.64

Panel E

Revolving Door positions held in sample

Positions

Analyst, Assistant Deputy Comptroller, Division Associate Director, Associate General Counsel, Staff Attorney, FDIC Chairman, Chief Counsel, State Chief Examiner, State Senior Deputy Commissioner, State Commissioner, SEC Commissioner, Comptroller of the Currency, Special Counsel, Agency Division Director, Economist, Deputy Regional Administrator, Bank Examiner, OTS Regional Director, Fed Reserve Bank President, Fed Reserve Bank Senior Vice-President/President

Panel F

Public Service positions held in sample

Regulatory agency	Position	Role Description
Federal Reserve	District Representative	Federal Advisory Council
Federal Reserve	Director	Federal Reserve Bank Board of directors
Federal Reserve	Advisor	New England Advisory Council, Community Depository Institution Advisory Council, Business and Community Advisory Council, Industry Councils Committee, Economic Advisory Council, Small Business and Agriculture Advisory Council, Community Depository Institutions Advisory Council, US Treasury and the Foreign Exchange Committee, International Advisory Committee, Investors Advisory Committee on Financial Markets, Advisory Council Small Business and Agriculture, Community Depository Advisory Council, Community Bank Advisory Council, Small Bank Advisory Council Thrift Institution Advisory Council, Consumer Advisory Council
FDIC	Advisor	Advisory Committee on Economic Inclusion
SEC	Advisor	Market Oversight and Financial Services Advisory Committee, Consumer Affairs Advisory Committee, Advisory Committee on Smaller Public Companies

Table 2

Characteristics of Regulatory Connected Banks

This table reports estimates of panel OLS regressions examining the relationship between the proportion of a bank board that has connections with regulators and their financial characteristics. The dependent variable (*Connect*) is displayed in % and is defined as the number of board members with connections divided by board size. Refer to Appendix A for description of other variables. The sample period is from 2001 to 2013. We estimate the following regression: $RegConnect_{i,t} = \alpha_0 + \sum Controls_{i,t} + \text{Year Dummies} + \varepsilon_{i,t}$, where $\sum$Controls is the vector of variables in each column. Bank fixed-effects are used in Column 1-2. A random-effects model is used in columns 3-4. Columns 5-6 are the estimations for the IV-First Stage. All dependent variables in Columns 2 and 4 are lagged. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	Fixed Effects		Random Effects		IV-1st Stage (OLS)	
	(1)	(2)	(3)	(4)	(5)	(6)
	RegConnect%	RegConnect%	RegConnect%	RegConnect%	RegConnect%	RegConnect% x Δσv Δσv
σv	0.028	0.029	0.036	0.038		
	[0.030]	[0.045]	[0.031]	[0.047]		
Δσv					0.03	-2.157
					[0.101]	[1.336]
BHC Age			0.069*	0.072*	0.065***	0.034
			[0.037]	[0.040]	[0.014]	[0.073]
BHC Age x Δσv					-0.001	0.300***
					[0.005]	[0.051]
Tier1 Capital	-6.15	1.206	-4.573	0.705	1.291	-13.428
	[5.886]	[6.566]	[4.540]	[4.693]	[3.284]	[19.438]
Bad Loans	-12.151*	-12.458	-13.273**	-14.051	-31.340***	-14.071
	[6.749]	[9.549]	[6.667]	[9.434]	[7.953]	[34.034]
Lag Enforcement Actions	-0.02	-0.199	-0.004	-0.147	0.407*	0.878
	[0.138]	[0.219]	[0.138]	[0.220]	[0.241]	[1.182]
ROA	-4.761	-0.518	-5.225	-0.205	-4.777	15.892
	[6.599]	[7.470]	[6.527]	[7.516]	[9.913]	[61.853]
Total Deposits	-1.496	2.237	-1.695	1.522	0.572	2.843
	[2.873]	[3.041]	[2.340]	[2.455]	[1.338]	[4.454]
Total Assets	2.678	2.628	2.512***	2.676***	2.850***	-0.726
	[1.868]	[1.985]	[0.669]	[0.683]	[0.269]	[1.305]
Charter Value	-0.439*	-0.612**	-0.422*	-0.557**	0.037	-0.618
	[0.237]	[0.291]	[0.220]	[0.265]	[0.161]	[0.605]
Asset Growth	0.012	0.136	0.155	0.079	0.324	0.588
	[0.438]	[0.435]	[0.377]	[0.389]	[0.704]	[1.747]
Total Loans	4.389**	4.253*	3.233*	2.453	-0.29	-0.023
	[2.065]	[2.268]	[1.697]	[1.799]	[0.971]	[2.610]
Market Risk	2.704**	3.708***	2.406**	3.264***	0.506	1.764
	[1.064]	[1.135]	[0.954]	[1.020]	[0.609]	[1.985]
Board Size	-0.069	-0.047	-0.093	-0.071	-0.152***	-0.087
	[0.080]	[0.082]	[0.068]	[0.070]	[0.031]	[0.090]
Board Independence	0.096	0.682	-0.034	0.56	0.055	0.76
	[1.751]	[1.699]	[1.496]	[1.437]	[0.842]	[2.420]
CEO Tenure	-0.02	-0.029	-0.013	-0.018	0.031**	-0.011
	[0.024]	[0.031]	[0.022]	[0.027]	[0.015]	[0.047]
Duality	0.049	0.275	0.121	0.314	0.21	0.241
	[0.372]	[0.431]	[0.324]	[0.371]	[0.229]	[0.846]
Constant	-12.728	-16.668	-12.487**	-17.116***	-15.693***	8.499
	[13.380]	[14.500]	[4.930]	[5.086]	[2.374]	[11.305]
Observations	3,011	2,539	3,011	2,539	3,011	3,011
Adj. R-squared	0.0993	0.0955	0.1677	0.167	0.181	0.595
Number of banks	448	411	448	411	448	448
Controls lagged	NO	YES	NO	YES	NO	NO
Bank Fixed Effects	YES	YES	YES	YES	NO	NO
Year Fixed Effects	YES	YES	YES	YES	YES	YES

Table 3

Risk-Discipline and Regulatory Connections; Sensitivity of ΔLev to Δσv

This table reports estimates of the modified first equation (Equation 5) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in leverage (B/V) to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. We estimate the following regression: $\Delta(Lev)_{i,t} = \alpha_0 + \alpha_1 \Delta\sigma_{Vi,t} + \alpha_2 \Delta RegConnect_{i,t} + \alpha_3(\Delta\sigma_{Vi,t} * RegConnect_{i,t}) + \sum Controls$ +Year Dummies + $\varepsilon_{i,t}$ where ∑Controls is the vector of variables in each column. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	OLS-FE (1) ΔLev	OLS-FE (2) ΔLev	OLS-FE (3) ΔLev	POLS (4) ΔLev	OLS-FE (5) ΔLev
RegConnect x Δσv		2.301***	2.077***	2.314***	
		[0.767]	[0.738]	[0.796]	
RegConnect		0.372	-2.814	0.123	
		[2.514]	[2.201]	[0.807]	
RegConnectTenure x Δσv					0.015***
					[0.005]
RegConnectTenure					-0.056*
					[0.031]
Δσv	-0.016	-0.15	-0.097	-0.176	-0.048
	[0.084]	[0.113]	[0.102]	[0.117]	[0.085]
Tier1 Capital			-36.139***	-11.343	-36.835***
			[5.468]	[10.189]	[5.385]
Bad Loans			11.036	14.856*	11.1
			[8.654]	[7.567]	[8.699]
Lag Enforcement Actions			0.21	0.398**	0.196
			[0.165]	[0.163]	[0.163]
ROA			-23.503*	-29.018***	-22.818*
			[12.055]	[11.136]	[11.625]
Total Deposits			-0.485	0.02	-0.342
			[1.664]	[0.742]	[1.685]
Total Assets			3.957***	0.220*	3.859***
			[0.995]	[0.120]	[0.997]
Charter Value			-1.952***	-0.710***	-2.017***
			[0.279]	[0.134]	[0.279]
Asset Growth			3.018***	3.356***	3.013***
			[0.434]	[0.490]	[0.440]
Total Loans			4.497***	0.485	4.424***
			[1.252]	[0.596]	[1.238]
Market Risk			-0.979	-0.153	-0.962
			[0.694]	[0.328]	[0.695]
Board Size			-0.024	-0.002	-0.016
			[0.039]	[0.016]	[0.040]
Board Independence			-1.512	0.518	-1.649
			[1.021]	[0.543]	[1.016]
CEO Tenure			0.039***	0.015**	0.041***
			[0.015]	[0.007]	[0.015]
Duality			0.307	0.154	0.262
			[0.225]	[0.120]	[0.242]
Constant	-3.028***	-3.050***	-24.593***	-2.596**	-23.809***
	[0.182]	[0.215]	[7.239]	[1.304]	[7.333]
Observations	3,011	3,011	3,011	3,011	3,011
Adj. R-squared	0.355	0.382	0.503	0.449	0.495
Number of banks	448	448	448	448	448
Bank Fixed Effects	YES	YES	YES	NO	YES
Year Fixed Effects	YES	YES	YES	YES	YES

Table 4

Risk-Shifting and Regulatory Connections: Sensitivity of ΔIPP to Δσv

This table reports estimates of the modified second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS/2SLS/Heckman (1979) regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. We estimate the following regression: $\Delta IPP_{i,t} = \beta_0 + \beta_1 \Delta\sigma_{Vi,t} + \beta_2 \Delta RegConnect_{i,t} + \beta_3(\Delta\sigma_{Vi,t} * RegConnect_{i,t}) + \sum Controls_i +$ Year Dummies $+ \varepsilon_{i,t}$ where $\sum$Controls is the vector of variables in each column. Column 6 is the 2SLS second-stage equation. The first-stage results are shown in Columns 5-6 of Table 2. Column 8 is the Heckman (1979) second-stage equation. The selection equation is a Probit regression with independent variables following Column 3 of Table 2 with dependent variable = 1 if a bank is connected and 0 if otherwise Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	OLS-FE	OLS-FE	OLS-FE	OLS-FE	POLS	IV-2nd Stage	If Connect>0	Heckman (1979)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP
RegConnect x Δσv		1.124***	1.111***		1.144***	1.855***	2.319***	2.320***
		[0.378]	[0.370]		[0.376]	[0.211]	[0.288]	[0.284]
RegConnect		-0.261	-0.573		-0.023	1.163	-0.275	-0.274
		[0.627]	[0.643]		[0.236]	[2.587]	[1.030]	[1.013]
RegConnectTenure x Δσv				0.008***				
				[0.0027]				
RegConnectTenure				-0.006				
				[0.009]				
Δσv	0.322***	0.257***	0.262***	0.287***	0.248***	0.208***	0.023	0.023
	[0.040]	[0.050]	[0.048]	[0.040]	[0.050]	[0.035]	[0.063]	[0.063]
Tier1 Capital			-2.297	-2.539	0.341	0.343	-2.132	-2.117
			[2.351]	[2.287]	[1.324]	[1.162]	[2.690]	[2.639]
Bad Loans			11.538***	11.446***	7.964***	8.301***	16.445*	16.446*
			[2.702]	[2.688]	[1.919]	[2.218]	[9.933]	[9.760]
Lag Enforcement Actions			0.229***	0.225***	0.266***	0.270***	0.141	0.141
			[0.070]	[0.072]	[0.065]	[0.066]	[0.099]	[0.097]
ROA			-6.563	-6.328	-7.330**	-7.435**	-6.037	-6.039
			[4.456]	[4.373]	[3.625]	[3.740]	[5.885]	[5.785]
Total Deposits			0.063	0.156	0.024	-0.011	-0.506	-0.503
			[0.469]	[0.505]	[0.139]	[0.190]	[0.672]	[0.659]
Total Assets			0.856***	0.734***	0.018	-0.015	0.461	0.462
			[0.232]	[0.235]	[0.023]	[0.097]	[0.515]	[0.505]
Charter Value			-0.189***	-0.217***	-0.046	-0.035	-0.231***	-0.231***
			[0.058]	[0.060]	[0.031]	[0.032]	[0.083]	[0.081]
Asset Growth			0.133	0.113	0.219***	0.211**	0.243	0.243
			[0.087]	[0.089]	[0.074]	[0.090]	[0.176]	[0.173]
Total Loans			0.374	0.35	-0.034	-0.015	0.547	0.542
			[0.308]	[0.306]	[0.099]	[0.119]	[0.546]	[0.537]
Market Risk			-0.076	-0.067	-0.047	-0.059	0.034	0.032
			[0.189]	[0.185]	[0.069]	[0.084]	[0.233]	[0.230]
Board Size				0.015	0.005	0.007	-0.01	-0.01
				[0.010]	[0.003]	[0.006]	[0.014]	[0.014]
Board Independence				-0.352	0.072	0.058	-0.515	-0.516
				[0.266]	[0.099]	[0.129]	[0.566]	[0.556]
CEO Tenure				0.006	0.003**	0.003	0.006	0.006
				[0.005]	[0.002]	[0.003]	[0.005]	[0.005]
Duality				0.130*	0.048*	0.039	0.157	0.157
				[0.076]	[0.024]	[0.036]	[0.131]	[0.129]
Lambda								-0.0169
								0.051
Constant	-0.232***	-0.222***	-5.796***	-5.017***	-0.254	0.463	-2.592	-1.283
	[0.052]	[0.056]	[1.708]	[1.732]	[0.247]	[0.598]	[3.880]	[3.712]
Observations	3,011	3,011	3,011	3,011	3,011	3,011	948	948
Adj. R-squared	0.55	0.601	0.643	0.624	0.619	0.597	0.784	
Number of banks	448	448	448	448	448	448	156	156
Bank Fixed Effects	YES	YES	YES	YES	NO	NO	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Table 5

Regulatory Connections, Risk-shifting, Bank Payouts, Performance and TARP Funds

This table reports estimates of the panel OLS and logit regressions examining the relationship between connected banks, risk-shifting, payout and performance. Total Net Payout is defined as Common Dividends paid out in the year + Net Repurchases (Treasury stock purchase – sales). Net Payout ↑ and Pr (Total Net Payout ↑) are binary variables that = 1 if the change in the Net Payout increases from the previous year. Buy-Hold Annual rets are calculated using annualized monthly log buy-hold returns. ROA is defined as Income before extraordinary items divided by total assets. Refer to Appendix A for description of variables. Column 3 reports odds ratios from a conditional logit model. Columns 1-3 run regressions for which Net Payout is not 0. The sample period is from 2001 to 2013. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	OLS-FE (1) Total Net Payout↑	Logit (2) Pr(Total Net Payout↑)	OLS-FE (3) BH Annual Rets	OLS-FE (4) ROA%	Logit (5) Pr(TARP)	POLS (6) TARP %
RegConnect x ΔIPP	0.100**	1.006*	0.078**	0.442**		
	[0.044]	[0.004]	[0.039]	[0.206]		
RegConnect 01-07 x ΔIPP 01-07					41.697*	1.530**
					[91.672]	[0.670]
RegConnect	0.359	1.013	-0.147	0.251		
	[0.360]	[0.018]	[0.244]	[0.800]		
ΔIPP	-0.014	0.874	-0.031***	-0.144**		
	[0.014]	[0.082]	[0.011]	[0.062]		
Δσv	-0.014**	0.941**	0.007**	0.024*		
	[0.006]	[0.026]	[0.003]	[0.013]		
RegConnect 01-07					1.015	-0.003
					[0.031]	[0.015]
ΔIPP 01-07					0.003	-3.518
					[0.033]	[4.060]
Δσv 01-07					0.794	-0.149
					[0.183]	[0.119]
Tier1 Capital	0.667	0.99	2.195***	5.284	0.648***	-0.158***
	[1.035]	[0.049]	[0.653]	[3.444]	[0.072]	[0.052]
Total Assets	0.280**	4.456**	-0.558***	-1.010**	3.251***	0.498***
	[0.138]	[3.093]	[0.098]	[0.442]	[1.269]	[0.176]
Total Deposits	0.161	1.007	0.06	1.132	1.015	0.011
	[0.274]	[0.013]	[0.182]	[0.882]	[0.021]	[0.010]
Charter Value	0.049	1.001	-0.016	0.337**		
	[0.044]	[0.002]	[0.025]	[0.165]		
Cash	0.077	1.003	-0.312	-0.15		
	[0.322]	[0.014]	[0.308]	[1.022]		
Asset Growth	-0.584***	0.959***	0.031	0.11		
	[0.128]	[0.005]	[0.034]	[0.377]		
Leverage	0.001	0.986	0.023***	-0.009		
	[0.006]	[0.030]	[0.004]	[0.025]		
Board Size	0.004	1.011	-0.002	-0.005	1	0
	[0.006]	[0.025]	[0.003]	[0.013]	[0.001]	[0.000]
Board Independence	0.112	1.373	-0.09	-0.319	1.025*	0.01
	[0.171]	[1.116]	[0.104]	[0.381]	[0.014]	[0.008]
Duality	0.051	1.304	0.003	-0.071	1.104	-0.141
	[0.047]	[0.286]	[0.032]	[0.090]	[0.365]	[0.178]
CEO Tenure	-0.001	0.996	0	-0.010*	0.985	-0.006
	[0.002]	[0.012]	[0.002]	[0.005]	[0.018]	[0.010]
Lag Enforcement Actions	-0.019	0.883	-0.044**	-0.244**	0.387***	-0.326***
	[0.021]	[0.093]	[0.018]	[0.096]	[0.096]	[0.078]
ROA	0.799	1.053			0.98	0.024
	[1.479]	[0.082]			[0.087]	[0.043]
Market Risk					1.001	0.005
					[0.009]	[0.005]
Bad Loans			-6.451***	-26.520***	1.151	0.078
			[0.842]	[3.588]	[0.153]	[0.073]
Total Loans			-0.329**	-0.602		
			[0.154]	[0.545]		
Noninterest Income			0.320***	0.529		
			[0.118]	[0.369]		
Constant	-1.693		2.098**	7.755*	0.002*	-1.955
	[1.272]		[0.907]	[4.681]	[0.006]	[1.702]
Observations	2,639	2,491	2,539	2,539	271	271
Pseudo/ Adj. R-squared	0.134	0.153	0.494	0.368	0.169	0.0914
Number of banks	422	341	411	411	271	271
Controls lagged	NO	NO	YES	YES	2008Q3	2008Q3
Bank Fixed Effects	YES	YES	YES	YES	NO	NO
Year Fixed Effects	YES	YES	YES	YES	NO	NO

Table 6

Regulatory Connections and Quid-Pro-Quo

This table reports estimates of the first (Equation 5) and second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the leverage and deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. We estimate the following regression: $\Delta IPP_{i,t} = \beta_0 + \beta_1 \Delta\sigma_{Vi,t} + \beta_2 \Delta RegConnect_{i,t} + \beta_3(\Delta\sigma_{Vi,t} * RegConnect_{i,t}) + \sum Controls_i +$ Year Dummies $+ \varepsilon_{i,t}$ where $\sum$Controls is the vector of variables in each column. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	(1) ΔLev	(2) ΔLev	(3) ΔLev	(4) ΔLev	(5) ΔIPP	(6) ΔIPP	(7) ΔIPP	(8) ΔIPP
RegConnect x Δσv	2.843***	2.779***	3.026***	14.257**	1.451***	1.445***	1.512***	6.995**
	[0.520]	[0.503]	[0.587]	[6.851]	[0.268]	[0.261]	[0.280]	[3.508]
State Corruption Score x Δσv	0.099	0.053			0.049	0.045		
	[0.129]	[0.182]			[0.073]	[0.106]		
RegConnect x State Corruption Score x Δσv		0.764				0.064		
		[1.092]				[0.650]		
State Integrity Index x Δσv			0.231	0.383			0.05	0.125
			[0.222]	[0.279]			[0.105]	[0.135]
RegConnect x State Integrity Index x Δσv				-4.586				-2.239
				[2.830]				[1.455]
RegConnect	1.49	3.14	0.108	-20.962	0.987	1.487	0.811	-8.532
	[3.053]	[3.443]	[2.916]	[24.468]	[0.812]	[1.033]	[0.721]	[8.660]
Δσv	-0.199**	-0.197**	-0.81	-1.185	0.224***	0.224***	0.088	-0.095
	[0.084]	[0.081]	[0.599]	[0.740]	[0.042]	[0.042]	[0.279]	[0.353]
State Corruption Score	-9.828**	-10.397***			-0.045	-0.217		
	[3.916]	[3.400]			[1.094]	[0.961]		
RegConnect x State Corruption Score		-5.109				-1.688		
		[6.175]				[1.535]		
State Integrity Index			-3.197	-3.958*			0.184	-0.156
			[2.604]	[2.183]			[0.537]	[0.442]
RegConnect x State Integrity Index				7.926				3.512
				[8.976]				[3.368]
Observations	1,931	1,931	2,110	2,110	1,931	1,931	2,110	2,110
Adj. R-squared	0.537	0.538	0.532	0.536	0.693	0.693	0.682	0.689
Number of banks	298	298	327	327	298	298	327	327
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES

Table 7

Public Service, Revolving Doors, Risk-Discipline and Shifting

Column 1-2 and 3-5 of this table reports estimates of the first (Equation 5) and second (Equation 6) equations of the Duan et al. (1992) framework using panel OLS regressions respectively. It examines the sensitivity of changes in the leverage and deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	(1) ΔLev	(2) ΔLev	(3) ΔIPP	(4) ΔIPP	(5) ΔIPP
RegConnectPublicService x Δσv	2.060*		1.190**		0.710*
	[1.160]		[0.570]		[0.416]
RegConnectPublicService	-0.093		-0.191		-0.28
	[2.172]		[0.656]		[0.622]
RegConnectRevolving x Δσv		4.947***		2.397***	1.888***
		[1.582]		[0.876]	[0.646]
RegConnectRevolving		-12.344***		-1.424	-1.116
		[4.737]		[2.172]	[1.864]
Δσv	-0.059	-0.067	0.279***	0.282***	0.263***
	[0.089]	[0.084]	[0.043]	[0.038]	[0.048]
Tier1 Capital	-36.496***	-36.337***	-2.422	-2.382	-2.186
	[5.374]	[5.381]	[2.322]	[2.284]	[2.310]
Bad Loans	11.425	10.732	11.657***	11.526***	11.557***
	[8.712]	[8.629]	[2.676]	[2.671]	[2.661]
Lag Enforcement Actions	0.211	0.167	0.233***	0.212***	0.226***
	[0.162]	[0.167]	[0.069]	[0.073]	[0.072]
ROA	-22.655*	-23.889**	-6.092	-6.689	-6.66
	[12.089]	[11.456]	[4.418]	[4.317]	[4.425]
Total Deposits	-0.523	-0.123	0.08	0.293	0.181
	[1.690]	[1.632]	[0.470]	[0.487]	[0.467]
Total Assets	3.854***	3.941***	0.740***	0.776***	0.776***
	[1.001]	[0.964]	[0.235]	[0.226]	[0.230]
Charter Value	-1.955***	-2.034***	-0.196***	-0.226***	-0.203***
	[0.278]	[0.273]	[0.056]	[0.058]	[0.059]
Asset Growth	2.998***	3.067***	0.094	0.129	0.118
	[0.433]	[0.439]	[0.089]	[0.088]	[0.087]
Total Loans	4.229***	4.571***	0.299	0.439	0.425
	[1.288]	[1.227]	[0.309]	[0.308]	[0.296]
Market Risk	-1.118	-0.947	-0.127	-0.039	-0.058
	[0.697]	[0.704]	[0.176]	[0.191]	[0.183]
Board Size	-0.019	-0.032	0.016	0.01	0.012
	[0.040]	[0.037]	[0.011]	[0.009]	[0.010]
Board Independence	-1.411	-1.774*	-0.234	-0.393	-0.343
	[1.058]	[1.001]	[0.274]	[0.272]	[0.272]
CEO Tenure	0.040***	0.038**	0.006	0.005	0.005
	[0.015]	[0.015]	[0.005]	[0.005]	[0.005]
Duality	0.312	0.248	0.156**	0.144*	0.144**
	[0.225]	[0.232]	[0.075]	[0.075]	[0.072]
Constant	-23.933***	-24.377***	-5.111***	-5.374***	-5.379***
	[7.286]	[7.081]	[1.691]	[1.656]	[1.672]
Observations	3,011	3,011	3,011	3,011	3,011
Adj. R-squared	0.492	0.507	0.626	0.64	0.649
Number of banks	448	448	448	448	448
Bank Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES

Table 8

Regulatory Connections and Transfer of Knowledge

This table reports estimates of the second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. Column 1, 2 and 3 show subsample analysis of the main commercial bank under the BHC by their main federal regulator as determined by charter type. Banks in Column 1, 2 and 3 are regulated by the Fed, OCC and FDIC respectively. Column 4 uses the full sample of BHCs. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	Reg by Fed	Regby OCC	Reg by FDIC	All BHCs
	(1)	(2)	(3)	(4)
	ΔIPP	ΔIPP	ΔIPP	ΔIPP
RegConnectFed x Δσv	2.180***	-0.27	0.691	1.132*
	[0.288]	[0.658]	[0.523]	[0.584]
RegConnectFed	1.800*	-1.668**	0.447	-0.372
	[1.011]	[0.804]	[1.170]	[0.604]
Δσv	0.261***	0.326***	0.233***	0.278***
	[0.043]	[0.068]	[0.054]	[0.045]
Tier1 Capital	-0.223	-1.25	-4.600*	-2.411
	[4.021]	[3.868]	[2.337]	[2.324]
Bad Loans	8.641*	9.829***	13.196***	12.047***
	[4.693]	[3.445]	[3.680]	[2.778]
Lag Enforcement Actions	0.417***	-0.008	0.282**	0.233***
	[0.153]	[0.063]	[0.123]	[0.070]
ROA	-15.364	-12.348	-0.51	-6.1
	[10.493]	[8.913]	[5.173]	[4.415]
Total Deposits	-0.149	-0.159	1.02	0.112
	[0.895]	[0.797]	[0.639]	[0.471]
Total Assets	0.930*	0.156	1.232***	0.748***
	[0.489]	[0.582]	[0.251]	[0.234]
Charter Value	-0.101	-0.283**	-0.254***	-0.197***
	[0.098]	[0.112]	[0.072]	[0.057]
Asset Growth	0.271*	-0.077	0.104	0.101
	[0.151]	[0.235]	[0.129]	[0.089]
Total Loans	0.918	0.149	0.613	0.347
	[0.819]	[0.556]	[0.413]	[0.314]
Board Size	0.021	-0.01	0.030**	0.015
	[0.025]	[0.019]	[0.014]	[0.011]
Board Independence	-1.010*	-0.013	-0.32	-0.241
	[0.576]	[0.433]	[0.385]	[0.273]
CEO Tenure	-0.001	0.007	0.009	0.005
	[0.007]	[0.007]	[0.008]	[0.005]
Duality	0.022	0.12	0.227**	0.163**
	[0.203]	[0.114]	[0.109]	[0.077]
Market Risk	0.468	-0.36	-0.056	-0.085
	[0.406]	[0.389]	[0.253]	[0.180]
Constant	-6.532*	-0.599	-8.973***	-5.208***
	[3.546]	[4.388]	[1.968]	[1.688]
Observations	652	874	1,485	3,011
Adj. R-squared	0.797	0.646	0.501	0.624
Number of banks	107	129	246	448
Bank Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES

Table 9

Market Discipline and Regulatory Connections

Panel A and B of this table reports estimates of the first (Equation 5) and second (Equation 6) equations of the Duan et al. (1992) framework using panel OLS regressions respectively. It examines the sensitivity of changes in leverage and the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. Columns 1-3 show the full sample of BHCs. Columns 4-6 show the sample of small BHCs with assets below the median while Columns 7-9 uses large BHCs with assets above the median. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

Panel A	All BHCs	All BHCs	All BHCs	Small BHCs	Small BHCs	Small BHCs	Large BHCs	Large BHCs	Large BHCs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLev	ΔLev	ΔLev	ΔLev	ΔLev	ΔLev	ΔLev	ΔLev	ΔLev
RegConnect x $\Delta\sigma v$		2.027***	2.248***		2.705**	2.721**		1.430*	1.745**
		[0.770]	[0.779]		[1.073]	[1.078]		[0.759]	[0.855]
RegConnect		-2.787	-2.973		-2.211	-2.179		-1.57	-1.696
		[2.131]	[2.060]		[4.286]	[4.272]		[2.314]	[2.260]
Sub Debt x $\Delta\sigma v$	0.86	0.351	1.005	-3.508*	-3.209*	-2.875	0.784	0.345	0.927
	[0.867]	[0.605]	[0.749]	[1.830]	[1.702]	[2.270]	[0.789]	[0.598]	[0.792]
Sub Debt	0.317	0.697	0.768	6.217	6.235	6.378	-2.56	-2.128	-2.115
	[2.729]	[2.646]	[2.672]	[5.105]	[5.007]	[5.041]	[2.225]	[2.219]	[2.169]
$\Delta\sigma v$	-0.008	-0.108	-0.124	-0.099	-0.230*	-0.231*	0.045	-0.014	-0.034
	[0.095]	[0.106]	[0.107]	[0.147]	[0.133]	[0.134]	[0.083]	[0.115]	[0.123]
RegConnect x Sub Debt x $\Delta\sigma v$			-6.343			-9.576			-5.781
			[7.968]			[23.671]			[7.806]
Observations	3,011	3,011	3,011	1,506	1,506	1,506	1,505	1,505	1,505
Adj. R-squared	0.483	0.503	0.504	0.493	0.517	0.516	0.51	0.521	0.522
Number of banks	448	448	448	317	317	317	209	209	209
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel B	All BHCs	All BHCs	All BHCs	Small BHCs	Small BHCs	Small BHCs	Large BHCs	Large BHCs	Large BHCs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP
RegConnect x $\Delta\sigma v$		1.090***	1.198***		1.421***	1.441***		0.815**	0.942**
		[0.387]	[0.391]		[0.528]	[0.524]		[0.383]	[0.429]
RegConnect		-0.492	-0.583		-0.76	-0.72		-0.207	-0.258
		[0.623]	[0.602]		[1.299]	[1.302]		[0.623]	[0.605]
Sub Debt x $\Delta\sigma v$	0.405	0.137	0.456	-1.460**	-1.305**	-0.876	0.469	0.223	0.46
	[0.449]	[0.304]	[0.377]	[0.630]	[0.571]	[0.667]	[0.401]	[0.296]	[0.389]
Sub Debt	0.058	0.21	0.244	0.429	0.438	0.623	0.369	0.557	0.562
	[0.639]	[0.655]	[0.625]	[0.566]	[0.556]	[0.564]	[0.691]	[0.764]	[0.708]
$\Delta\sigma v$	0.312***	0.258***	0.250***	0.266***	0.197***	0.195***	0.327***	0.293***	0.285***
	[0.047]	[0.050]	[0.051]	[0.074]	[0.067]	[0.068]	[0.038]	[0.054]	[0.057]
RegConnect x Sub Debt x $\Delta\sigma v$			-3.096			-12.315*			-2.349
			[3.886]			[6.497]			[3.791]
Observations	3,011	3,011	3,011	1,506	1,506	1,506	1,505	1,505	1,505
Adj. R-squared	0.599	0.645	0.647	0.398	0.477	0.478	0.694	0.716	0.717
Number of banks	448	448	448	317	317	317	209	209	209
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 10

Too-Big-To-Fail and Regulatory Connections

This table reports estimates of the second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. Columns 1-3 excludes banks with the top 5%, 10% and 20% assets as at end of 2007. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	Excl. Top 5% Assets	Excl. Top 10% Assets	Excl. Top 20% Assets	Ctrl Top 5% Assets	Ctrl Top 10% Assets	Top5% & Connect
	(1)	(2)	(3)	(4)	(5)	(6)
	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP	ΔIPP
RegConnect x Δσv	1.002**	1.025**	1.361***	1.076***	1.054**	0.987**
	[0.434]	[0.449]	[0.366]	[0.403]	[0.411]	[0.464]
RegConnect	-1.147	-0.889	-1.084	-0.485	-0.459	-0.163
	[0.756]	[0.825]	[0.849]	[0.623]	[0.613]	[0.627]
Top5%Asset x Δσv				0.032		-0.195***
				[0.073]		[0.065]
Top10%Asset x Δσv					0.051	
					[0.069]	
RegConnect x Top5%Asset x Δσv						1.510**
						[0.631]
RegConnect x Top10%Asset x Δσv						
Δσv	0.275***	0.269***	0.210***	0.261***	0.258***	0.265***
	[0.047]	[0.050]	[0.043]	[0.049]	[0.051]	[0.049]
Tier1 Capital	-5.197**	-5.009**	-3.560*	-2.192	-2.266	-2.152
	[2.079]	[2.117]	[2.041]	[2.335]	[2.323]	[2.322]
Bad Loans	10.025***	10.748***	12.116***	11.546***	11.538***	11.321***
	[2.590]	[2.678]	[2.716]	[2.660]	[2.666]	[2.629]
Lag Enforcement Actions	0.274***	0.287***	0.230**	0.235***	0.240***	0.224***
	[0.090]	[0.098]	[0.102]	[0.071]	[0.070]	[0.070]
ROA	-5.955	-4.461	-5.883	-6.536	-6.324	-6.483
	[4.723]	[4.696]	[5.417]	[4.465]	[4.381]	[4.440]
Total Deposits	0.563	0.595	0.695	0.103	0.086	0.184
	[0.483]	[0.505]	[0.543]	[0.463]	[0.465]	[0.462]
Total Assets	1.021***	0.960***	0.881***	0.760***	0.757***	0.736***
	[0.233]	[0.243]	[0.293]	[0.235]	[0.235]	[0.238]
Charter Value	-0.230***	-0.242***	-0.195***	-0.189***	-0.183***	-0.207***
	[0.068]	[0.075]	[0.062]	[0.062]	[0.063]	[0.059]
Asset Growth	0.098	0.079	0.087	0.108	0.111	0.103
	[0.093]	[0.096]	[0.086]	[0.088]	[0.088]	[0.088]
Total Loans	0.643**	0.822**	0.670**	0.399	0.402	0.375
	[0.326]	[0.327]	[0.333]	[0.301]	[0.301]	[0.301]
Market Risk	-0.068	-0.077	0.008	-0.082	-0.084	-0.101
	[0.206]	[0.215]	[0.221]	[0.183]	[0.183]	[0.183]
Board Size	0.016	0.022*	0.029**	0.014	0.015	0.011
	[0.011]	[0.012]	[0.012]	[0.010]	[0.010]	[0.010]
Board Independence	-0.458	-0.415	-0.317	-0.3	-0.304	-0.316
	[0.286]	[0.302]	[0.319]	[0.268]	[0.267]	[0.268]
CEO Tenure	0.008	0.008	0.008	0.005	0.006	0.005
	[0.006]	[0.006]	[0.007]	[0.005]	[0.005]	[0.005]
Duality	0.1	0.102	0.073	0.146**	0.139*	0.151**
	[0.075]	[0.083]	[0.090]	[0.071]	[0.072]	[0.071]
Constant	-6.982***	-6.800***	-6.501***	-5.269***	-5.240***	-5.096***
	[1.686]	[1.759]	[2.101]	[1.696]	[1.698]	[1.719]
Observations	2,484	2,302	1,975	3,011	3,011	3,011
Adj. R-squared	0.636	0.639	0.61	0.645	0.646	0.649
Number of banks	300	284	252	448	448	448
Bank Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES

Table 11

Political Connections and Lobbying

This table reports estimates of the second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	(1) ΔIPP	(2) ΔIPP	(3) ΔIPP	(4) ΔIPP	(5) ΔIPP	(6) ΔIPP	(7) ΔIPP	(8) ΔIPP	(9) ΔIPP
RegConnect x Δσv			1.035**	1.049**			1.125***	1.112***	1.044***
			[0.420]	[0.412]			[0.344]	[0.361]	[0.389]
RegConnect			-0.436	-0.467			-0.55	-0.473	-0.467
			[0.602]	[0.606]			[0.623]	[0.643]	[0.584]
Lobby Dummy x Δσv	0.166*		0.074						
	[0.090]		[0.082]						
Lobby Dummy	0.135		0.140*						
	[0.084]		[0.080]						
Lobby% x Δσv		0.025*		0.01					0.014
		[0.015]		[0.013]					[0.012]
Lobby%		0.028		0.030*					0.03
		[0.019]		[0.018]					[0.019]
PolConnect x Δσv					-0.339		-0.46		-0.58
					[0.463]		[0.435]		[0.433]
PolConnect					0.169		0.189		0.077
					[0.931]		[0.915]		[0.892]
TopPolitician x Δσv						-0.938		-0.978	
						[0.705]		[0.714]	
TopPolitician						0.766		0.65	
						[0.923]		[0.851]	
Δσv	0.309***	0.311***	0.258***	0.259***	0.335***	0.331***	0.271***	0.265***	0.270***
	[0.044]	[0.043]	[0.050]	[0.050]	[0.045]	[0.040]	[0.051]	[0.049]	[0.051]
Observations	3,011	3,011	3,011	3,011	3,011	3,011	3,011	3,011	3,011
Adj. R-squared	0.608	0.606	0.647	0.646	0.596	0.597	0.647	0.646	0.65
Number of banks	448	448	448	448	448	448	448	448	448
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 12

Regulatory Fixed-Effects

This table reports estimates of the second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. The sample period is from 2001 to 2013. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	(1) ΔIPP	(2) ΔIPP	(3) ΔIPP
RegConnect x Δσv		1.063***	1.150***
		[0.298]	[0.289]
RegConnect		-0.447	-0.248
		[0.627]	[0.543]
RegbyFDIC x Δσv	-0.128	-0.062	
	[0.085]	[0.046]	
RegbyOCC x Δσv	-0.078	-0.003	
	[0.096]	[0.075]	
RegbyFDIC	0.09	0.086	
	[0.113]	[0.101]	
RegbyOCC	0.003	0.032	
	[0.128]	[0.119]	
FedDistrict 2 * Δσv			0.025
			[0.156]
FedDistrict 3 * Δσv			-0.259*
			[0.141]
FedDistrict 4 * Δσv			0.079
			[0.153]
FedDistrict 5 * Δσv			0
			[0.148]
FedDistrict 6 * Δσv			-0.198
			[0.145]
FedDistrict 7 * Δσv			0.157
			[0.169]
FedDistrict 8 * Δσv			-0.202
			[0.140]
FedDistrict 9 * Δσv			-0.19
			[0.138]
FedDistrict 10 * Δσv			-0.191
			[0.155]
FedDistrict 11 * Δσv			-0.206
			[0.148]
FedDistrict 12 * Δσv			0.065
			[0.147]
Δσv	0.396***	0.286***	0.242*
	[0.077]	[0.032]	[0.139]
Observations	3,011	3,011	3,011
Adj. R-squared	0.608	0.648	0.696
Number of banks	448	448	448
Bank Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Bank Controls	YES	YES	YES
Constant	YES	YES	YES

Table 13

Financial Crisis, Worst performing banks and Data Start Date

This table reports estimates of the second equation (Equation 6) of the Duan et al. (1992) framework using panel OLS regressions and examines the relationship between the sensitivity of changes in the deposit insurance premium to changes in portfolio risk. Refer to Appendix A for description of variables. Column 1 excludes years 2007 and 2008. Column 2 excludes the bottom 20% banks as ranked by ROA. Column 3 uses data from 2004 to 2013. Estimations of IPP and σv in Column 4 are calculated as in Duan (1994). The sample period is from 2001 to 2013 in Columns 1-3 and 2003 to 2008 in Column 4. Bank fixed-effects are used in all columns. Standard errors are clustered at the bank level and are reported in parenthesis. ***, ** and * indicate significance level at the 1, 5 and 10% respectively.

	Exclude 2007-2008 Crisis Years	Exclude Bottom 20% ROA	Sample Period 2004-2013	Duan (1994) Max. Likelihood estimations of IPP & σv
	(1)	(2)	(3)	(4)
	ΔIPP	ΔIPP	ΔIPP	ΔIPP
RegConnect x Δσv	1.085***	1.462***	1.137***	0.015**
	[0.373]	[0.532]	[0.331]	[0.006]
RegConnect	-0.184	-0.688	-0.972	-0.465
	[0.715]	[0.573]	[0.723]	[0.955]
Δσv	0.276***	0.203**	0.278***	0.0004
	[0.050]	[0.103]	[0.047]	[0.001]
Tier1 Capital	-2.096	-2.604	-5.188**	-10.772***
	[2.684]	[1.653]	[2.078]	[3.953]
Bad Loans	11.294***	3.348	9.707***	-3.169
	[3.397]	[2.576]	[2.458]	[2.298]
Lag Enforcement Actions	0.079	0.021	0.219***	-0.118*
	[0.058]	[0.034]	[0.071]	[0.061]
ROA	-9.062	-11.066	-6.022	-0.367
	[5.887]	[7.009]	[4.476]	[2.118]
Total Deposits	-0.357	-0.650*	0.753	-0.092
	[0.515]	[0.352]	[0.490]	[0.615]
Total Assets	0.671***	0.592***	0.958***	-0.618
	[0.254]	[0.225]	[0.284]	[0.603]
Charter Value	-0.063	-0.082	-0.329***	-0.109
	[0.058]	[0.052]	[0.079]	[0.093]
Asset Growth	0.240*	-0.004	0.083	-0.478*
	[0.139]	[0.107]	[0.090]	[0.265]
Total Loans	0.36	0.313	0.741**	1.007
	[0.330]	[0.284]	[0.335]	[0.814]
Market Risk	0.01	-0.089	-0.029	0.308
	[0.193]	[0.128]	[0.222]	[0.360]
Board Size	0.018	0.001	0.009	-0.01
	[0.011]	[0.010]	[0.011]	[0.016]
Board Independence	-0.273	-0.159	-0.407	-0.551
	[0.323]	[0.208]	[0.337]	[0.624]
CEO Tenure	0.006	0.001	0.005	-0.001
	[0.005]	[0.002]	[0.006]	[0.007]
Duality	0.124	0.075	0.142	0.157
	[0.076]	[0.059]	[0.087]	[0.133]
Constant	-4.568**	-3.304**	-6.601***	5.481
	[1.833]	[1.555]	[2.071]	[4.215]
Observations	2,423	2,408	2,718	299
Adj. R-squared	0.681	0.684	0.675	0.27
Number of banks	445	423	441	74
Bank Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES

Appendix A

Variable Definitions and Sources

Variable	Definitions	Source(s)
Financial variables		
σv%	The volatility of asset returns (annualized) in % as described in Appendix B	CRSP, FR Y9-C
IPP%	The fair value of the deposit insurance premium in % as described in Appendix B	CRSP, FR Y9-C
B	Book value of total liabilities	FR Y9-C
V	Market value of total assets	CRSP, FR Y9-C
σE	The volatility of monthly equity returns (annualized)	CRSP
E	The number of shares outstanding times the share price on the last day of the trading year	CRSP, FR Y9-C
Lev (B/V%)	Book value of liabilities / Market value of assets in %	FR Y9-C
Tier1 Capital	Tier 1 Capital / Total Assets	FR Y9-C
Bad Loans	Sum of loans past due 90 days or more and nonaccrual loans / Total Assets	FR Y9-C
ROA	Return on Assets defined as the Income before extraordinary items / Total Assets	FR Y9-C
Total Deposits	Total Deposits / Total Assets	FR Y9-C
Total Assets	Natural logarithm of the book value of total assets	FR Y9-C
Charter Value	Market value equity at year end / Book value of equity at year end	CRSP, FR Y9-C
Asset Growth	Change in total assets from previous year	FR Y9-C
Total Loans	Total Loans / Total Assets	FR Y9-C
Top5%Asset, Top10%Asset, Top20%Asset	A dummy variable that = 1 if the bank is placed in the top 5,10 or 20% of the book value of assets at 2007 and 0 if otherwise	FR Y9-C
Sub Debt	The book value of subordinated debt divided by the sum of subordinated debt and Tier1 Capital	FR Y9-C
Cash	Cash / Total Assets	FR Y9-C
Buy-Hold Annual Rets	Summation of [1+Log Monthly Buy-hold Returns for	CRSP

	the 12 months of the year] -1	
Noninterest Income	Noninterest Income / (Interest income + Noninterest Income)	FR Y9-C
Market Risk	(Short term interest earning assets - short term interest earning liabilities) / Total Assets	FR Y9-C
<u>Payout & TARP variables</u>		
Total Net Payout	(Common dividends + Net Repo) / Book value of equity	FR Y9-C
Div	Common dividends / Book value of equity	FR Y9-C
Net Repo	(Treasury stock purchase – Treasury stock sales) / Book value of equity	FR Y9-C
Pr(Total Net Payout ↑) & (Net Payout ↑)	A dummy variable that = 1 if the change in Net Payout from the previous year is positive and 0 if otherwise	FR Y9-C
Pr(TARP↑)	A dummy variable that = 1 if the bank receives funds from the Capital Purchase Program under Troubled Asset Relief Programe (TARP)	ProPublica
TARP%	The nominal amount of TARP funds received scaled by total assets	ProPublica
<u>Board variables</u>		
Board Size	Total number of board members	BoardEx
Board Independence	Total number of directors that are classified as independent / Board Size	BoardEx
CEO Tenure	Number of years the CEO has been on the board of directors	BoardEx
Duality	A dummy variable that = 1 if the CEO is also the Chairman and 0 if otherwise	BoardEx
<u>Bank structure variables</u>		
RegbyFDIC	A dummy variable that = 1 if the main bank subsidiary under the BHC is regulated by the FDIC and 0 if otherwise	Commercial Bank Call Report
RegbyOCC	A dummy variable that = 1 if the main bank subsidiary under the BHC is regulated by the OCC and 0 if otherwise	Commercial Bank Call Report
Enforcement Actions	Total number of enforcement actions issued by the Fed, FDIC, OCC and State regulators to a BHC or it's subsidiaries	Regulatory websites
BHCAge	Age (in years) of the BHC	FR Y9-C
<u>Connection variables</u>		
RegConnect	Total number of directors that have current or former experience in the Fed, FDIC, OCC, OTS, SEC, and	BoardEx, regulatory body websites and

	State regulators divided by board size	annual reports, Linkedin, news articles
RegConnnectPublicService	The total number of board members that have current or former experience in public service capacities at the Fed, FDIC, OCC, OTS, SEC or State regulators divided by board size. We define a position as public service if the regulatory position is held by directors who are employed by a bank and typically consists of advisory councils as well as federal reserve board of director positions.	BoardEx, regulatory body websites and annual reports, Linkedin, news articles
RegConnectRevolving	The total number of board members have held employment at any of the above defined regulatory bodies divided by board size	BoardEx, regulatory body websites and annual reports, Linkedin, news articles
RegConnectFed	The total number of board members in both public service and employment capacities at the Fed divided by board size	BoardEx, regulatory body websites and annual reports, Linkedin, news articles
RegConnectTenure	The total number of years that all connected directors of the bank board (defined in RegConnect) spent in the regulatory agencies	BoardEx, regulatory body websites and annual reports, Linkedin, news articles
Lobby Dummy	A dummy variable that = 1 if the bank lobbies	Center for Responsive Politics
Lobby%	Log (1+Total nominal amount spent on lobbying by a bank)	Center for Responsive Politics
PolConnect	Total number of directors that hold current or former positions in the US Congress , the US Department of the Treasury, the White House, are Deputy Secretary/Secretary of US Departments, are US State Lieutenant Governors/Governors or US City Mayors divided by board size	BoardEx, congress.gov and various news articles
TopPolitician	Total number of directors that have been Congressman (US Senators and US House Representatives), Deputy Secretary/Secretary of US Departments, US State Lieutenant Governors/Governors or US City Mayors divided by board size	BoardEx, congress.gov and various news articles
<u>State variables</u>		
State Corruption Score	Normalised score from a survey of State House reporters in 2003 on the level of corruption in their respective states	Boylan and Long (2003)
State Integrity Index	State level index in 2008 created by the Better Government Association which aggregates measure of freedom of information laws, whistle-blower protection laws, campaign finance laws, open meeting laws and conflict of interest laws	Better Government Association
FedDistrict 1 to 12	The Federal Reserve district that the BHCs are geographically located in.	FR Y9-C

Appendix B

Estimation of σ_V, V and IPP

We follow Ronn and Verma (1986), Duan, Moreau and Sealey (1992) and Bushman and Williams (2012) in estimating the 2 unobservables σ_V and V required as inputs to compute the insurance premium (IPP). We obtain values for both σ_V (volatility of asset returns) and V (market value of assets) by through solving an iterative process of 2 non-linear equations based on the Black-Scholes-Merton option pricing model.

The first equation (A1) models the market value of a bank's equity as a call option on the unobservable market value of a bank's total assets:

$$E = VN(X) - pBN(X - \sigma_V \sqrt{T}) \qquad \text{(A1)}$$

$$\text{where } X = (\ln(V / pB) + \sigma^2_V T/2) / (\sigma_V \sqrt{T}) \qquad \text{(A2)}$$

E is the market value of equity. *N*() is the cumulative density of a standard normal variable. *p* is a regulatory forbearance parameter introduced by Ronn and Verma, (1986) that accounts for regulatory delays in exercising the option due to dissolution costs. It is set to 0.97 following previous research (Ronn and Verma, 1986; Hovakimian, Kane and Laeven, 2003; Bushman and Williams, 2012) which allows the asset value of a bank to deteriorate to 97% of debt before the option is exercised. B is the book value of liabilities. T is the time to maturity of the option and is set to 1 on the assumption that the next audit occurs in 1 year where the option is re-priced following changes in the financial parameters.

From Ito's lemma:

$$\sigma_E = (VN(X)\sigma_V) / (E) \qquad \text{(B)}$$

where σ_E is the standard deviation of the returns of equity volatility. Equation (B) is the instantaneous standard deviation of the return on E and is the optimal hedge equation that relates the volatility of bank equity returns to bank asset returns. A Newton search algorithm then obtains annual estimates of σ_V and V by simultaneously solving equations (A1) and (B) in an iterative process.

After obtaining estimates of σ_V and V, we are then able to compute the fair value of the deposit insurance put option (IPP) derived by Merton (1977).

$$IPP = N(y + \sigma_V \sqrt{T}) - (1- \delta)^n (V/B) N(y) \quad (C1)$$

$$\text{where } y = ((\ln(B/V(1- \delta)^n) - (\sigma^2_V T/2)) / (\sigma_V \sqrt{T}) \quad (C2)$$

δ is the dividend per dollar of market value of assets. n is the number of times per period the dividend is paid per annum. Dividends are included in IPP valuation equation since the writer of the put option, the FDIC, is not dividend protected.

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