

# The Effect of Industrial Sector Transparency on Bank Risk-taking and Banking System Fragility

Sudarshan Jayaraman  
Olin Business School  
Washington University in St. Louis  
[jayaraman@wustl.edu](mailto:jayaraman@wustl.edu)

S.P. Kothari  
Massachusetts Institute of Technology  
[kothari@mit.edu](mailto:kothari@mit.edu)

January 2013

## Abstract

We show real effects in the banking sector that emanate from transparency in the industrial sector. Transparent financial reporting by industrial firms facilitates access to arm's-length financing from capital markets and diminishes these firms' reliance on banks. Banks, as a result, face increased competition in their product markets and seek to offset their lost rents by – (i) taking on more risk, (ii) reducing their cost structures and (iii) increasing the intensity of intermediation. The net effect of these activities is to lower the likelihood of a banking crisis in countries with greater borrower transparency. Additional tests suggest that risk-taking is channeled more through non-lending than lending activities, pointing to the beneficial role of diversification in reducing bank fragility. Tests using the mandatory adoption of International Financial Reporting Standards (IFRS) as a shock to borrower transparency indicate that endogeneity is unlikely to be driving our findings. A difference-in-differences design shows that risk-taking, cost efficiency and bank intermediation in banks of IFRS adopting countries are more salient than those in non-adopting countries. Overall, we provide novel evidence that transparency of the industrial sector strengthens the banking sector.

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We appreciate helpful comments from Ashiq Ali, Anne Beatty, Andy Bernard, Bill Cready, Mark DeFond, Ken French, Andy Leone, DJ Nanda, Suresh Radhakrishnan, Shivaram Rajgopal, Bob Resuttek, Sugata Roychowdhury, Cathy Schrand, K.R. Subramanyam, Xiaoli Tian, Regina Wittenberg-Moerman (Dopuch conference discussant) and workshop participants at Dartmouth (Tuck), Nick Dopuch 2012 Accounting Conference, Ohio State, University of Miami, USC and UT Dallas.

*“Fundamental economic forces have improved the availability of information in securities markets, making it easier and less costly for business firms to finance their activities by issuing securities rather than going to banks...fundamental forces not limited to the United States have caused a decline in the profitability of traditional banking throughout the world and have created an incentive for banks to expand into new activities and take additional risks”*

Franklin R. Edwards and Frederic S. Mishkin,  
FRB New York, Economic Policy Review, 1995

## **1. Introduction**

A growing literature finds that corporate transparency enables arm’s-length investors to evaluate and monitor the performance of firms (e.g., Ball, Kothari, and Robin, 2000, and Leuz, Lins and Warnock, 2009). This, in turn, enables firms to access financial markets to meet their borrowing needs instead of relying exclusively on local banks. The benefits of improved capital market access to borrowing firms have been well-documented (e.g., Bushman et al., 2011; DeFond et al., 2011; and Francis et al., 2009).

The expanded access to capital, while beneficial to industrial firms, is a competitive disadvantage to incumbent banks. By expanding industrial firms’ access to capital markets, borrower transparency forces domestic banks to compete with these alternate suppliers of financing. However, little is known about the effects of this borrower transparency on bank product-market competition and on banks’ response to the increased competition. We provide evidence that speaks to these issues.

Two sets of theories – the first from the banking literature and the second from the industrial organization literature – inform us about banks’ expected reaction to borrower transparency. Banks are expected to take on more risk when competition intensifies in their product markets (as the opening quote indicates; see also Keeley, 1990; Besanko and Thakor, 1993; Boot and Greenbaum, 1993; Hellman, Murdock and Stiglitz, 2000). The rationale is that, as competition shrinks the discounted stream of future profits (known as the “charter value”),

banks attempt to compensate for the reduction through greater risk-taking. Thus, we predict that corporate transparency would engender greater bank risk-taking.

A well-established prediction from the industrial organization literature is that competition forces firms to operate more efficiently, i.e., reduce costs (e.g., Schmidt, 1994; Nickell, 1996). With respect to banks, Jayaratne and Strahan (1998) show that bank operating costs fall after the relaxation of barriers inhibiting bank competition. Our second prediction is that transparency would spur bank efficiency, defined as the proportion of costs to revenues.

Before we present our results, it is pertinent to ask whether econometric hurdles as well as confounding events hurt our ability to provide conclusive evidence of a link from industrial sector transparency to banking sector outcomes. For example, it is possible (and quite likely) that borrower transparency is not exogenously imposed on firms, but rather endogenously determined based on a cost-benefit tradeoff that entails variables that we might omit from our empirical specifications. Or, there might be reverse causality concerns wherein the structure of the banking industry influences transparency in the industrial sector. Alternatively, our outcome variables could in fact be driven by differences in bank transparency, rather than borrower transparency. In what follows, we first present our primary results and then proceed to systematically address each of the above concerns. Fortunately, our inferences survive a battery of tests and in particular research designs that use a shock to borrower transparency. These additional tests strengthen the conclusion of a causal effect running from corporate transparency in the industrial sector to economic outcomes in the banking sector.

Evidence from a large panel of banks from 37 countries supports our two main predictions about risk taking and cost efficiency.<sup>1</sup> In particular, corporate transparency (defined

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<sup>1</sup> The cross-country design is ideally suited to our setting for three reasons. First, it offers richer variation in corporate transparency relative to a single-country design. Second, it allows a time-series analysis that

as the availability of firm-specific information to external market participants and measured at the country-level, see Bushman et al., 2004) is associated with bank risk-taking as well as cost efficiency. The findings are robust to a host of bank- and country-level factors, and are also economically significant. Moving from the median level of transparency (which corresponds to Japan) to the upper quartile (Norway) increases bank risk-taking by 13% and cost efficiency by 5%. These results indicate that borrower transparency plays an important role in promoting efficiency in the banking sector, but that it might come at the expense of elevated risk taking.

The impact of bank risk-taking on the stability of the banking system is a subject of ongoing research in the literature without a consensus. For example, Hellman et al. (2000) argue that competition induces excessive bank risk-taking, which in turn increases the likelihood of a financial crisis.<sup>2</sup> Similarly, Keeley (1990) asserts that increased competition caused the higher occurrence of U.S. bank failures since the early 1980s. This line of reasoning suggests that banks in countries with higher borrower transparency would be more likely to encounter a banking crisis. In contrast, Edwards and Mishkin (1995, pg. 27) reason that “declining profitability could tip the incentives of bank managers toward assuming greater risk in an effort to maintain former profit levels”, which suggests greater bank stability.

Using data on prior banking crises from Barth, Caprio and Levine (2004, 2008), we examine how corporate transparency affects the likelihood of countries experiencing a banking crisis. In addition to bank fragility, we also examine how transparency influences bank development (a measure of the intensity of bank intermediation), which Levine et al. (2000)

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uses shocks to corporate transparency to examine *changes* in the outcomes. Third, as the response to the shock is likely to be heterogeneous, cross-country diversity in institutional features enables us to rule out several alternate interpretations by performing cross-sectional variation or comparative static tests (see Angrist and Krueger, 2001).

<sup>2</sup> The effect of bank competition in Hellman et al. emanates from higher deposit rates (the liability side of the balance sheet). Corporate transparency, on the other hand, induces greater competition on the asset side. In either case, competition reduces banks’ charter values, thus inducing risk-taking.

define as the extent to which the banking sector “researches and identifies profitable ventures, monitors and controls managers, eases risk management and facilitates resource mobilization.”<sup>3</sup>

We find that corporate transparency diminishes the likelihood of a banking crisis and stimulates bank development. In terms of economic significance, moving from the lower quartile of transparency (Israel) to the upper quartile (Norway) reduces the likelihood of a banking crisis from 55% to 40%; and increases bank development by around 9%. These results suggest that industrial sector transparency fosters a stable and vibrant banking sector and echo Carletti and Hartmann (2003) who opine that “...the idea that competition is something dangerous in the banking sector, since it generally causes instability can be dismissed”.

To further understand the influence of transparency on bank risk-taking and banking system stability, we study the underlying mechanisms driving these relations. Edwards and Mishkin (1995) note that the increase in risk-taking can come in one of two ways “...banks might make loans to less creditworthy borrowers or engage in nontraditional financial activities that promise higher returns but carry greater risk”. They surmise that venturing into non-lending activities can make banks more diversified and hence less susceptible to failure.

We examine the extent to which the influence of borrower transparency on bank risk-taking is channeled through non-lending activities.<sup>4</sup> We find that moving from the median level of transparency to the upper-quartile increases risk-taking by 11% in a bank focused exclusively on lending activities, compared to 18% in one with an equal emphasis on lending and non-lending activities. These results suggest that banks respond to borrower transparency by taking on lending as well as non-lending risk (consistent with Boot and Thakor, 2000), but the

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<sup>3</sup> Bank development is defined as the ratio of bank credit to the private sector as a share of GDP.

<sup>4</sup> We use the proportion of non-interest revenue to total revenues to capture the extent of non-lending activities undertaken by the bank (see Demircuc-Kunt and Huizinga, 2010).

influence of the latter dominates.<sup>5</sup> The results also shed light on the role of bank diversification in enhancing bank stability – an area of ongoing interest and debate in the banking literature (See Barth et al., 2004 and references therein).

By way of limitations of our cross-sectional design, it is possible that industrial firms endogenously choose the optimal level of transparency based on factors that we omit from our regressions. Or perhaps, the results are driven by reverse causality, where industrial firms in a country choose higher transparency when they borrow from riskier banks. Or yet still, omitted country-level factors correlated with borrower transparency (e.g., investor protection) are also correlated with bank risk-taking, thereby making inferences of causality problematic.

There are two potential approaches to addressing the endogeneity of industrial sector transparency. The first is to build a full-fledged structural model that explicitly incorporates all the costs and benefits of greater transparency. The second approach is to use a shock to transparency and estimate a reduced-form model of the endogenous variable. Given the conceptual and methodological challenges in developing a structural model, we use the latter approach. A distinct advantage of this approach is that we can document *within-country* variation by including country fixed-effects that control for *all* time-invariant differences across countries (e.g., investor protection, rule of law, corruption etc.).

We use the mandatory adoption of International Financial Reporting Standards (IFRS) by several countries in 2005 as such a shock to transparency. Prior evidence indicates that IFRS adoption increases borrower transparency and also firms' access to arm's-length financing. For example, Daske et al. (2008) show that IFRS adoption results in higher transparency in industrial firms, while DeFond et al. (2011) find that the adoption of IFRS increases foreign

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<sup>5</sup> It could be that banks that engage in both lending and non-lending activities take on more lending risk. We provide further evidence on this issue in subsequent tests around our IFRS shock.

mutual fund ownership (a form of arm's-length financing). Thus, based on our hypotheses, we expect IFRS adoption to result in greater bank risk-taking, higher cost efficiency and more bank development in banks of IFRS adopters compared to those of non-adopters.<sup>6</sup>

Using a difference-in-differences design (augmented with country fixed effects), we find that IFRS adoption does indeed result in a strong increase in risk-taking to the tune of 15% and a 4% increase in the cost efficiency of banks from adopting countries relative to non-adopting countries. To examine the role of lending vs. non-lending activities, we split the sample based on whether banks increase their reliance on non-lending activities between the pre and post periods. We find that bank risk-taking increases by 34% (18%) in the sub-sample of banks that increase (do not increase) their reliance on non-lending activities between the pre and post periods.<sup>7</sup> These results suggest that banks respond to enhanced borrower transparency by taking on both lending and non-lending risk and that the influence of the latter dominates. Further, IFRS adoption also improves bank development by around 8%.<sup>8</sup> Overall, the time-series tests complement the cross-sectional results and document the causal role of industrial sector transparency in influencing the functioning of the banking sector.

The next challenge is to rule out the possibility that omitted factors in banks' reporting environment are driving our results. In particular, it could be that our results are driven by variation in bank transparency rather than borrower transparency, which if true, would undermine the inter-connectedness between the industrial and banking sectors. We do not find this alternative explanation compelling because bank transparency tends to *dissuade* rather than

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<sup>6</sup> One could argue that IFRS adoption results in greater comparability rather than transparency. However, these constructs are related, as contemporaneous increases in transparency amongst firms within a country would result in greater comparability between them.

<sup>7</sup> These tests require a constant sample of banks that exist in both the pre and post periods and are thus not comparable to the overall results. The overall increase in risk taking in this constant sample is 23%.

<sup>8</sup> We are unable to examine changes in bank fragility as these data do not vary over time for each country.

encourage bank risk-taking (e.g., Bushman and Williams, 2012; Nier and Baumann, 2006). We nevertheless control for differences in bank transparency in our empirical specifications. We follow Altamuro and Beatty (2010) and use two measures of bank transparency – loan loss timeliness and bank income smoothing. We find that our results are robust to controlling for differences in bank transparency.

A related concern could be that since banks also adopted IFRS at the same time as industrial firms, our IFRS results might be due to the direct effects of IFRS adoption by banks (which would violate the exclusion criterion for our instrument). To rule this possibility out, we provide cross-sectional variation in the effect of IFRS adoption on bank risk-taking. If the higher risk-taking we observe is driven by banks adopting IFRS, then it should be observed in all adopting countries. On the other hand, if the results stem from increases in borrower transparency as we argue, then they should be stronger in countries where IFRS adoption has been shown to increase borrower transparency. In particular, Daske et al. (2008) find that IFRS adoption increases transparency of industrial firms only in countries that have strong legal enforcement and where firms have incentives to be transparent.

We follow this line of reasoning and split our sample based on countries' strength of legal enforcement and incentives to be transparent.<sup>9</sup> We find that post-IFRS adoption increases in bank risk-taking are concentrated in countries where industrial firms experience increases in transparency (i.e., countries with strong enforcement and with incentives to be transparent). While one could argue that these are the same environments where even banks experience increases in transparency, this effect should work in the opposite direction (as noted above).

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<sup>9</sup> We measure legal enforcement using the three variables used by LaPorta et al. (1998) – efficiency of the judicial system, rule of law and the corruption index. We capture incentives to be transparent using the anti-self-dealing index of Djankov et al. (2008).



As an additional cross-sectional test, we restrict our sample to private banks. Since IFRS was mandatorily adopted by all public firms (and banks), any increases in bank risk-taking that we observe for private banks is unlikely to be driven by banks adopting IFRS. Another advantage here is that our sample allows us to control for whether the private banks voluntarily adopted IFRS. We find that private banks also experience significant increases in risk taking around IFRS adoption (even after controlling for possible voluntary IFRS adoptions). These results further weaken the argument that our results are driven by banks adopting IFRS.

The final concern we examine is that increases in borrower transparency around IFRS adoption are due to contemporaneous changes in enforcement rather than the accounting regime, as posited by Christensen et al. (2012). While this debate has not yet been settled, we provide some preliminary investigation into whether our results are due *exclusively* to enforcement. Following Christensen et al. who find that the effect of IFRS adoption on firm transparency is concentrated in the European Union (EU), we split our treatment banks into two categories – those within the EU and those outside. Consistent with their findings, we find that the effect of IFRS adoption on bank risk-taking is concentrated in the EU. This suggests that IFRS adoption by itself is insufficient to generate the economic effects that we document.

We go one step further and examine whether enforcement changes alone are sufficient to explain our findings. To do so, we restrict our control group to Japan, as Christensen et al. find that Japan (a non-adopter) also initiated enforcement changes during this period. We find that EU banks continue to experience increases in risk-taking when benchmarked against Japanese banks.<sup>10</sup> These results indicate that while IFRS adoption alone is insufficient, so is a mere change in enforcement. Overall, we summarize these results as indicating that IFRS

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<sup>10</sup> This is not inconsistent with Christensen et al. as we document *incremental*, not absolute effects.

adoption and changes in enforcement act as complements in generating the economic effects that we observe in the banking sector around IFRS adoption.

Our results are robust to a host of additional sensitivity tests. First, our inferences are unaltered when we use alternate measures of bank risk-taking. In particular, we use the ratio of non-performing loans to total loans as a measure of loan portfolio risk and find consistent results. Second, we verify that our results are robust to defining corporate transparency in alternative ways. In particular, we use (i) the Leuz et al. (2003) aggregate earnings management score as an output-based measure of transparency, (ii) the CIFAR index (without its components) and (iii) an expanded measure that incorporates other facets of countries' information environment. We find consistent results in all three cases. Third, our results are robust to several falsification tests. In particular, a randomly assigned transparency score (and iterated 1,000 times) does not depict any association with bank risk-taking or cost efficiency. Similarly, the IFRS results do not go through when we use a pseudo shock by back-dating the actual adoption date. This indicates that our IFRS results are not due to ongoing time trends in bank risk-taking. Fourth, controlling for the effect of competition on the liability side of bank balance sheets does not alter our inferences. Fifth, our results are robust to using alternate empirical specifications and also to filters that ensure comparability across the sample countries. In particular, we re-run our results using one observation per bank (9,038 observations) as well as one observation per country (37 observations) and find consistent results in both cases. Finally, our inferences remain unchanged when we include U.S. banks.

Our study, which seeks to document how industrial sector transparency affects economic outcomes in the banking sector, is important and novel for two reasons. First, the recent financial crisis and the ensuing economic slowdown have heightened the importance of better understanding the inter-connectedness between the industrial and banking sectors. While

several recent studies undertake this endeavor, the transmission mechanism in these studies is almost always from the banking sector to the industrial sector. Our study, in contrast, provides evidence of the chain of causality working in the reverse direction, i.e., from the industrial sector to the banking sector. Second, ours is the first study to document the important role that industrial sector transparency plays in the efficient functioning of the banking sector. While a long stream of research in accounting documents the role of firm transparency on firm outcomes and similarly of bank transparency on banking outcomes, ours is the first study to document the inter-connectedness between transparency in the industrial sector and economic outcomes in the banking sector. An important implication of our study is that one of the ways in which the banking sector can be made more efficient and stable is by improving transparency in the industrial sector – a channel that has not been recognized as yet.

Two additional contributions are worth noting. Our study broadens the economic consequences of IFRS adoption beyond financing benefits to industrial firms. We show that IFRS adoption promotes the development of the banking sector. This is important because bank development is a significant contributor of economic growth (Levine, 1997). Finally, our study contributes to the bank competition-risk-taking literature, an area where Carletti and Hartmann (2003) note “only few of the papers endogenise aspects of industrial organisation in their analysis...the majority of them just compares the equilibriums achievable in different market settings”. By documenting that shocks to borrower transparency lead to increases in bank risk-taking, cost efficiency and bank development, our study provides evidence of causality.

Section 2 presents the motivation followed by the hypotheses. Section 3 outlines the empirical design and Section 4 describes the results. Section 5 discusses the IFRS adoption tests followed by an examination of alternative interpretations in Section 6. Section 7 provides results of robustness tests and Section 8 concludes.

## 2. Motivation and Hypotheses Development

The importance of reliable financial reporting information in allowing lenders of capital to evaluate and periodically monitor borrowers' performance has been well documented. For example, Ball et al. (2000) show that higher quality (i.e., transparent) financial reporting allows firms to borrow from arm's-length capital markets rather than being confined to local sources of capital, e.g., from banks. A large literature built on this insight documents the benefits of financial reporting transparency to industrial firms, viz., alleviating financing constraints and enabling firms to avail of investment opportunities (e.g., Bushman et al., 2011; Francis et al., 2009; and Biddle et al., 2009).

The enhanced access to capital, while a benefit to borrowing firms, is a significant cost to banks. Before corporate transparency opened up these alternate financing venues for borrowing firms, banks had monopoly access to these firms' borrowing needs. Banks therefore potentially enjoyed rents in the lending market. By expanding borrowing firms' access to capital markets, borrower transparency forces banks to compete more fiercely with the additional purveyors of financing. In contrast to the large literature that documents the financing benefits of transparency to borrowing firms, banks' reaction to the increased competition following greater borrower transparency has been relatively unexplored. We develop hypotheses drawing from two (related) literatures – the banking literature on risk-taking and the industrial organization literature on cost efficiency.

### 2.1. *Corporate transparency and bank risk-taking*

Banking theories predict that banks take on more risk when operating in a competitive product market. Theories linking bank competition to risk-taking allude to the “franchise value” or “charter value” of banks, which Hellman, Murdock and Stiglitz (2000, p. 149) define

as “the discounted stream of future profits for the bank, a value that can only be captured if the bank stays in operation”. By reducing banks’ charter values (i.e., future profitability), greater competition lowers banks’ incentives to make safe bets and thus fosters greater risk-taking in the hope of enhancing profitability. In their review paper, Carletti and Hartmann (2003) state that “theories based on the idea of ‘charter value’ argue that market power mitigates bank risk taking, since high margins act as a buffer against portfolio risk and increase the cost of bankruptcy”. Similarly, Besanko and Thakor (1993) and Boot and Greenbaum (1993) show analytically that increased bank competition induces banks to choose riskier portfolio strategies. The idea is that banks, in the course of relationship-based lending, acquire private information that generates informational rents. As long as banks can appropriate some portion of these rents, they have an incentive to limit their risk exposure so as to preserve the value of the relationship. However, once the industry becomes more competitive, the value of relationship banking decreases and banks respond by taking on more risk (see also Boot and Thakor, 2000).

Keeley (1990) offers evidence consistent with the charter-value hypothesis. He examines whether increased competition in the banking industry brought about by the easing of banking restrictions influences bank risk-taking. He finds that an increase in bank competition reduces banks’ franchise values and that banks respond by taking on more risk. Based on the above studies, we expect corporate transparency to be associated with more bank risk-taking.<sup>11</sup> Thus, our first hypothesis under the premise that borrower transparency intensifies bank competition is stated in the alternative as follows:

*H1: Corporate transparency is positively associated with bank risk-taking.*

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<sup>11</sup> While stated as a directional prediction, we acknowledge that an alternate stream of research argues that lower competition can also result in higher bank-risk. For example, Boyd and De Nicolo (2005) argue that greater concentration in the lending market allows banks to charge higher interest rates. As these rates make repayment more difficult, they exacerbate borrowers’ moral hazard incentives to shift into riskier projects, thus leaving the bank with a riskier set of borrowers (see also Berger et al., 2008).

## 2.2. *Corporate transparency and cost efficiency*

Industrial organization theories predict that firms face pressures to reduce costs and maximize efficiency when operating in a competitive product market. For example, Schmidt (1994) argues that competition raises the probability of bankruptcy and thereby generates strong incentives for managers to avoid this fate by improving efficiency. Similarly, Nickell (1996) argues that competition exerts a downward pressure on costs, reduces slack, and provides incentives for the efficient organization of production. In the banking context, Jayaratne and Strahan (1998) find that the relaxation of barriers impeding bank competition is followed by a sharp increase in bank efficiency (i.e., decreases in banks' operating costs). Based on these studies, we expect corporate transparency to be associated with greater cost efficiency (i.e., a lower proportion of costs to revenues). Thus, our second hypothesis is as follows:

*H2: Corporate transparency is positively associated with cost efficiency.*

## 2.3. *Mechanisms underlying risk-taking*

Our next hypothesis examines the underlying mechanisms that drive the relation between borrower transparency and bank risk-taking. Changes in risk-taking can emanate from the lending channel or non-lending activities (or both). Edwards and Mishkin (1995) argue that banks "can attempt to maintain their traditional lending activity by expanding into new, riskier areas of lending". They point to real-estate loans as one such avenue. Citing the example of U.S. banks in the 1990s, they point out that these banks appear to have maintained their profitability and in particular, their net-interest-margin by taking on greater risk.

The second way that banks can preserve their profit levels is to pursue several fee-based non-lending activities such as derivatives trading and other off-balance-sheet activities. As theoretical studies do not provide insights into the circumstances under which one channel is

expected to dominate the other, we present the influence of these two mechanisms as a non-directional hypothesis. Our third hypothesis (stated in the null) is as follows:

*H3: Risk-taking as a result of corporate transparency is unrelated to the mix between banks' lending and non-lending activities.*

#### *2.4. Is the greater bank risk-taking excessive?*

We examine whether the effect of competition on bank risk-taking goes too far. Excessive risk-taking can have adverse effects such as bank runs and substantial costs to taxpayers of bailing out failed banks. Therefore, bank regulators and taxpayers are interested in understanding the circumstances that contribute to excessive bank risk-taking that causes instability in the banking system. The effect of corporate transparency on bank fragility can go either way. For example, Hellman et al. (2000) argue that greater bank competition increases the probability of a banking crisis. In their model, the payoff of the risky asset in the bad state is insufficient to pay off bank depositors, thereby resulting in a bank failure. Similarly, Keeley (1990) states that increased competition is the cause for the higher occurrence of bank failures in the U.S. since the early 1980s.

While risk-taking can increase bank failures, so can bank inaction in a competitive market. For example, Edwards and Mishkin (1995, pg. 27) state that “declining profitability could tip the incentives of bank managers toward assuming greater risk in an effort to maintain former profit levels”. They also point out that the greater diversification benefits of venturing into non-lending activities will make banks less susceptible to failure. Thus, the theoretical link between borrower transparency and bank stability is ambiguous (see Carletti and Hartmann (2003) for a detailed discussion). We therefore present our fourth hypothesis as non-directional:

*H4: Corporate transparency is unrelated to the stability of the banking system.*

### 3. Research design and data

In this section, we describe the empirical proxies, motivate our control variables, present our regression specifications, and follow that with a description of our sample.

#### 3.1 Primary variables

##### 3.1.1. Bank risk (*ZSCORE*)

We follow prior studies such as Laeven and Levine (2009) and measure bank risk using the z-score (*ZSCORE*), which is the inverse measure of the likelihood of insolvency. Thus, lower values of *ZSCORE* indicate greater bank risk. *ZSCORE* is defined as return on assets plus the capital asset ratio divided by the standard deviation of asset returns. This measure captures the distance from insolvency (Roy, 1952), where insolvency is said to occur when losses exceed bank equity (i.e.,  $E < -\pi$ ; where  $E$  represents equity and  $\pi$  denotes profits). This condition can be restated as  $\text{Prob}(-ROA < CAR)$ , where  $ROA$  ( $\pi/A$ ) is the return on assets and  $CAR$  ( $E/A$ ) is the capital asset ratio (see Laeven and Levine, 2009 for details).<sup>12</sup> Thus, under normally distributed profits, the inverse of the likelihood of insolvency (*ZSCORE*) is expressed as follows:

$$ZSCORE = \frac{ROA + CAR}{\sigma(ROA)} \quad (1)$$

##### 3.1.2. Cost efficiency (*EFFIC*)

We measure cost efficiency (*EFFIC*) as the proportion of overhead costs to total revenues (i.e., interest revenues plus non-interest revenues).

##### 3.1.3. Corporate transparency (*CORPTRAN*)

We follow Bushman et al. (2004, pg. 207) and define corporate transparency as the availability of firm-specific information to external market participants. We measure corporate

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<sup>12</sup> Our results are robust to using return on equity instead of return on assets.



transparency based on a comprehensive set of country-level measures that encapsulate the financial reporting environment of the country (see Bushman et al. and Francis et al., 2009).<sup>13</sup> The first is *CIFAR*, representing the average number of 90 accounting and non-accounting items disclosed by a sample of large companies in their annual reports created by the Center for International Financial Analysis and Research (CIFAR). These indices rate the annual reports of at least three firms in every country based on the inclusion or omission of 90 specific items.<sup>14</sup> These items are classified into seven categories – general information (8 items), income statement (11 items), balance sheet (14 items), funds flow statement (5 items), accounting policy disclosure (20 items), shareholders’ information (20 items), and other supplementary information (12 items). The disclosures are binary in nature (i.e., presence vs. absence) rather than qualitative. Countries are scored out of 90 points where higher numbers indicate greater financial disclosure intensity.

Our second measure is *GOVERN*, which captures the prevalence of specific governance related disclosures made by the firm. These disclosures relate to the identity of managers, of board members and their affiliations, remuneration of officers and directors, share ownership by directors and employees, identity of major shareholders, and the range of shareholdings. CIFAR ranks each country within the total sample of countries on the comprehensiveness of the disclosures for each category. *GOVERN* is the average percentile rank within the sample of countries across all categories.

The third measure, *PRINCIPLE*, captures country-level differences in accounting principles that are used. This measure captures the extent to which financial statements reflect subsidiaries on a consolidated basis and whether or not general reserves are used. As

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<sup>13</sup> These measures are obtained from Bushman et al. (2004).

<sup>14</sup> What makes CIFAR especially well-suited for our setting is that it is based on the financial reports of only industrial firms in the country and excludes the financial sector.

consolidated financial statements are generally considered more informative, while using general reserves contributes to opacity, *PRINCIPLE* takes higher values when financial statements are consolidated and when general reserves are not used. *PRINCIPLE* is the average percentile rank within the sample of countries across these two categories.

The fourth measure of corporate transparency is timeliness of financial reporting (*TIME*), which captures the frequency and comprehensiveness of interim reports. Higher values of *TIME* are interpreted as more timely financial reporting information. *TIME* is the average percentile rank within the sample of countries across the categories as indicated by CIFAR.

Our fifth measure, *AUDIT*, captures the credibility of financial reporting using CIFAR data on the share of Big 6 accounting firms of the total value audited in a country. It represents high quality auditing that increases the credibility of financial accounting disclosures. *AUDIT* takes the values of 1-4 depending on the percentage share of Big 6 auditors (i.e., 0-25%, 25-50%, 50-75% and 75-100%).

We combine *CIFAR*, *GOVERN*, *PRINCIPLE*, *TIME* and *AUDIT* to form an overall measure of corporate transparency (*CORPTRAN*) using principal component analysis.<sup>15</sup> We standardize the variables by setting all prior communality estimates to 1. The factor loadings on *CIFAR*, *GOVERN*, *PRINCIPLE*, *TIME* and *AUDIT* (based on the principal axis method) are 0.884, 0.744, 0.502, 0.651 and 0.842 respectively. We retain the first component which has an eigenvalue of 2.719 and explains around 54% of the total variation. While the second component's eigenvalue (1.022) is marginally above the conventional cutoff of 1, we exclude it based on the scree test (Cattell, 1966). This test, which isolates meaningful components from others based on breaks in the components' distribution, identifies only the first component as being important. We label this first principal component as *CORPTRAN*.

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<sup>15</sup> Our results are robust to alternate ways of measuring transparency and are discussed in Section 6.3.

#### 3.1.4. *Non-lending activities (NONINT)*

We measure the extent of non-lending activities within the bank using the proportion of non-interest revenues (*NONINT*). We follow Demirguc-Kunt and Huizinga (2010) and define *NONINT* as the proportion of non-interest revenues to total revenues (interest revenue plus non-interest revenue). Higher values of *NONINT* denote higher reliance on non-lending activities by the bank to generate revenues.

#### 3.1.5. *Banking system performance*

To test whether observed levels of bank risk-taking are excessive (hypothesis *H4*), we use data on bank fragility from Barth, Caprio and Levine (2001, 2004). The bank fragility measure is based on a crisis indicator (*BNKCRISIS*) which denotes whether a country suffered a major banking crisis during the late 1980s or 1990s as per the data in Caprio and Klingebiel (1999). In addition to the likelihood of a banking crisis, we also examine how corporate transparency correlates with bank development - a measure of the intensity of bank intermediation used by Barth et al. Levine et al. (2000) conceptualize bank development as a measure of the extent to which the banking sector searches and identifies profitable ventures, monitors and controls managers, eases risk management and facilitates resource mobilization. Following these studies, we define bank development (*BNKDEV*) as bank credit to the private sector scaled by GDP.

### 3.2 *Control variables*

We now discuss variables related to bank risk-taking and incorporate them in a multivariate regression to ascertain whether the explanatory power of *CORPTRAN* with respect to *ZSCORE* (and *EFFIC*) is incremental to that of these characteristics.

Following Laeven and Levine (2007, 2009), we include an array of bank-level and country-level variables as controls. The bank-level variables are bank growth (*GROWTH*), defined as the annual growth in revenues, total assets of the bank (*LNASSETS*) to control for bank size, liquidity (*LIQUID*), defined as the proportion of liquid assets to liquid liabilities, loan loss provisions (*LLP*) to control for differences in loan quality, whether the bank is public or private (*LISTED*)<sup>16</sup>, and market-share of total deposits that the bank holds (*MKTSHARE*).

The country-level variables we include are the strength of creditor rights (*CREDRIGHTS*) as defined by LaPorta et al. (1998), the level of GDP (*GDP*), annual growth in GDP (*GDPGROWTH*), and annual inflation (*INFL*). To ensure that corporate transparency is not merely capturing differences in financial market development, we include variables that capture the level of financial market development, viz., equity market cap of listed firms as a ratio of GDP (*MKTCAP*), turnover of listed firms scaled by GDP (*TURNOVER*), and the extent of international trade (*TRADE*), defined as the ratio of imports plus exports scaled by GDP. Finally, we follow Laeven and Levine and include year indicators and cluster our robust standard errors at the bank level.

### 3.3 Multivariate regressions

To test hypotheses *H1* and *H2*, we estimate the following multivariate regressions:

$$\begin{aligned}
ZSCORE_{i,t} = & \beta_0 + \beta_1 CORPTRAN_i + \beta_2 GROWTH_{i,t} + \beta_3 LNASSETS_{i,t} + \beta_4 LIQUID_{i,t} \\
& + \beta_5 LLP_{i,t} + \beta_6 LISTED_i + \beta_7 MKTSHARE_{i,t} + \beta_8 CREDRIGHTS_i + \beta_9 GDP_{i,t} \quad (2) \\
& + \beta_{10} GDPGROWTH_{i,t} + \beta_{11} INFL_{i,t} + \beta_{12} MKTCAP_{i,t} + \beta_{13} TURNOVER_{i,t} \\
& + \beta_{14} TRADE_{i,t} + \sum YEAR + \varepsilon_{i,t}
\end{aligned}$$

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<sup>16</sup> Following Laeven and Levine (2007), we use the “Listed” indicator to identify public vs. private banks.

$$\begin{aligned}
EFFIC_{i,t} = & \mu_0 + \mu_1 CORPTRAN_i + \mu_2 GROWTH_{i,t} + \mu_3 LNASSETS_{i,t} + \mu_4 LIQUID_{i,t} + \mu_5 LLP_{i,t} \\
& + \mu_6 LISTED_i + \mu_7 MKTSHARE_{i,t} + \mu_8 CREDRIGHTS_i + \mu_9 GDP_{i,t} \\
& + \mu_{10} GDPGROWTH_{i,t} + \mu_{11} INFL_{i,t} + \mu_{12} MKTCAP_{i,t} + \mu_{13} TURNOVER_{i,t} \\
& + \mu_{14} TRADE_{i,t} + \sum YEAR + \varepsilon_{i,t}
\end{aligned} \tag{3}$$

*H1* predicts that  $\beta_1 < 0$  in that transparency allows for increased bank risk-taking.

Similarly, *H2* predicts that  $\mu_1 < 0$ , as borrower transparency enhances cost efficiency.

To test hypothesis *H3*, we estimate the following regression:

$$\begin{aligned}
ZSCORE_{i,t} = & \delta_0 + \delta_1 CORPTRAN_i + \delta_2 CORPTRAN_i * NONINT_{i,t} + \delta_3 NONINT_{i,t} + \delta_4 GROWTH_{i,t} \\
& + \delta_5 LNASSETS_{i,t} + \delta_6 LIQUID_{i,t} + \delta_7 LLP_{i,t} + \delta_8 LISTED_i + \delta_9 MKTSHARE_{i,t} \\
& + \delta_{10} CREDRIGHTS_i + \delta_{11} GDP_{i,t} + \delta_{12} GDPGROWTH_{i,t} + \delta_{13} INFL_{i,t} \\
& + \delta_{14} MKTCAP_{i,t} + \delta_{15} TURNOVER_{i,t} + \delta_{16} TRADE_{i,t} + \sum YEAR + \varepsilon_{i,t}
\end{aligned} \tag{4}$$

$\delta_2$  captures the role of non-lending activities in the relation between corporate transparency and risk-taking; where a positive (negative) coefficient indicates that non-lending activities attenuate (magnify) the effect of corporate transparency on risk-taking.

Finally, the following two specifications test hypothesis *H4*:

$$\begin{aligned}
BNKDEV_{i,t} = & \gamma_0 + \gamma_1 CORPTRAN_i + \gamma_2 NONINT_{i,t} + \gamma_3 PVTMON_{i,t} + \gamma_4 OFFPOW_{i,t} \\
& + \gamma_5 CREDRIGHTS_i + \gamma_6 GDP_{i,t} + \gamma_7 GDPGROWTH_{i,t} + \gamma_8 INFL_{i,t} \\
& + \gamma_9 MKTCAP_{i,t} + \gamma_{10} TURNOVER_{i,t} + \gamma_{11} TRADE_{i,t} + \sum YEAR + \varepsilon_{i,t}
\end{aligned} \tag{5}$$

$$\begin{aligned}
\Pr(BNKCRISIS_i = 1) &= \pi_0 + \pi_1 CORPTRAN_i + \pi_2 NONINT_{i,t} + \pi_3 PVTMON_{i,t} + \pi_4 OFFPOW_{i,t} \\
&+ \pi_5 CREDRIGHTS_i + \pi_6 GDP_{i,t} + \pi_7 GDPGROWTH_{i,t} + \pi_8 INFL_{i,t} \\
&+ \pi_9 MKTCAP_{i,t} + \pi_{10} TURNOVER_{i,t} + \pi_{11} TRADE_{i,t} + \sum YEAR + \varepsilon_{i,t}
\end{aligned} \tag{6}$$

$\gamma_l > 0$  ( $\gamma_l < 0$ ) and  $\pi_l < 0$  ( $\pi_l > 0$ ) indicate that corporate transparency is associated with a more (less) vibrant and a more (less) stable banking sector.

### 3.4 Sample

Our data are from four different sources. Bank risk-taking and the other accounting data are from Bankscope, a Bureau van Dijk database on major international banks. The CIFAR measures of corporate transparency are from the sources in Bushman et al. (2004). *BNKDEV* and other macroeconomic variables such as *GDP*, *MKTCAP* etc. are from the World Development Indicators (WDI) database of the World Bank. Data on banking crises are from Barth et al. (2001). To ensure comparability across countries, we follow Laeven and Levine (2007) and delete banks with total assets of less than US\$ 100 million.<sup>17</sup> We also delete banks classified as “Islamic banks” as accounting information of these banks does not match the rest of the sample.

The Bankscope universe comprises of 186,839 bank-year observations, excluding the U.S. Restricting the sample to the years 1990-2004 leaves us with 116,411 observations.<sup>18</sup> Deleting Islamic banks and those with total assets of less than US\$ 100 million shrinks the sample to 97,690 observations. Merging these data with the corporate transparency data from Bushman et al. (2004) reduces the sample to 77,381 observations. Deleting observations with missing values

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<sup>17</sup> Sensitivity tests in Section 6.2 show that our results are robust to retaining these banks.

<sup>18</sup> We start with 1990 due to poor coverage prior to that. We end with 2004 as most countries adopt IFRS in 2005.

of the relevant variables shrinks the sample down to 62,436. The last step entails merging these data with the WDI database, which results in a final sample of 60,050 bank-year observations for 9,038 unique banks spread across 37 countries and covers the period from 1990 to 2004.

We present descriptive statistics in Table 1. In Panel A, the median bank has a profitability of 0.38% of total assets and holds capital to the tune of around 6% of assets. *ROA* volatility has a median value of 0.164, which is approximately half the bank's annual *ROA*. The capital and profitability of the median bank gives it a cushion of around 40 times its *ROA* volatility, as shown by the *ZSCORE* (represented in logs). The mean log *ZSCORE* is 3.744, with a minimum of 0.483 and a maximum of 6.679. This means profitability has to fall by 41 standard deviations ( $\exp(3.744)-1$ ) in the average bank to wipe out equity while it needs to fall by only 0.6 standard deviations ( $\exp(0.483)-1$ ) in the most risky bank. Cost efficiency (*EFFIC*) also shows wide dispersion in the sample. The lowest value of 2.477 corresponds to costs of 11% of income ( $\exp(2.477)-1$ ), while the highest value corresponds to 154%. The average bank has non-interest income that amounts to 22% of total income, as evidenced by the value of *NONINT* and has revenues growing at 1.3% annually. It also has US\$ 1.7 billion in total assets and liquid assets that amount to 32% of liquid liabilities. Close to 12% of our sample banks are publicly listed. The overall industry structure is highly dispersed, with the highest market share of any bank not exceeding 13.4%.

Turning to the country-level variables, the mean value of bank development (*BNKDEV*) expressed in logs is 0.701, which indicates private credit by the banking sector to the tune of 102% of GDP ( $\exp(0.701)-1$ ). One-third of the sample countries has experienced a banking crisis during the 1980s and 1990s. Most countries rank relatively high on creditor rights, as seen by the average *CREDRIGHTS* of 2.18 (out of 4). The average country in the sample experiences an annual GDP growth rate of 1.7% and annual inflation of 2.6%. The average (log of) market cap

of listed firms for the sample is 0.486, which translates to 63% of GDP while annual turnover is slightly higher at 77%. Finally, the average sum of imports and exports amount to 49% of GDP. Overall, the sample depicts rich heterogeneity with respect to economic characteristics such as bank size and profitability. Further, there is wide variation in macro-level factors such as financial and economic development.

Panel B presents individual summary statistics on the 37 countries in the sample. A close look at these descriptive statistics provides a preview into our main findings. The countries with the four highest scores of *CORPTRAN* are U.K., Australia, South Africa and Singapore, while those with the lowest four scores are Turkey, Greece, Philippines and India. The average *BNKDEV* for the high transparency group is 0.723 which corresponds to bank credit of 106% of GDP. The comparable value for the low transparency group is 0.268 which translates into bank credit of 31% of GDP. Further, none of the four countries in the high transparency group has faced a banking crisis compared to three out of the four countries in the low transparency group (Turkey, Philippines and India). It is ironic that the only low transparency country without a prior banking crisis is Greece!

## 4. Results

### 4.1. Bank risk-taking and corporate transparency

The first two columns of Table 2 present results of the multivariate regression of *ZSCORE* on *CORPTRAN* and controls (eq. 2). Consistent with hypothesis *H1*, the coefficient on *CORPTRAN* is negative (-0.190) and significant ( $t$ -stat = -8.78), indicating that countries with greater corporate transparency are associated with greater bank risk-taking. The effect of *CORPTRAN* is not only statistically significant but also economically meaningful. Moving from



the median level of transparency (0.229) to the upper-quartile (0.874) increases *ZSCORE* by 0.123 ( $0.645 \times 0.190$ ), which translates into an increase in bank risk-taking of 13% ( $\exp(0.123) - 1$ ).

The coefficients on the control variables are generally consistent with prior studies. Larger and more liquid banks are associated with more risk-taking. The negative coefficient on *LLP* suggests that riskier banks provide for more losses on their loan portfolio. The coefficient on *MKTSHARE* is insignificant, confirming the prior mixed evidence of the association between concentration and bank risk (e.g., Berger et al., 2008). Several of the macroeconomic variables are also significantly associated with bank risk-taking.

#### 4.2. *Cost efficiency and corporate transparency*

The next two columns of Table 2 present results of the regression of *EFFIC* on *CORPTRAN* and controls (eq. 3). Consistent with hypothesis *H2*, the coefficient on *CORPTRAN* is negative (-0.071) and significant (*t*-stat is -7.54), suggesting that corporate transparency is associated with a lower proportion of costs to income. These results are also economically significant but more modest than those for risk-taking. Improving *CORPTRAN* from the median to the upper quartile is associated with a 5% improvement in cost efficiency.

#### 4.3. *The role of lending vs. non-lending activities*

Table 3 presents results of the role of lending vs. non-lending activities in the relation between corporate transparency and risk-taking. The coefficient on *CORPTRAN\*NONINT* in Model 1 is negative (-0.210) and significant (*t*-stat = -3.32) indicating that the effect of corporate transparency on risk-taking is pronounced in banks with a greater proportion of non-interest income. Further, the standalone coefficient on *CORPTRAN* is also negative and significant suggesting that transparency is associated with higher risk-taking even in banks with only

interest income. Moving from the median level of transparency to the upper quartile increases risk-taking by 10% (i.e.,  $\exp(0.645 \cdot 0.156) - 1$ ) in a bank with only interest income (i.e., focused exclusively on lending activities), but by 18% (i.e.,  $\exp(0.645 \cdot ((0.156 \cdot 0.5) + ((0.156 + 0.210) \cdot 0.5))) - 1$ ) in one with an equal proportion of interest and non-interest income (i.e., equal emphasis on lending and non-lending activities). We interpret these results as evidence that both lending and non-lending activities contribute to bank risk-taking in countries with corporate transparency, and that the effect of the latter is pronounced.

Model 2 presents results with country fixed-effects included in the model. Although *CORPTRAN* does not vary over time within a country (and thus gets subsumed by the country effects), the within-country variation in *NONINT* allows us to identify the coefficient on *CORPTRAN\*NONINT*. This is a much more powerful test as it controls for all time-invariant country-level factors likely to be correlated with corporate transparency. We find that *CORPTRAN\*NONINT* remains negative and highly significant, providing additional assurance that our results are unlikely to be driven by country-level omitted factors.

#### 4.4. Corporate transparency and banking system performance

Table 4 presents results of the regression of each of the banking system performance measures on *CORPTRAN* and controls. As the outcome measures are defined at the country level, we collapse our sample to a country-year panel. In addition to retaining our creditor rights, macroeconomic and financial development controls, we follow Barth et al. (2008) and include country-level differences in private monitoring (*PVTMON*) and extent of official supervisory powers (*OFFPOW*).<sup>19</sup> We include *NONINT* to capture the extent to which banks indulge in non-lending activities as Barth et al. show that this variable plays an important role

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<sup>19</sup> These are obtained from the sources in Barth et al. (2001)

in bank stability and development. Finally, we follow Barth et al. and include legal origin fixed effects in all the regressions. We present two sets of specifications in each case. In the first, we exclude the financial development controls (i.e., *MKTCAP*, *TURNOVER* and *TRADE*) and retain them in the second. Our results are robust in either case.

The coefficient on *CORPTRAN* is positive and significant in the *BNKDEV* specifications and negative and significant in the *BNKCRISIS* regressions. This indicates that corporate transparency is associated with a more developed and a more stable banking sector. In terms of economic significance, moving from the lower quartile of transparency (Israel: -0.604) to the upper-quartile (Norway: 0.874) increases bank development by 8.5% ( $\exp((0.874+0.604)*0.055)-1$ ). In terms of *BNKCRISIS*, a similar move from the lower quartile to the upper-quartile reduces the likelihood of a banking crisis from 55% down to 40%. These results suggest that notwithstanding borrower transparency spurring banks' risk-taking behavior, it appears to foster a developed and stable banking sector.

## **5. Mandatory adoption of International Financial Reporting Standards (IFRS)**

Our results thus far suggest that corporate transparency is associated with bank risk taking and cost efficiency. While the evidence is suggestive of the hypothesized effect, it is also subject to several alternative interpretations stemming from endogeneity (i.e., correlated omitted variables, reverse causality etc.). A compelling research design would be to use time-series evidence and show that increases in corporate transparency *within a country* are followed by increases in risk taking and in cost efficiency by banks of that country.

The mandatory adoption of International Financial Reporting Standards (IFRS) by several countries in 2005 creates an opportunity to provide such evidence. Prior studies suggest that IFRS increases corporate transparency in adopting countries (e.g., Daske et al., 2008). This

enables industrial firms in these countries to tap overseas investors for their financing needs (e.g., DeFond et al., 2011). Our hypotheses therefore predict that banks in adopting countries would (i) increase their risk-taking behavior and (ii) enhance cost efficiency after IFRS adoption. Another advantage of this setting is that not all countries adopted IFRS, thereby providing us with a control group against which to benchmark the increases in risk-taking and cost efficiency that we might observe in adopting countries.

To test the above prediction, we obtain data on countries that adopted IFRS and those that did not from the sources in Daske et al. (2008, pg. 1100-1102). We define two indicators – *IFRS* to denote adopters vs. non-adopters and *POST* to denote the pre vs. post periods. *POST* takes the value of 1 (0) for the three years after (before) IFRS adoption, which is 2005 for all countries except Singapore, which adopted IFRS in 2003.<sup>20</sup> We drop the adoption year from both the pre and post periods. To examine the effect of IFRS adoption on bank risk-taking and cost efficiency, we estimate the following difference-in-differences specification:<sup>21</sup>

$$\begin{aligned}
OUTCOME_{i,t} = & \lambda_0 + \lambda_1 IFRS * POST_{i,t} + \lambda_2 GROWTH_{i,t} + \lambda_3 LNASSETS_{i,t} + \lambda_4 LIQUID_{i,t} \\
& + \lambda_5 LLP_{i,t} + \lambda_6 MKTSHARE_{i,t} + \lambda_7 GDP_{i,t} + \lambda_8 GDPGROWTH_{i,t} + \lambda_9 INFL_{i,t} \quad (7) \\
& + \lambda_{10} MKTCAP_{i,t} + \lambda_{11} TURNOVER_{i,t} + \lambda_{12} TRADE_{i,t} + \sum COUNTRY \\
& + \sum YEAR + \varepsilon_{i,t}
\end{aligned}$$

where, *OUTCOME* is *ZSCORE*, *EFFIC* and *BNKDEV* in each specification.<sup>22</sup> The coefficient on *IFRS* is subsumed by the country effects, while that on *POST* by the year effects and these are therefore omitted. The coefficient on the interaction term  $\lambda_1$  identifies the incremental effect of

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<sup>20</sup> Our results are robust to excluding Singapore and also to using an alternate window of five years around adoption.

<sup>21</sup> The creditor rights variable falls out as it is time-invariant and is thus subsumed by the country-effects.

<sup>22</sup> We are unable to examine the effect of IFRS adoption on bank stability as *BNKCRISIS* does not vary within each country over time.

IFRS adoption on bank risk-taking, cost efficiency and bank development of adopting countries relative to that of non-adopting countries. Our hypotheses predict a negative coefficient on  $\lambda_2$  in the *ZSCORE* and *EFFIC* regressions and a positive coefficient in the *BNKDEV* specification. All standard errors are clustered at the bank level.

Table 5 presents the results. Panel A reports descriptive statistics of adopters and non-adopters. Twenty-six countries spread across Europe and Asia adopt IFRS while twenty-three countries in the same regions do not. The three largest adopters in terms of sample size are Germany, Italy and France while Japan, Russia and Brazil are the largest non-adopters. The final sample is 29,800 bank-year observations for adopters and 12,604 for non-adopters.

Panel B presents results of the multivariate regressions. The first specification excludes the financial development controls, while the next specification includes them. The coefficient on *IFRS\*POST* is negative and significant in both the *ZSCORE* and *EFFIC* regressions, irrespective of whether or not we include the financial development controls. In terms of economic significance, the coefficient of -0.143 on *IFRS\*POST* in Model 2 suggests that bank risk-taking increases by 15.4% ( $\exp(0.143)-1$ ) in banks of adopting countries incrementally to that in banks of non-adopting countries. Turning to the *EFFIC* regressions, the coefficient of -0.037 on *IFRS\*POST* in Model 4 indicates a 3.8% ( $\exp(0.037)-1$ ) incremental increase in cost efficiency in these banks.

To shed light on how lending vs. non-lending activities contribute to this increased risk-taking, we split the sample based on whether banks increase their reliance on non-lending activities between the pre and post adoption periods. To do so, we define *NONINT\_INCR* as the percentage change in the proportion of non-interest revenue to total revenue between the post and pre periods computed for each bank. These tests are therefore restricted to a constant sample of banks (26,920 observations) that exist in both periods. We then differentiate between

banks with increases in non-lending activities ( $NONINT\_INCR > 0$ ) versus those without ( $NONINT\_INCR \leq 0$ ).<sup>23</sup> These results are presented in Panel C.

The coefficient on  $IFRS*POST$  remains negative and significant in all specifications and for both sub-samples, suggesting that both lending and non-lending activities contribute to the increased risk-taking. However, the economic significance of non-lending activities is greater than that of lending activities. In particular, risk-taking increases by 34% ( $\exp(-0.291)-1$ ) in banks with an increase in non-lending activities (i.e.,  $NONINT\_INCR > 0$ ) compared to 18% ( $\exp(-0.166)-1$ ) in those without (i.e.,  $NONINT\_INCR \leq 0$ ). Further, these values are statistically different from one another. Overall, these results suggest that banks responds to increased borrower transparency by taking on more non-lending than lending risk.

Panel D presents results of the regressions of bank development on  $IFRS*POST$  and controls.<sup>24</sup> The coefficient on  $IFRS*POST$  is positive and significant in both specifications, indicating that IFRS adoption increases bank development in adopting countries relative to that in non-adopting countries. The coefficient of 0.079 on  $IFRS*POST$  in Model 2 corresponds to an 8.2% ( $\exp(0.079)-1$ ) incremental increase in bank development, suggesting that IFRS has an economically meaningful impact on bank development. Overall, these results demonstrate the causal effect of borrower transparency on bank risk-taking, cost efficiency and bank development.

## 6. Alternative interpretations and cross-sectional variation tests

In this section, we explore three alternative interpretations for our results and discuss how we eliminate these interpretations.

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<sup>23</sup> Results are robust to splitting the sample based on the median.

<sup>24</sup> The standard errors in these regressions are clustered by country.

## 6.1. Bank transparency

Our results might be driven by differences in bank transparency rather than that of the borrowing firms. One could argue that banks in countries with greater borrower transparency might also be more transparent, which in turn might be driving the findings. This argument is unlikely to explain our results, because bank transparency, if anything, lowers risk-taking incentives (e.g., Bushman and Williams, 2012; Nier and Baumann, 2006).

To rule out this interpretation nevertheless, we control for differences in bank transparency. Our bank-level panel allows us to control for differences in bank transparency at the bank-year level. We follow Altamuro and Beatty (2010) and control for two measures of bank transparency – (i) loan loss timeliness (which we label *BANKTRAN1*), and (ii) bank income smoothing (*BANKTRAN2*). Loan loss timeliness captures the extent to which current year’s loan loss provisions are associated with next year’s loan chargeoffs. Higher this association, more timely is the loan loss provision with respect to the health of the bank’s loan portfolio; and thus greater is bank transparency. We estimate the regression of next year’s loan chargeoffs on current year loan loss provisions using rolling five-year windows, so as to maintain consistency with the risk-taking measure. We follow Altamuro and Beatty (2010) and control for bank size (using the log of total assets) and the extent of non-performing loans in these regressions. The bank income smoothing measure is based on an indicator variable that takes the value of 1 if the change in bank ROA between year  $t$  and  $t-1$  is in the interval between 0 and 0.0008. We compute *BANKTRAN2* as the average value over a five year rolling window.

Results of the above tests are presented in Table 6. While Panel A presents results based on *CORPTRAN*, Panel B presents the IFRS results. The coefficient on *CORPTRAN* remains negative and significant even after controlling for differences in bank transparency. While the coefficient on *BANKTRAN1* is insignificant, that on *BANKTRAN2* is positive and highly

significant.<sup>25</sup> We find similar results around IFRS adoption. The coefficient on *IFRS\*POST* in Panel B remains negative and significant even after controlling for bank transparency. Thus, differences in bank transparency seem unlikely to be driving our inferences.

## 6.2. Bank adoption of IFRS

A second alternative explanation is that the post-IFRS adoption increase in bank risk-taking is due to banks adopting IFRS. Thus, it could be that factors other than borrower transparency result in bank risk-taking around IFRS adoption. For example, in a recent study, DeFond, Hung, Li and Li (2011) find that IFRS adoption results in greater crash risk for banks by inducing greater volatility and allowing more opportunities for manipulation. While it is possible that their results are manifestations of the higher risk-taking incentives that we document, we perform additional tests to verify that our results are not driven by such direct effects of IFRS adoption by banks. To do so, we provide cross-sectional variation in the effect of IFRS adoption on bank risk-taking.

If the higher risk-taking is on account of IFRS adoption by our sample banks, then we expect the effect to be present in all the adopting countries. In contrast, if our results are driven by increased borrower transparency, we expect increases in bank risk-taking to be pronounced in environments where IFRS adoption increases transparency of industrial firms. Daske et al. (2008) find that IFRS adoption increases industrial firm transparency only in countries that have strong legal enforcement and where firms have incentives to be transparent. Thus, we follow Daske et al. and split our sample based on countries' level of legal enforcement and incentives to be transparent. We follow LaPorta et al. (1998) and measure legal enforcement using three

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<sup>25</sup> This result could be mechanical, given that small ROA changes lower the denominator of the risk-taking measure (i.e., ROA volatility).



variables – the efficiency of the judicial system, an assessment of the rule of law and the corruption index. We capture incentives to be transparent using the anti-self-dealing index of Djankov et al. (2008). We classify countries into high and low groups based on each of these variables and create a composite measure based on these individual ranks.<sup>26</sup> Countries below the median value of this combined measure are classified as the “Low enforcement and incentives” group, while those above the median are classified as the “High enforcement and incentives” group. We then estimate eq. (7) within each sub-sample.

These results are presented in Panel A of Table 7. We find that IFRS adoption increases bank risk-taking only in the “High enforcement and incentives” sub-sample and not in the “Low enforcement and incentives” sub-sample. This result is consistent with Daske et al. (2008) who find that IFRS adoption increases industrial firm transparency only in strong enforcement and transparency regimes. Thus, the effect of IFRS adoption on bank risk-taking appears to stem from increased borrower transparency. While one could argue that these are environments where even banks experience increases in transparency, this effect should work in the opposite direction (as noted above). Further, the fact that IFRS adoption does not increase bank risk-taking in the “Low enforcement and incentives” sub-sample rules out the possibility that the increased risk-taking is due to IFRS adoption by our sample banks.

To further address the concern that bank adoption of IFRS is driving our results, we restrict our sample to private banks. Since IFRS adoption was mandated for publicly traded firms (and banks), evidence of increased risk-taking in private banks would rule out the possibility that our results are driven by the direct effects of IFRS adoptions by banks. Panel B of Table 7 presents these results. The coefficient on *IFRS\*POST* remains negative and significant

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<sup>26</sup> Our results are robust to using the individual metrics and also to orthogonalizing the institutional variables with respect to fundamental factors such as legal origin (as in Daske et al., 2008).

within the sample of private banks and also retains its economic significance. Another advantage of this sample is that our database allows us to observe whether private banks chose to voluntarily adopt IFRS. Model 2 of Panel B includes an additional control for whether the bank chose to voluntarily adopt IFRS or retained its Local GAAP (denoted by *ACCTSTD*). We find that controlling for this self-selection does not influence our results. Overall, we conclude that our results are unlikely to be driven by the direct effects of IFRS adoption by banks.

### **6.3. IFRS adoption vs. changes in enforcement**

A recent study by Christensen et al. (2012) argues that it might be premature to attribute increases in firm transparency around IFRS to mandatory adoption alone. They note that several countries that adopted IFRS also made contemporaneous changes to enforcement and that care needs to be exercised to determine the true cause of the documented effects. To drive home their point, they split the sample of IFRS adopters into those in the European Union versus those outside and show that increases in firm liquidity are concentrated in the former group. This, they argue, shows that IFRS adoption alone is insufficient to generate increases in borrower transparency. While this debate is far from settled, we perform some preliminary tests to better understand the underlying mechanism(s) that drives our IFRS results.

First, we split our sample of treatment countries into two groups – those that are within the EU (denoted by *IFRS\_EU*) and those outside (*IFRS\_NONEU*). We then replace *IFRS\*POST* with *IFRS\_EU\*POST* and *IFRS\_NONEU\*POST*. These results are presented in Table 8. Similar to Christensen et al., we find that the effect of IFRS adoption on bank risk-taking is concentrated within the EU, indicating that IFRS adoption alone is not enough to generate the effects we document. In particular, the coefficient on *IFRS\_EU\*POST* in the first specification remains negative and significant while that on *IFRS\_NONEU\*POST* is insignificant.

Next, to verify whether changes in enforcement alone are sufficient, we modify our control group to include only Japan. This is because Christensen et al. find that Japan (a non-adopter) made changes to enforcement around this period. Thus, by benchmarking our IFRS adopters against Japan, we control for changes in enforcement and allow only IFRS adoption to vary (see Jayaraman, 2012 for a similar design). These results are presented in the second specification of Table 8. The coefficient on *IFRS\_EU* remains negative and significant, although its economic significance drops slightly. Further, the coefficient on *IFRS\_NONEU\*POST* remains insignificant. These results indicate that changes in enforcement alone are also insufficient to drive the observed effects around IFRS adoption. We summarize these results as indicating that IFRS adoption and the contemporaneous changes in enforcement appear to act as complements and reinforce each other.

## 7. Robustness tests

### 7.1. Alternative measures of bank risk-taking

We begin with assessing the robustness of our results to alternative measures of risk-taking. First, following Berger et al. (2008), we use the ratio of non-performing loans to total loans (*NPLOANS*) to capture loan portfolio risk. It is pertinent to note that *NPLOANS* captures only one component of overall bank risk-taking. If corporate transparency induces bank to take on more loan risk, then all else equal, it should be associated with a greater proportion of non-performing loans to total loans.

Panel A of Table 9 presents evidence that this is indeed the case. The coefficient on *CORPTRAN* is positive and significant in the *NPLOANS* specification, indicating that transparency is associated with greater loan risk. In unreported results, we verify that IFRS

adoption also results in increased loan risk. In particular, the coefficient on *IFRS\*POST* in the loan risk regressions is positive (coeff. = 1.647) and highly significant ( $t$ -stat = 11.92).

Second, we verify that the inverse association between *ZSCORE* and *CORPTRAN* is not due to the mechanical effect of competition on profitability (i.e., *ROA*). To do so, we re-run our results based on a re-defined measure of *ZSCORE* that excludes *ROA* (*ZSCORE\_ALT*). These results are tabulated in the specification entitled *ZSCORE\_ALT*. The coefficient on *CORPTRAN* remains negative and highly significant, indicating that our results are not being driven by the mechanical effect of greater competition on profitability.

As a final robustness test, we use risk-weighted assets instead of total assets to compute our risk-taking measures. We do not use this for our main tests, because this variable is available for a much smaller fraction of the sample. Results based on a sample of 8,976 observations are presented in the third specification entitled *ZSCORE\_RW*. The coefficient on *CORPTRAN* remains negative and significant. In unreported results, we verify that our *IFRS* results are also robust to using risk-weighted assets. The coefficient on *IFRS\*POST* remains negative (coeff. = -0.141) and significant ( $t$ -stat = -2.21) in a smaller sample of 9,743 observations.

## 7.2. *Alternate measure of corporate transparency*

We examine the sensitivity of our inferences to three alternate measures of corporate transparency. First, we define corporate transparency based on the country-level earnings management score of Leuz et al. (2003) that combines four output-based measures. We define *LNW* as this score multiplied by minus one so that larger values indicate higher transparency. Results based on this measure are presented in the first set of columns in Panel B of Table 9. The coefficient on *CORPTRAN* remains negative and significant in both the bank-risk and cost efficiency regressions. Second, we use only the *CIFAR* index as the measure of transparency and

present these results in the second set of columns in Panel B. The coefficient on *CORPTRAN* again remains negative and significant in both specifications.

Third, we use an expanded measure of transparency by including two other facets of the information environment of the country, viz., the extent of private information acquisition based on the number of analysts following large firms (*ANALYST*) and the importance of institutional investors, captured by the average ratio of the value of pooled investment schemes to GDP (*POOLINV*) (see Bushman et al., 2004 for details). We re-define *CORPTRAN* by including these two measures in the principal component extraction. We do not use this measure in our primary analysis as these measures are not available for 15 of our 37 countries. The third set of columns in Panel B of Table 9 shows that our inferences remain unaffected when using this expanded measure for the smaller sample of 22 countries. The coefficient on *CORPTRAN* remains negative and significant in the risk-taking and cost efficiency regressions. Overall, our results are robust to using alternate measures of transparency.

### 7.3. *Alternative empirical specifications*

While we cluster all our standard errors at the bank level to mitigate concerns about serial correlation, we perform additional robustness tests to further address this concern. In particular, we use only one observation per bank and estimate a cross-sectional regression based on the bank-specific mean of each variable across all years. These results are presented in Panel C1 of Table 9. The number of observations in the sample is 9,038 which corresponds to the number of unique banks. The coefficient on *CORPTRAN* remains negative and significant in both the *ZSCORE* and the *EFFIC* specifications, indicating that the statistical significance of our results is unlikely to be exaggerated in the panel regressions. Further, we estimate a regression based on one observation per country (as in Leuz et al., 2003) using the country-level mean of

each variable across all observations for that country. These results, based on 37 observations, are presented in Panel C2 of Table 9. We find that the coefficient on *CORPTRAN* remains negative and significant in both the *ZSCORE* and *EFFIC* regressions.

As an additional robustness test, we re-estimate our primary regressions by clustering our standard errors in two different ways – by country-year and by country. These results are presented in Panel C3 of Table 9. The coefficient on *CORPTRAN* remains negative and highly significant in both the *ZSCORE* and *EFFIC* regressions and also under both ways of clustering. Finally, we perform a two-way clustering of standard errors (by bank and year). In unreported results, we find that the coefficient on *CORPTRAN* remains negative and significant in both the *ZSCORE* and *EFFIC* regressions (*t*-stats of -4.11 and -6.59 respectively).

#### 7.4. Falsification tests

Next, we run several falsification tests to further verify the robustness of our results. First, we assign countries a randomly generated transparency score denoted by *PCORPTRAN* and run our primary regressions using this measure. We perform this iteration 1,000 times and gauge the statistical significance of our results using the distribution of the coefficients. Results, presented in Panel D1 of Table 9 show that the coefficient on *PCORPTRAN* is insignificant in both the *ZSCORE* and *EFFIC* regressions (with *t*-stats of -0.05 and 0.01 respectively).

Turning to the IFRS tests, one concern is that the results could be reflecting ongoing time trends rather than a one-time shock. For example, if banks in IFRS adopting countries had been increasing risk-taking even prior to 2005 and if this increase was not matched by non-adopting countries, then our tests might simply be picking up this time-trend. To mitigate this concern, we create a pseudo shock where we back-date the actual date of IFRS adoption by four years

and re-estimate our tests using these pseudo pre and post periods (*PPOST*).<sup>27</sup> These tests are reported in Panel D2 and Panel D3 of Table 9. There is no evidence of higher risk-taking or of greater cost efficiency around this pseudo shock period. In particular, the coefficient on *IFRS\*PPOST* in Panel D2 is either insignificant or positive in the specifications. Further, *IFRS\*PPOST* is insignificant in the bank development regressions of Panel D3 as well, providing additional evidence that our IFRS results are not driven by ongoing time trends.

#### 7.5. *Competition on the liability side*

We examine the robustness of our results to including banks' interest cost as an additional control for competition on the liability side of the balance sheet (Hellman et al., 2000). Results presented in Panel E of Table 9 indicate that the coefficient on *CORPTRAN* remains negative and significant. Thus, the effect of transparency on bank risk-taking is robust to controlling for differences in interest costs. In unreported tests, we verify that the effect of IFRS adoption on bank risk-taking is also robust to controlling for differences in interest costs. The coefficient on *IFRS\*POST* remains negative (-0.143) and highly significant (*t*-stat of -4.50).

#### 7.6. *Non-overlapping windows*

One concern with the *ZSCORE* measure is that it might induce serial correlation as it is constructed based on overlapping windows of five years. To mitigate this concern, we examine the robustness of our results to constructing *ZSCORE* based on non-overlapping windows. In particular, we use the windows 1990-1995, 1996-2000 and 2001-2004 to construct *ZSCORE*. We use the average values of *CORPTRAN* and the controls over these periods as the explanatory

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<sup>27</sup> We choose four years to ensure no overlap with the actual dates. Our results are, however, robust to choosing alternate years as the pseudo adoption date.

variables. Results in Panel F of Table 9 (based on 13,813 bank-year observations) show that *CORPTRAN* remains negative and significant in both the *ZSCORE* and the *EFFIC* regressions. Thus, our results are not confounded by the use of overlapping windows to construct *ZSCORE*.

#### 7.7. Including small banks

We check whether our results are robust to including small banks (i.e., those with total assets of less than US\$100 million). Panel G of Table 9 indicates that the results are robust to including these banks. In particular, the coefficient on *CORPTRAN* remains negative and significant in both the *ZSCORE* and the *EFFIC* regressions. In unreported results, we verify that the IFRS tests are also robust to including small banks.

#### 7.8. Including U.S. banks

We examine the sensitivity of our results to including U.S. data. There are some caveats with regard to the bank-level tests. First, U.S. bank coverage on Bankscope appears to vary significantly across time periods. Second, these data are only a sub-set of the Federal Reserve database for U.S. banks. These results should therefore be interpreted cautiously. On the other hand, the bank development measures obtained from the WDI database are comparable across the U.S. and the remaining countries (the same is the case with *BNKCRISIS*). Panel H of Table 9 presents these results. Panel H1 presents the bank-level analysis, where the coefficient on *CORPTRAN* remains negative and significant in both the *ZSCORE* as well as the *EFFIC* regressions. Turning to the country-level results in Panel H2, the coefficient on *CORPTRAN* remains positive and significant in the *BNKDEV* regressions and negative and significant in the *BNKCRISIS* regressions. Thus, even the country-level analyses are robust to including U.S. data.



## 8. Conclusion

We provide evidence of a causal link from transparency in the industrial sector to economic outcomes in the banking sector. Borrower transparency enables borrowing firms in a country to avail of financing from arm's-length financial markets and thereby induces greater competition between banks and these alternative financing sources. Our study focuses on how banks respond to these higher competitive pressures in their product markets.

We find that banks take on more risk and reduce costs in an effort to stay competitive in this environment. The increases in risk-taking seem to emanate both from lending as well as non-lending activities, with the relative importance of the latter being greater than that of the former. We also find that corporate transparency leads to a more developed banking sector and one that is less susceptible to a banking crisis. These results provide suggestive evidence that the actions taken by banks in response to borrower transparency do not compromise, but rather reinforce the stability of the banking sector.

To mitigate concerns about endogeneity, we use the mandatory adoption of International Financial Reporting Standards (IFRS) as a shock to transparency and provide consistent time-series evidence. In particular, we find that risk-taking and cost cutting in banks of IFRS adopting countries increases after adoption and that these increases are incremental to those in non-adopting countries. We find that bank development of adopting countries also increases after adoption and again, is greater than that of non-adopting countries. These tests provide stronger causal evidence in favor of our story.

In addition to documenting real effects of financial reporting on the banking sector, our study provides novel evidence of transmission mechanisms that emanate from the industrial sector and transmit to the banking sector. The policy implications of these findings are promising and a fruitful avenue for future research.

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**Table 1: Descriptive statistics****Panel A: Entire sample**

The sample covers the period from 1990 to 2004 and comprises data for 9,038 unique banks across 37 countries. *ROA* represents bank profitability (in percentage) and is defined as net income divided by assets. *CAR* denotes the capital ratio (in percentage) and is defined as capital divided by assets. *ROAVOL* represents *ROA* volatility and is defined as the standard deviation of five annual *ROA* observations. *ZSCORE* is the inverse measure of bank risk where lower values denote higher risk. It is computed as (the log of) return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *EFFIC* represents the (log of the) ratio of overhead costs to revenues. *NONINT* is the ratio of non-interest income to total income. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CORPTRAN* captures the overall measure of corporate transparency. *BNKDEV* denotes bank development and is measured as the (log of the) ratio of bank credit to the private sector to GDP. *BNKCRISIS* is an indicator variable that denotes whether the country experienced a banking crisis during the late 1980s or 1990s. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents the log of Gross Domestic Product. *GDPGROWTH* and *INFL* represent the annual GDP growth and inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, turnover of listed firms and total of exports and imports respectively, each divided by GDP.

	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
<b><u>Firm-level:</u></b>						
<i>ROA</i> (%)	60,050	0.689	0.380	1.365	-3.690	7.740
<i>CAR</i> (%)	60,050	8.798	5.967	9.006	1.094	62.192
<i>ROAVOL</i>	60,050	0.547	0.164	1.079	0.007	6.894
<i>ZSCORE</i>	60,050	3.744	3.801	1.283	0.483	6.679
<i>EFFIC</i>	60,050	4.121	4.208	0.419	2.477	5.042
<i>NONINT</i>	59,821	0.221	0.180	0.225	-0.266	0.997
<i>GROWTH</i>	60,050	0.013	-0.018	0.296	-0.783	1.696
<i>LNASSETS</i>	60,050	7.424	7.099	1.812	4.737	12.583
<i>LIQUID</i>	60,050	0.319	0.201	0.341	0.004	2.123
<i>LLP</i>	60,050	0.150	0.123	0.334	-0.425	1.912
<i>LISTED</i>	60,050	0.121	0.000	0.326	0.000	1.000
<i>MKTSHARE</i>	60,050	0.006	0.000	0.020	0.000	0.134

**Panel A: Entire sample (cont' d)**

	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
<b><u>Country-level:</u></b>						
<i>CORPTRAN</i>	60,050	0.024	-0.139	0.669	-2.068	1.519
<i>BNKDEV</i>	59,287	0.701	0.724	0.219	0.143	1.170
<i>BNKCRISIS</i>	57,815	0.337	0.000	0.473	0.000	1.000
<i>CREDRIGHTS</i>	60,050	2.175	2.000	1.101	0.000	4.000
<i>GDP</i>	60,050	6.657	7.037	1.160	3.991	8.494
<i>GDPGROWTH</i>	60,050	0.017	0.017	0.017	-0.026	0.076
<i>INFL</i>	60,050	0.026	0.016	0.044	-0.018	0.315
<i>MKTCAP</i>	60,050	0.486	0.433	0.278	0.097	1.398
<i>TURNOVER</i>	60,050	0.569	0.575	0.222	0.072	1.155
<i>TRADE</i>	60,050	0.402	0.367	0.189	0.132	1.250

**Panel B: By country:**

*CIFAR*, *GOVERN*, *PRINCIPLE*, *TIME* and *AUDIT* denote the constituents of *CORPTRAN*. *BNKDEV* is bank credit to the private sector scaled by GDP. *BNKCRISIS* denotes whether the country experienced a banking crisis during the 1980s or 1990s.

Country	Obs.	CIFAR	GOVERN	PRINCIPLE	TIME	AUDIT	CORP TRAN	BNKDEV	BNK CRISIS
Australia	963	80	93.84	100.00	89.13	4	1.33	0.58	0
Austria	1,638	62	78.99	68.48	68.12	3	-0.48	0.71	0
Belgium	1,151	68	76.45	39.13	63.04	3	-0.56	0.55	0
Brazil	1,449	56	65.94	100.00	86.96	3	-0.62	0.30	1
Canada	536	75	65.58	76.09	99.28	4	0.39	0.80	1
Chile	417	78	76.45	100.00	94.20	4	0.89	0.50	1
Colombia	384	58	65.58	22.83	62.32	3	-1.34	0.26	.
Denmark	1,066	75	76.81	68.48	73.91	4	0.35	0.60	1
Finland	230	83	89.49	68.48	78.99	4	1.02	0.49	1
France	5,590	78	65.58	70.65	78.26	3	-0.05	0.62	0
Germany	16,540	67	72.83	39.13	68.12	4	-0.32	0.75	0
Greece	388	61	65.58	100.00	17.39	1	-1.76	0.35	0
Hong Kong	721	73	91.30	100.00	69.57	4	0.79	0.93	.
India	681	61	76.45	54.35	45.65	1	-1.54	0.25	1
Ireland	411	81	91.67	100.00	69.57	4	1.12	0.71	0
Israel	273	74	65.58	76.09	66.67	2	-0.60	0.56	0
Italy	5,638	66	65.58	68.48	86.96	4	-0.14	0.53	1
Japan	5,291	71	82.61	36.13	86.23	4	0.23	1.10	1
Korea	439	68	77.90	39.13	17.39	3	-0.99	0.54	1
Malaysia	870	79	96.74	100.00	65.22	3	0.80	0.86	1
Mexico	495	71	65.58	100.00	84.78	3	-0.06	0.18	1
Netherlands	828	74	85.87	46.74	78.26	4	0.42	0.78	0
New Zealand	189	80	94.57	100.00	68.12	4	1.13	0.70	0
Nigeria	394	70	84.06	68.48	17.39	3	-0.56	0.14	1
Norway	769	75	90.22	68.48	94.20	4	0.87	0.52	.
Pakistan	248	73	92.75	46.74	51.45	2	-0.36	0.22	.
Philippines	486	64	65.58	23.91	75.36	1	-1.59	0.31	1
Portugal	670	56	70.29	70.65	62.32	3	-0.97	0.67	0
Singapore	379	79	100.00	100.00	63.77	4	1.18	0.71	0
South Africa	414	79	94.20	100.00	86.96	4	1.27	0.79	0
Spain	2,716	72	79.71	100.00	89.13	4	0.68	0.64	0
Sweden	610	83	96.74	39.13	86.23	4	1.06	0.67	1
Switzerland	3,382	80	86.96	68.48	73.91	3	0.47	0.95	0
Thailand	434	66	68.12	23.91	89.13	3	-0.68	0.78	1
Turkey	434	58	67.03	68.48	17.39	1	-2.07	0.16	1
United Kingdom	2,813	85	94.57	100.00	86.96	4	1.52	0.81	0
Zimbabwe	113	72	87.68	100.00	60.87	4	0.58	0.39	.

**Table 2: Effect of corporate transparency on risk-taking and cost efficiency**

The dependent variable in the first specification is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *CORPTRAN* is the measure of corporate transparency. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.765	28.85	4.166	90.12
<i>CORPTRAN</i>	-0.190	-8.78	-0.071	-7.54
<i>GROWTH</i>	0.011	0.60	-0.100	-10.51
<i>LNASSETS</i>	-0.038	-5.31	-0.038	-13.95
<i>LIQUID</i>	-0.383	-11.71	-0.046	-3.16
<i>LLP</i>	-0.603	-19.86	0.076	5.88
<i>LISTED</i>	-0.115	-3.01	0.022	1.72
<i>MKTSHARE</i>	-0.612	-0.98	2.281	10.54
<i>CREDRIGHTS</i>	0.087	7.37	0.007	1.34
<i>GDP</i>	0.100	6.99	0.062	12.09
<i>GDPGROWTH</i>	-8.261	-16.12	-1.093	-5.38
<i>INFL</i>	-3.896	-15.95	-0.705	-7.40
<i>MKTCAP</i>	0.268	4.30	0.016	0.71
<i>TURNOVER</i>	0.726	14.26	-0.056	-3.08
<i>TRADE</i>	0.484	5.91	-0.289	-8.29
Year effects	Yes		Yes	
Adj. $R^2$	0.14		0.12	
Obs.	60,050		60,050	



**Table 3: Role of lending vs. non-lending activities in bank risk-taking**

The dependent variable in both specifications is *ZSCORE* which is the inverse measure of bank risk where lower values denote higher risk. *CORPTRAN* captures the overall measure of corporate transparency. *NONINT* indicates the ratio of non-interest income to total income. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets of the bank. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank. In addition, Model 2 includes country fixed effects.

	<i>ZSCORE</i> (Model 1)		<i>ZSCORE</i> (Model 2)	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.870	29.61	-6.665	-4.52
<i>CORPTRAN</i>	-0.156	-6.17	-	-
<i>CORPTRAN*NONINT</i>	-0.210	-3.32	-0.413	-6.99
<i>NONINT</i>	-0.382	-7.43	-0.729	-14.50
<i>GROWTH</i>	0.016	0.87	0.089	5.34
<i>LNASSETS</i>	-0.037	-5.21	0.004	0.59
<i>LIQUID</i>	-0.326	-9.98	-0.373	-11.71
<i>LLP</i>	-0.609	-20.05	-0.508	-18.55
<i>LISTED</i>	-0.122	-3.20	0.101	2.94
<i>MKTSHARE</i>	-0.454	-0.75	0.357	0.64
<i>CREDRIGHTS</i>	0.084	7.12	-	-
<i>GDP</i>	0.088	6.12	1.779	7.93
<i>GDPGROWTH</i>	-8.647	-16.84	1.076	2.44
<i>INFL</i>	-3.954	-16.13	1.119	5.11
<i>MKTCAP</i>	0.371	5.83	0.339	4.22
<i>TURNOVER</i>	0.782	15.34	0.121	2.50
<i>TRADE</i>	0.473	5.80	-2.063	-7.18
Year effects	Yes		Yes	
Country effects	No		Yes	
Adj. R <sup>2</sup>	0.14		0.26	
Obs.	59,821		59,821	

**Table 4: Effect of corporate transparency on banking development and bank fragility**

The dependent variable in the first specification is *BNKDEV* which represents bank development and is computed as the log of ratio of bank credit to the private sector scaled by GDP. The dependent variable in the second (probit) specification is *BNKCRISIS* which is an indicator variable that denotes whether or not the country had a banking crisis during the late 1980s and 1990s. *CORPTRAN* captures the overall measure of corporate transparency. *NONINT* indicates the ratio of non-interest income to total income. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and legal origin fixed effects and robust standard errors.

	<i>BNKDEV</i>				Pr ( <i>BNKCRISIS</i> =1)			
	Model 1		Model 2		Model 3		Model 4	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	0.236	2.83	-0.021	-0.23	0.970	1.59	0.833	1.11
<i>CORPTRAN</i>	0.081	9.28	0.055	5.63	-0.336	-3.62	-0.367	-3.56
<i>NONINT</i>	-0.137	-1.64	-0.369	-4.81	-3.831	-6.29	-3.638	-5.57
<i>PVTMON</i>	0.011	1.41	0.005	0.64	0.022	0.34	0.033	0.51
<i>OFFPOW</i>	0.015	4.50	0.022	7.01	-0.051	-1.85	-0.059	-2.12
<i>CREDRIGHTS</i>	-0.001	-0.14	-0.001	-0.16	-0.395	-5.69	-0.383	-5.30
<i>GDP</i>	0.047	5.98	0.052	5.85	0.017	0.27	0.053	0.74
<i>GDPGROWTH</i>	-0.535	-1.53	-1.548	-4.64	9.069	3.16	9.994	3.23
<i>INFL</i>	-1.175	-9.54	-1.021	-8.48	6.230	5.67	6.212	5.63
<i>MKTCAP</i>			0.254	7.32			-0.048	-0.15
<i>TURNOVER</i>			0.120	3.52			-0.384	-1.19
<i>TRADE</i>			0.166	4.93			0.084	0.23
Year effects	Yes		Yes		Yes		Yes	
Origin effects	Yes		Yes		Yes		Yes	
Adj./Pseudo <i>R</i> <sup>2</sup>	0.51		0.60		0.28		0.28	
Obs.	458		458		462		462	

**Table 5: Changes in risk-taking and cost efficiency around mandatory IFRS adoption**

**Panel A: List of adopting and non-adopting countries**

The list of IFRS adopters and non-adopters is from Daske et al. (2008, pg. 1100-1102). The adoption date of IFRS for Singapore is 2003 and for all other countries is 2005. The sample period comprises of the three years before and three years after the year of adoption (excluding the transition year).

<b>IFRS adopters</b>	<b>Obs.</b>	<b>Non-adopters</b>	<b>Obs.</b>
Australia	423	Argentina	370
Austria	1,471	Bermuda	61
Belgium	522	Brazil	928
Czech Republic	193	Canada	400
Denmark	713	Chile	190
Finland	142	China	532
France	2,885	Colombia	205
Germany	9,277	Egypt	200
Greece	200	India	549
Hong Kong	335	Indonesia	335
Hungary	230	Israel	135
Ireland	305	Japan	4,762
Italy	3,766	Korea	273
Luxembourg	647	Malaysia	550
Netherlands	438	Mexico	313
Norway	747	Morocco	117
Philippines	283	New Zealand	96
Poland	290	Pakistan	217
Portugal	302	Peru	162
Singapore	200	Russia	1,416
South Africa	201	Sri Lanka	128
Spain	1,259	Thailand	284
Sweden	576	Turkey	381
Switzerland	2,567		
United Kingdom	1,696		
Venezuela	132		
<b>Total</b>	<b>29,800</b>	<b>Total</b>	<b>12,604</b>

**Panel B: Effect of mandatory IFRS adoption on bank risk-taking and cost efficiency**

The dependent variable in the first specification is *ZSCORE* where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the ratio of overhead costs to revenues. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>				<i>EFFIC</i>			
	Model 1		Model 2		Model 3		Model 4	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-0.568	-0.51	-2.591	-2.19	4.889	11.38	5.528	11.79
<i>IFRS*POST</i>	-0.160	-5.10	-0.143	-4.56	-0.027	-2.41	-0.037	-3.25
<i>GROWTH</i>	0.132	6.52	0.134	6.59	-0.077	-6.88	-0.076	-6.84
<i>LNASSETS</i>	-0.033	-4.86	-0.033	-4.80	-0.041	-15.47	-0.041	-15.47
<i>LIQUID</i>	-0.004	-16.09	-0.004	-16.09	0.000	-1.11	0.000	-1.10
<i>LLP</i>	-0.004	-10.78	-0.004	-10.67	0.001	5.87	0.001	5.76
<i>LISTED</i>	0.031	0.99	0.030	0.96	0.023	1.82	0.023	1.81
<i>MKTSHARE</i>	0.590	0.90	0.594	0.90	1.559	6.27	1.549	6.24
<i>GDP</i>	0.664	3.85	0.902	5.06	-0.116	-1.75	-0.184	-2.61
<i>GDPGROWTH</i>	-2.302	-3.81	-3.219	-5.32	0.497	1.93	0.903	3.39
<i>INFL</i>	0.449	1.22	0.150	0.40	0.033	0.21	0.157	1.01
<i>MKTCAP</i>			-0.113	-1.44			-0.096	-2.54
<i>TURNOVER</i>			-0.185	-3.40			-0.050	-2.27
<i>TRADE</i>			1.671	6.05			-0.336	-2.98
Year effects	Yes		Yes		Yes		Yes	
Country effects	Yes		Yes		Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.22		0.22		0.16		0.17	
Obs.	42,404		42,404		42,404		42,404	

### Panel C: Role of lending vs. non-lending activities on bank risk-taking

This panel presents results for sub-samples based on whether the proportion of non-interest revenue to total revenue increases between the pre and post periods. *NONINT\_INCR>0* (*NONINT\_INCR<=0*) denotes banks with more (less or equal) non-interest income in the post period than the pre. The dependent variable is *ZSCORE* where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the ratio of overhead costs to revenues. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	<i>NONINT_INCR&gt;0</i>		<i>NONINT_INCR&lt;=0</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	7.583	3.71	4.261	1.94
<i>IFRS*POST</i>	-0.291	-6.14	-0.166	-3.35
<i>GROWTH</i>	0.100	2.34	0.124	3.94
<i>LNASSETS</i>	-0.012	-0.93	-0.046	-2.92
<i>LIQUID</i>	-0.006	-9.94	-0.002	-4.59
<i>LLP</i>	-0.006	-9.72	-0.002	-3.82
<i>LISTED</i>	-0.012	-0.19	0.007	0.13
<i>MKTSHARE</i>	-1.910	-1.20	0.032	0.03
<i>GDP</i>	-0.592	-2.01	-0.010	-0.04
<i>GDPGROWTH</i>	0.892	0.87	-4.113	-4.80
<i>INFL</i>	0.479	0.72	0.304	0.50
<i>MKTCAP</i>	-0.364	-2.85	-0.279	-2.35
<i>TURNOVER</i>	-0.302	-2.24	-0.598	-4.44
<i>TRADE</i>	1.903	4.23	1.215	2.71
<i>p. value of diff in IFRS*POST</i>	0.069			
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. R <sup>2</sup>	0.28		0.15	
Obs.	17,051		9,869	

### Panel D: Effect of mandatory IFRS adoption on bank development

The dependent variable is *BNKDEV* which represents bank development and is computed as the log of ratio of bank credit to the private sector scaled by GDP. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods. These are defined as the three years around IFRS adoption, but excluding the year of adoption. *NONINT* indicates the ratio of non-interest income to total income. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by country.

	<i>BNKDEV</i> (Model 1)		<i>BNKDEV</i> (Model 2)	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	0.857	1.14	1.104	1.68
<i>IFRS*POST</i>	0.070	2.61	0.079	2.82
<i>NONINT</i>	-0.003	-0.02	0.022	0.18
<i>GDP</i>	-0.029	-0.20	-0.064	-0.48
<i>GDPGROWTH</i>	-0.714	-2.50	-0.609	-2.62
<i>INFL</i>	-0.609	-3.96	-0.588	-4.27
<i>MKTCAP</i>			0.033	0.63
<i>TURNOVER</i>			-0.081	-1.69
<i>TRADE</i>			-0.082	-0.33
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. $R^2$	0.97		0.97	
Obs.	284		284	

**Table 6: Does bank transparency explain the higher risk-taking?**

**Panel A: CORPTRAN results**

The dependent variable is *ZSCORE*, the inverse measure of bank risk-taking. *CORPTRAN* captures corporate transparency. *BANKTRAN1* and *BANKTRAN2* denote bank transparency. The former indicates loan loss timeliness and is measured as the extent to which current period loan loss provisions correlate with future period chargeoffs. The latter captures income smoothing and is defined as an indicator variable that takes 1 when the bank reports an earnings change between 0 and 0.0008. Both measures are defined over the same interval as *ZSCORE*. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year effects and robust standard errors clustered by bank.

	<i>ZSCORE</i> (Model 1)		<i>ZSCORE</i> (Model 2)	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.737	28.23	3.930	30.25
<i>CORPTRAN</i>	-0.210	-9.55	-0.168	-7.85
<i>BANKTRAN1</i>	-0.003	-0.28	-0.002	-0.21
<i>BANKTRAN2</i>			2.020	26.74
<i>GROWTH</i>	0.005	0.26	0.006	0.33
<i>LNASSETS</i>	-0.026	-3.76	-0.031	-4.62
<i>LIQUID</i>	-0.341	-9.85	-0.332	-10.20
<i>LLP</i>	-0.861	-29.64	-0.847	-29.99
<i>LISTED</i>	-0.112	-3.04	-0.073	-2.06
<i>MKTSHARE</i>	-0.859	-1.42	-0.908	-1.52
<i>CREDRIGHTS</i>	0.109	9.00	0.094	8.04
<i>GDP</i>	0.110	7.68	0.079	5.66
<i>GDPGROWTH</i>	-8.796	-16.77	-8.002	-15.75
<i>INFL</i>	-3.878	-15.77	-3.503	-14.47
<i>MKTCAP</i>	0.392	6.13	0.350	5.80
<i>TURNOVER</i>	0.660	13.29	0.636	13.11
<i>TRADE</i>	0.397	4.60	0.312	3.72
Year effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.16		0.20	
Obs.	56,569		56,569	

## Panel B: IFRS results

The dependent variable in both specifications is *ZSCORE*, the inverse measure of bank risk. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *BANKTRAN1* and *BANKTRAN2* are two measures of bank transparency. The former indicates loan loss timeliness and is measured as the extent to which current period loan loss provisions correlated with future period loan chargeoffs. The latter captures income smoothing and is defined as an indicator variable that takes the value of 1 when the bank reports an earnings change between 0 and 0.0008. Both measures are defined over the same interval as *ZSCORE*. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i> (Model 1)		<i>ZSCORE</i> (Model 2)	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-3.513	-2.81	-3.609	-2.93
<i>IFRS*POST</i>	-0.130	-3.98	-0.160	-5.01
<i>BANKTRAN1</i>	0.001	0.40	0.000	0.10
<i>BANKTRAN2</i>			2.271	31.19
<i>GROWTH</i>	0.128	5.66	0.128	5.77
<i>LNASSETS</i>	-0.024	-3.50	-0.022	-3.28
<i>LIQUID</i>	-0.004	-14.56	-0.004	-14.84
<i>LLP</i>	-0.006	-18.14	-0.006	-18.20
<i>LISTED</i>	0.023	0.74	0.052	1.70
<i>MKTSHARE</i>	0.183	0.27	0.156	0.24
<i>GDP</i>	1.043	5.55	1.033	5.60
<i>GDPGROWTH</i>	-3.569	-5.68	-4.325	-6.99
<i>INFL</i>	0.047	0.12	-0.060	-0.16
<i>MKTCAP</i>	-0.176	-2.18	-0.137	-1.71
<i>TURNOVER</i>	-0.176	-3.19	-0.106	-1.94
<i>TRADE</i>	1.568	5.36	1.433	4.98
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. R <sup>2</sup>	0.24		0.29	
Obs.	39,689		39,689	



**Table 7: Cross-sectional variation in the effect of IFRS adoption on bank risk-taking**

**Panel A: Role of enforcement and incentives**

The dependent variable is *ZSCORE*, the inverse measure of bank risk. Enforcement and incentives are defined at the country-level, where enforcement is defined as the mean score across three legal variables: the efficiency of the judicial system, the extent of rule of law and the corruption index. Incentives are defined at the extent to which there are mechanisms in place to prevent self-dealing by insiders. The low and high groups are based on the combined values of enforcement and incentives. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	Low enforcement and incentives		High enforcement and incentives	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-11.892	-5.83	-8.238	-2.05
<i>IFRS*POST</i>	0.038	0.62	-0.203	-4.25
<i>GROWTH</i>	0.074	2.65	0.180	5.03
<i>LNASSETS</i>	-0.020	-2.16	-0.045	-4.15
<i>LIQUID</i>	-0.004	-10.35	-0.006	-13.25
<i>LLP</i>	-0.001	-2.84	-0.007	-12.79
<i>LISTED</i>	0.012	0.26	0.062	1.26
<i>MKTSHARE</i>	-0.299	-0.28	1.353	1.37
<i>GDP</i>	2.226	7.60	1.707	2.84
<i>GDPGROWTH</i>	-6.618	-8.50	-4.831	-3.58
<i>INFL</i>	0.482	1.02	1.539	1.97
<i>MKTCAP</i>	0.064	0.45	0.571	3.19
<i>TURNOVER</i>	0.105	1.60	-0.095	-0.81
<i>TRADE</i>	1.961	5.14	1.717	2.58
<i>p. value of diff in IFRS*POST</i>	0.002			
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.26		0.16	
Obs.	23,390		15,528	

## Panel B: Private Banks

The sample is restricted to private banks (i.e., those that are not listed in their respective countries). The dependent variable is *ZSCORE*, the inverse measure of bank risk. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *ACCTSTD* is an indicator variable that denotes whether the private bank reports under Local GAAP or under IFRS. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	Model 1		Model 2	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-1.197	-0.77	-1.230	-0.84
<i>IFRS*POST</i>	-0.127	-3.44	-0.148	-3.87
<i>ACCTSTD</i>			0.062	1.76
<i>GROWTH</i>	0.139	6.29	0.139	6.28
<i>LNASSETS</i>	-0.034	-4.56	-0.035	-4.72
<i>LIQUID</i>	-0.004	-14.37	-0.004	-14.37
<i>LLP</i>	-0.004	-9.69	-0.004	-9.72
<i>MKTSHARE</i>	-0.987	-1.02	-0.996	-1.03
<i>GDP</i>	0.718	3.16	0.726	3.18
<i>GDPGROWTH</i>	-2.252	-3.04	-1.925	-2.56
<i>INFL</i>	0.958	2.15	1.052	2.34
<i>MKTCAP</i>	-0.114	-1.27	-0.087	-0.96
<i>TURNOVER</i>	-0.181	-3.08	-0.172	-2.93
<i>TRADE</i>	1.580	4.74	1.665	4.97
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.22		0.22	
Obs.	35,587		35,587	

**Table 8: IFRS adoption vs. changes in enforcement**

The dependent variable is *ZSCORE*, the inverse measure of bank risk. *IFRS\_EU* (*IFRS\_NONEU*) denotes IFRS adopting countries that are within (outside) the European Union. *POST* indicates the pre vs. post adoption periods, defined as the three years around IFRS adoption, excluding the year of adoption. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	All control countries		Only Japan	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-1.573	-1.29	-4.669	-1.87
<i>IFRS_EU*POST</i>	-0.190	-5.75	-0.175	-4.26
<i>IFRS_NONEU*POST</i>	-0.025	-0.48	-0.002	-0.03
<i>GROWTH</i>	0.134	6.60	0.141	5.28
<i>LNASSETS</i>	-0.032	-4.77	-0.026	-3.40
<i>LIQUID</i>	-0.004	-16.09	-0.005	-15.54
<i>LLP</i>	-0.004	-10.61	-0.004	-10.13
<i>LISTED</i>	0.030	0.96	-0.008	-0.19
<i>MKTSHARE</i>	0.570	0.86	0.130	0.16
<i>GDP</i>	0.760	4.15	1.133	3.13
<i>GDPGROWTH</i>	-3.266	-5.40	-2.755	-3.14
<i>INFL</i>	-0.203	-0.54	-2.692	-4.45
<i>MKTCAP</i>	-0.143	-1.82	0.335	2.88
<i>TURNOVER</i>	-0.190	-3.51	0.015	0.26
<i>TRADE</i>	1.742	6.30	2.335	5.60
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.22		0.17	
Obs.	42,404		34,562	

**Table 9: Robustness tests****Panel A: Alternative measures of bank risk-taking**

The dependent variable in the first specification is the ratio of non-performing loans to total loans (*NPLOANS*). The dependent variable in the next two specifications is the original *ZSCORE* measure modified to exclude *ROA* (*ZSCORE\_ALT*) and defined using risk-weighted assets (*ZSCORE\_RW*) respectively. *CORPTRAN* captures the overall measure of corporate transparency. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets of the bank. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>NPLOANS</i>		<i>ZSCORE_ALT</i>		<i>ZSCORE_RW</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-0.386	-0.99	3.569	27.58	4.623	13.08
<i>CORPTRAN</i>	0.222	3.06	-0.187	-8.79	-0.144	-2.68
<i>GROWTH</i>	0.077	1.24	-0.025	-1.44	-0.270	-4.48
<i>LNASSETS</i>	0.038	1.91	-0.041	-5.85	-0.094	-6.63
<i>LIQUID</i>	0.367	4.27	-0.381	-11.63	-0.402	-4.36
<i>LLP</i>	2.317	21.10	-0.482	-16.83	-1.053	-15.43
<i>LISTED</i>	1.222	9.42	-0.110	-2.98	-0.036	-0.61
<i>MKTSHARE</i>	4.172	1.63	-0.722	-1.18	1.355	1.37
<i>CREDRIGHTS</i>	-0.007	-0.21	0.080	6.86	0.155	4.34
<i>GDP</i>	0.197	4.25	0.124	8.74	0.072	2.16
<i>GDPGROWTH</i>	24.255	13.52	-8.383	-16.54	-9.428	-7.83
<i>INFL</i>	11.138	10.67	-4.102	-16.86	5.076	5.05
<i>MKTCAP</i>	-0.718	-4.74	0.250	3.99	0.261	1.59
<i>TURNOVER</i>	-4.146	-18.96	0.701	14.22	0.253	1.81
<i>TRADE</i>	-2.102	-6.57	0.527	6.49	-0.371	-1.92
Year effects	Yes		Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.15		0.14		0.16	
Obs.	60,050		60,050		8,976	

**Panel B: Alternate measures of corporate transparency**

The measure of corporate transparency in the first specification is the *CIFAR* score while that in the second specification is a principal component of the indices of *CORPTRAN* and also *ANALYST* and *POOLINV*. *ANALYST* and *POOLINV* capture the importance of analyst following and institutional investors in the country. All other variables are defined similar to those in Table 2.

	<i>LNW</i>				<i>CIFAR</i>				$f(\text{CORPTRAN, ANALYST, POOLINV})$			
	<i>ZSCORE</i>		<i>EFFIC</i>		<i>ZSCORE</i>		<i>EFFIC</i>		<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	2.973	19.80	4.138	73.33	4.666	22.96	4.549	55.16	2.476	15.14	4.145	64.70
<i>CORPTRAN</i>	-0.029	-13.09	-0.007	-8.50	-0.013	-6.07	-0.006	-5.87	-0.198	-6.85	-0.059	-4.49
<i>GROWTH</i>	0.013	0.65	-0.084	-7.80	0.013	0.73	-0.099	-10.40	0.010	0.50	-0.103	-8.91
<i>LNASSETS</i>	-0.039	-5.22	-0.041	-14.35	-0.042	-6.02	-0.040	-14.55	-0.011	-1.33	-0.036	-10.96
<i>LIQUID</i>	-0.432	-11.77	-0.043	-2.78	-0.388	-11.72	-0.048	-3.31	-0.435	-12.38	-0.058	-3.63
<i>LLP</i>	-0.655	-20.59	0.062	4.65	-0.598	-19.74	0.078	6.01	-0.311	-8.38	0.120	6.76
<i>LISTED</i>	-0.139	-3.32	0.016	1.12	-0.094	-2.48	0.030	2.29	-0.011	-0.24	0.013	0.68
<i>MKTSHARE</i>	-0.327	-0.45	2.583	10.61	-0.430	-0.69	2.350	10.76	-1.901	-2.46	2.724	9.74
<i>CREDRIGHTS</i>	0.034	2.70	-0.004	-0.79	0.052	4.61	-0.007	-1.48	0.083	6.39	0.008	1.42
<i>GDP</i>	0.129	8.12	0.058	9.61	0.109	7.70	0.065	12.72	0.226	13.73	0.070	10.01
<i>GDPGROWTH</i>	-8.664	-14.71	-1.118	-4.85	-8.237	-16.45	-1.074	-5.29	-10.285	-13.29	-2.121	-5.93
<i>INFL</i>	0.228	0.47	-0.888	-5.13	-3.718	-15.70	-0.655	-6.97	-3.011	-7.38	-1.331	-7.49
<i>MKTCAP</i>	0.179	3.20	-0.047	-2.52	0.191	2.91	-0.002	-0.09	0.444	6.44	0.008	0.32
<i>TURNOVER</i>	0.656	11.39	-0.086	-4.47	0.778	15.37	-0.037	-2.08	0.722	12.58	-0.044	-1.81
<i>TRADE</i>	0.496	5.66	-0.308	-8.62	0.600	7.43	-0.248	-7.35	1.321	9.99	-0.205	-3.24
Year effects	Yes		Yes		Yes		Yes		Yes		Yes	
Adj. R <sup>2</sup>	0.11		0.14		0.13		0.12		0.13		0.10	
Obs.	55,902		55,902		60,050		60,050		48,637		48,637	

## Panel C: Alternative empirical specifications

### Panel C1: One observation per bank

The sample is based on one observation per bank, which is the bank-specific mean across all years. The dependent variable in the first specification is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *CORPTRAN* is the measure of corporate transparency. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.870	28.06	4.141	79.36
<i>CORPTRAN</i>	-0.170	-6.86	-0.063	-5.98
<i>GROWTH</i>	-0.255	-3.02	0.012	0.30
<i>LNASSETS</i>	-0.033	-4.12	-0.039	-13.27
<i>LIQUID</i>	-0.500	-11.74	-0.025	-1.28
<i>LLP</i>	-0.748	-13.44	0.175	7.22
<i>LISTED</i>	-0.189	-4.83	0.008	0.50
<i>MKTSHARE</i>	-0.417	-0.55	2.185	7.39
<i>CREDRIGHTS</i>	0.067	5.34	0.014	2.57
<i>GDP</i>	-0.030	-1.77	0.055	8.67
<i>GDPGROWTH</i>	-12.184	-9.76	-2.013	-4.02
<i>INFL</i>	-5.730	-17.12	-0.696	-4.79
<i>MKTCAP</i>	0.018	0.26	0.021	0.84
<i>TURNOVER</i>	1.025	13.53	0.003	0.11
<i>TRADE</i>	0.413	4.50	-0.292	-7.32
Year effects	Yes		Yes	
Adj. $R^2$	0.17		0.15	
Obs.	9,038		9,038	

## Panel C2: One observation per country

The sample is based on one observation per country, which is the country-specific mean across all observations for that country. The dependent variable in the first specification is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *CORPTRAN* is the measure of corporate transparency. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	5.260	5.03	3.780	10.88
<i>CORPTRAN</i>	-0.174	-2.44	-0.056	-1.87
<i>GROWTH</i>	-6.935	-7.30	-1.096	-4.59
<i>LNASSETS</i>	-0.201	-1.47	-0.016	-0.36
<i>LIQUID</i>	0.570	1.44	-0.069	-0.38
<i>LLP</i>	-1.069	-2.82	0.668	2.26
<i>LISTED</i>	-1.126	-2.26	-0.019	-0.13
<i>MKTSHARE</i>	5.046	0.70	5.537	1.73
<i>CREDRIGHTS</i>	0.038	0.91	0.017	0.97
<i>GDP</i>	0.005	0.07	0.085	2.45
<i>GDPGROWTH</i>	-7.208	-1.10	-7.656	-2.49
<i>INFL</i>	-5.384	-5.58	-0.076	-0.18
<i>MKTCAP</i>	0.333	1.06	-0.034	-0.35
<i>TURNOVER</i>	0.226	1.02	-0.051	-0.51
<i>TRADE</i>	-0.160	-0.51	-0.137	-1.04
Year effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.84		0.82	
Obs.	37		37	

### Panel C3: Alternative clustering of standard errors

The dependent variable in the first and third specifications is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second and fourth specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *CORPTRAN* is the measure of corporate transparency. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects. The standard errors in the first two specifications are clustered by country annually, while those in the next two specifications are clustered by country.

	Clustering by country-year				Clustering by country			
	<i>ZSCORE</i>		<i>EFFIC</i>		<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.765	11.95	4.166	69.85	3.765	11.95	4.166	44.04
<i>CORPTRAN</i>	-0.190	-4.56	-0.071	-5.04	-0.190	-1.78	-0.071	-1.93
<i>GROWTH</i>	0.011	0.32	-0.100	-7.49	0.011	0.44	-0.100	-6.54
<i>LNASSETS</i>	-0.038	-3.98	-0.038	-14.03	-0.038	-1.45	-0.038	-4.91
<i>LIQUID</i>	-0.383	-9.46	-0.046	-3.53	-0.383	-3.85	-0.046	-1.33
<i>LLP</i>	-0.603	-9.49	0.076	5.02	-0.603	-4.60	0.076	1.69
<i>LISTED</i>	-0.115	-3.35	0.022	2.30	-0.115	-1.41	0.022	0.87
<i>MKTSHARE</i>	-0.612	-0.99	2.281	15.28	-0.612	-0.43	2.281	6.15
<i>CREDRIGHTS</i>	0.087	4.45	0.007	1.30	0.087	1.89	0.007	0.56
<i>GDP</i>	0.100	2.93	0.062	10.26	0.100	1.08	0.062	4.69
<i>GDPGROWTH</i>	-8.261	-4.36	-1.093	-2.48	-8.261	-2.96	-1.093	-1.33
<i>INFL</i>	-3.896	-7.07	-0.705	-5.31	-3.896	-3.06	-0.705	-2.93
<i>MKTCAP</i>	0.268	1.88	0.016	0.45	0.268	0.63	0.016	0.20
<i>TURNOVER</i>	0.726	5.35	-0.056	-1.96	0.726	2.32	-0.056	-1.02
<i>TRADE</i>	0.484	2.63	-0.289	-6.69	0.484	1.00	-0.289	-2.63
Year effects	Yes		Yes		Yes		Yes	
Adj. R <sup>2</sup>	0.14		0.12		0.14		0.12	
Obs.	60,050		60,050		60,050		60,050	



**Panel D: Falsification tests**

**Panel D1: Pseudo measure of corporate transparency (*PCORPTRAN*)**

The dependent variable in the first specification is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *PCORPTRAN* is a randomly generated measure of corporate transparency allocated to countries. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* is an indicator variable that denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	2.822	23.18	4.190	94.44
<i>PCORPTRAN</i>	-0.001	-0.05	0.000	0.01
<i>GROWTH</i>	0.010	0.57	-0.100	-10.49
<i>LNASSETS</i>	-0.046	-6.45	-0.041	-14.90
<i>LIQUID</i>	-0.383	-11.60	-0.046	-3.15
<i>LLP</i>	-0.588	-19.43	0.082	6.26
<i>LISTED</i>	-0.086	-2.27	0.033	2.56
<i>MKTSHARE</i>	-0.437	-0.70	2.347	10.73
<i>CREDRIGHTS</i>	0.058	5.12	-0.004	-0.89
<i>GDP</i>	0.115	8.10	0.068	13.18
<i>GDPGROWTH</i>	-8.473	-16.62	-1.173	-5.58
<i>INFL</i>	-3.363	-14.46	-0.505	-5.49
<i>MKTCAP</i>	-0.046	-0.92	-0.102	-6.19
<i>TURNOVER</i>	0.793	15.64	-0.031	-1.72
<i>TRADE</i>	0.661	8.34	-0.222	-6.64
Year effects	Yes		Yes	
Number of iterations	1,000		1,000	

## Panel D2: Pseudo IFRS shock: bank-level evidence

The dependent variable in the first specification is *ZSCORE* where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the ratio of overhead costs to revenues. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *PPOST* indicates the pseudo pre vs. post adoption periods, defined as the three years around the pseudo IFRS adoption date. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>				<i>EFFIC</i>			
	Model 1		Model 2		Model 3		Model 4	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-8.599	-5.76	-6.753	-4.29	3.789	6.37	4.225	6.55
<i>IFRS*PPOST</i>	0.047	1.43	0.086	2.47	0.032	2.45	0.014	1.03
<i>GROWTH</i>	0.043	2.32	0.044	2.34	-0.072	-6.41	-0.070	-6.24
<i>LNASSETS</i>	-0.022	-2.93	-0.023	-2.97	-0.040	-12.86	-0.040	-12.79
<i>LIQUID</i>	-0.004	-12.03	-0.004	-12.03	0.000	-2.72	0.000	-2.71
<i>LLP</i>	-0.003	-11.93	-0.003	-11.79	0.001	5.24	0.001	5.29
<i>LISTED</i>	0.072	2.07	0.071	2.06	0.037	2.64	0.037	2.65
<i>MKTSHARE</i>	0.412	0.63	0.435	0.66	2.068	7.28	2.057	7.24
<i>GDP</i>	2.179	9.35	1.916	7.93	0.056	0.61	0.023	0.24
<i>GDPGROWTH</i>	-0.824	-2.05	-0.594	-1.47	0.236	1.13	0.375	1.78
<i>INFL</i>	-0.448	-1.80	-0.324	-1.31	-0.937	-7.37	-0.828	-6.71
<i>MKTCAP</i>			0.418	4.43			-0.181	-3.92
<i>TURNOVER</i>			0.054	0.81			-0.032	-1.20
<i>TRADE</i>			-1.085	-3.55			-0.280	-2.03
Year effects	Yes		Yes		Yes		Yes	
Country effects	Yes		Yes		Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.26		0.26		0.17		0.17	
Obs.	37,221		37,221		37,221		37,221	

### Panel D3: Pseudo IFRS shock: country-level evidence

The dependent variable is *BNKDEV* which represents bank development and is computed as the log of ratio of bank credit to the private sector scaled by GDP. *IFRS* is an indicator variable that denotes IFRS adopters vs. non-adopters. *PPOST* indicates the pseudo pre vs. post adoption periods. These are defined as the three years around the pseudo IFRS adoption date, but excluding the year of pseudo adoption. *NONINT* indicates the ratio of non-interest income to total income. *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and country fixed effects and robust standard errors clustered by country.

	<i>BNKDEV</i>		<i>BNKDEV</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	-0.770	-1.17	-0.408	-0.55
<i>IFRS*PPOST</i>	0.040	1.34	0.036	1.12
<i>NONINT</i>	0.017	0.13	0.022	0.18
<i>GDP</i>	0.254	2.03	0.210	1.55
<i>GDPGROWTH</i>	-0.969	-3.57	-0.873	-3.27
<i>INFL</i>	0.051	0.51	0.108	0.86
<i>MKTCAP</i>			-0.037	-0.72
<i>TURNOVER</i>			-0.045	-1.08
<i>TRADE</i>			-0.231	-0.91
Year effects	Yes		Yes	
Country effects	Yes		Yes	
Adj. $R^2$	0.94		0.94	
Obs.	276		276	

### Panel E: Controlling for differences in interest costs

The dependent variable is *ZSCORE* which is the inverse measure of bank risk where lower values denote higher risk. *CORPTRAN* captures the overall measure of corporate transparency. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets of the bank. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *INTEXP* denotes interest costs and is defined as interest expense divided by total liabilities. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	4.072	30.66	4.293	90.28
<i>CORPTRAN</i>	-0.183	-8.50	-0.066	-7.06
<i>GROWTH</i>	0.050	2.71	-0.082	-8.48
<i>LNASSETS</i>	-0.037	-5.14	-0.038	-14.13
<i>LIQUID</i>	-0.391	-11.63	-0.054	-3.74
<i>LLP</i>	-0.626	-20.39	0.046	3.74
<i>LISTED</i>	-0.139	-3.64	0.008	0.63
<i>MKTSHARE</i>	-0.552	-0.90	2.340	11.89
<i>CREDRIGHTS</i>	0.076	6.35	0.001	0.19
<i>GDP</i>	0.092	6.47	0.060	11.72
<i>GDPGROWTH</i>	-8.789	-17.23	-1.337	-6.69
<i>INFL</i>	-2.496	-9.52	-0.043	-0.39
<i>INTEXP</i>	-0.034	-11.56	-0.015	-10.01
<i>MKTCAP</i>	0.236	3.79	-0.003	-0.11
<i>TURNOVER</i>	0.681	13.25	-0.082	-4.64
<i>TRADE</i>	0.490	6.03	-0.275	-8.10
Year effects	Yes		Yes	
Adj. <i>R</i> <sup>2</sup>	0.14		0.14	
Obs.	59,146		59,146	

## Panel F: Using non-overlapping windows

The sample is based on non-overlapping windows of five years. The dependent variable in the first specification is *ZSCORE* which is the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the ratio of overhead costs to revenues. *CORPTRAN* captures the overall measure of corporate transparency. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets of the bank. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	5.231	31.64	4.124	89.57
<i>CORPTRAN</i>	-0.175	-5.29	-0.064	-5.68
<i>GROWTH</i>	-0.490	-4.94	-0.022	-0.83
<i>LNASSETS</i>	-0.050	-5.44	-0.039	-14.28
<i>LIQUID</i>	-0.481	-9.86	-0.059	-3.37
<i>LLP</i>	-1.043	-18.50	0.123	6.43
<i>LISTED</i>	-0.180	-3.82	0.007	0.47
<i>MKTSHARE</i>	0.751	0.89	2.364	9.89
<i>CREDRIGHTS</i>	0.087	5.80	0.007	1.42
<i>GDP</i>	0.017	0.86	0.063	11.18
<i>GDPGROWTH</i>	-16.028	-11.59	-1.306	-3.69
<i>INFL</i>	-5.103	-11.92	-0.673	-5.47
<i>MKTCAP</i>	0.174	2.02	-0.010	-0.40
<i>TURNOVER</i>	1.012	12.83	-0.025	-1.14
<i>TRADE</i>	0.451	4.19	-0.274	-7.63
Window effects	Yes		Yes	
Adj. R <sup>2</sup>	0.13		0.13	
Obs.	13,813		16,291	

### Panel G: Including small banks

The sample excludes banks with total assets of less than US\$ 100 million and those classified as Islamic banks. The dependent variable in the first specification is *ZSCORE* which is the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the ratio of overhead costs to revenues. *CORPTRAN* captures the overall measure of corporate transparency. *GROWTH* represents annual growth in revenues. *LNASSETS* is the log of total assets of the bank. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.521	29.52	4.125	93.97
<i>CORPTRAN</i>	-0.189	-9.21	-0.077	-8.17
<i>GROWTH</i>	0.019	1.15	-0.077	-8.81
<i>LNASSETS</i>	-0.025	-4.27	-0.035	-14.01
<i>LIQUID</i>	-0.356	-13.69	-0.030	-2.51
<i>LLP</i>	-0.520	-19.00	0.083	7.00
<i>LISTED</i>	-0.124	-3.32	0.015	1.13
<i>MKTSHARE</i>	-0.822	-1.33	2.204	10.00
<i>CREDRIGHTS</i>	0.090	8.11	0.012	2.57
<i>GDP</i>	0.110	8.17	0.059	11.95
<i>GDPGROWTH</i>	-7.478	-15.51	-1.056	-5.42
<i>INFL</i>	-3.577	-17.35	-0.615	-7.58
<i>MKTCAP</i>	0.285	4.94	0.038	1.78
<i>TURNOVER</i>	0.763	15.73	-0.050	-2.74
<i>TRADE</i>	0.472	6.10	-0.292	-8.61
Year effects	Yes		Yes	
Adj. R <sup>2</sup>	0.13		0.11	
Obs.	67,558		67,558	

## Panel H: Including U.S. data

The sample in this panel also includes U.S. banks on Bankscope. The dependent variable in the first specification is *ZSCORE*, the inverse measure of bank risk where lower values denote higher risk. The dependent variable in the second specification is *EFFIC* which represents the log of the ratio of overhead costs to revenues. *CORPTRAN* is the measure of corporate transparency. *GROWTH* represents annual revenue growth. *LNASSETS* is the log of bank assets. *LIQUID* indicates the ratio of liquid assets to liquid liabilities. *LLP* stands for the ratio of loan loss provisions to total loans. *LISTED* denotes public banks. *MKTSHARE* denotes the market share of the country's deposits held by the bank. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year fixed effects and robust standard errors clustered by bank.

## Panel H1: Bank-level analysis

	<i>ZSCORE</i>		<i>EFFIC</i>	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	3.860	30.66	4.402	103.15
<i>CORPTRAN</i>	-0.173	-7.39	-0.079	-7.86
<i>GROWTH</i>	-0.040	-2.39	-0.112	-14.70
<i>LNASSETS</i>	-0.058	-11.56	-0.027	-15.24
<i>LIQUID</i>	-0.454	-14.54	-0.005	-0.37
<i>LLP</i>	-0.910	-29.06	0.046	3.85
<i>LISTED</i>	0.044	1.73	0.019	2.41
<i>MKTSHARE</i>	-0.113	-0.18	1.992	9.15
<i>CREDRIGHTS</i>	0.071	6.66	0.019	4.46
<i>GDP</i>	0.123	10.32	0.025	6.25
<i>GDPGROWTH</i>	-9.087	-18.36	-1.584	-8.71
<i>INFL</i>	-4.644	-15.09	-1.644	-14.55
<i>MKTCAP</i>	0.224	3.84	-0.089	-4.21
<i>TURNOVER</i>	0.753	18.82	-0.099	-7.45
<i>TRADE</i>	0.650	7.86	-0.283	-8.52
Year effects	Yes		Yes	
Adj. R <sup>2</sup>	0.16		0.10	
Obs.	96,240		96,240	

## Panel H2: Country-level analysis

The dependent variable in the first specification is *BNKDEV* which represents bank development and is computed as the log of ratio of bank credit to the private sector scaled by GDP. The dependent variable in the second (probit) specification is *BNKCRISIS* which is an indicator variable that denotes whether or not the country had a banking crisis during the late 1980s and 1990s. *CORPTRAN* captures the overall measure of corporate transparency. *NONINT* indicates the ratio of non-interest income to total income. *CREDRIGHTS* denotes country-level creditor rights as defined by LaPorta et al. (1998). *GDP* represents log GDP. *GDPGROWTH* and *INFL* represent the annual GDP growth and annual inflation respectively. *MKTCAP*, *TURNOVER* and *TRADE* denote the logs of the ratios of market cap of listed firms, annual turnover of listed firms and total of exports and imports respectively, each divided by GDP. All regressions include year and legal origin fixed effects and robust standard errors.

	<i>BNKDEV</i>				Pr ( <i>BNKCRISIS</i> =1)			
	Model 1		Model 2		Model 3		Model 4	
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>
Intercept	0.286	3.80	0.060	0.69	0.102	0.18	-0.006	-0.01
<i>CORPTRAN</i>	0.087	9.17	0.056	5.15	-0.305	-3.13	-0.329	-2.91
<i>NONINT</i>	-0.156	-1.97	-0.322	-4.64	-4.003	-7.02	-3.921	-6.63
<i>PVTMON</i>	0.014	1.85	0.007	0.92	0.024	0.40	0.033	0.52
<i>OFFPOW</i>	0.015	4.82	0.019	6.87	-0.008	-0.30	-0.013	-0.48
<i>CREDRIGHTS</i>	-0.005	-0.64	0.000	0.05	-0.445	-6.62	-0.440	-6.27
<i>GDP</i>	0.042	6.73	0.045	5.51	0.151	2.68	0.178	2.44
<i>GDPGROWTH</i>	-0.582	-1.66	-1.541	-4.50	9.188	3.17	9.824	3.15
<i>INFL</i>	-1.761	-10.18	-1.481	-8.42	7.219	4.79	7.186	4.60
<i>MKTCAP</i>			0.250	7.38			-0.023	-0.07
<i>TURNOVER</i>			0.090	2.70			-0.240	-0.76
<i>TRADE</i>			0.149	4.14			0.047	0.12
Year effects	Yes		Yes		Yes		Yes	
Origin effects	Yes		Yes		Yes		Yes	
Adj./Pseudo $R^2$	0.55		0.63		0.27		0.27	
Obs.	473		473		477		477	