The Long Term Effects of a Bank Bailout Program:

Evidence from an Emerging Market

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As a response to the global financial crisis of 2008, governments worldwide implemented bailout programs to restore stability and stimulate lending in their financial sectors, notwithstanding that little evidence exists about the long term effects of this type of government intervention. This paper presents an empirical assessment of the long term effects of bank recapitalization on bank risk and lending, two outcomes at the center of policy debate regarding the bailout. To understand the long term effects, a panel data set of the banking sector in Indonesia is used, as the Indonesian government implemented a recapitalization program in the banking sector following the Asian financial crisis of 1997. The results indicate that recapitalization leads to more risk-taking and increased lending by banks, and these effects are persistent in the long run. Although the increased risk-taking suggests evidence of moral hazard, the results indicate that the differences in risk-taking between recapitalized and non-recapitalized firms may be driven also by the decreased risk-taking of banks that did not experience intervention in addition to the increased risk-taking by banks that did. Further, recapitalization is found to stimulate lending in the long run, although the increased lending comes almost completely from banks participating in asset transfer. Altogether, the results suggest that the effectiveness of recapitalization in reviving lending may have costs in terms of increased risk in the future and that a bailout program that does not address underlying bad corporate loans may be equivalent from a lending standpoint to no bailout at all.

Key Words: Financial Crisis; Bailout; Emerging Markets; Government Intervention; Public-Private Interaction; Bank Lending Channel

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"What all this amounts to is an unintended and unanticipated extension of the official safety net…The obvious danger is that with the passage of time, risk-taking will be encouraged and efforts at prudential restraint will be resisted."

-Paul Volker, September 2009

1 Introduction

Over the past two years, much of the world narrowly sidestepped complete financial crisis as lending slowed significantly and capital markets experienced a downturn second only to the Great Depression. Perhaps the most contentious element of many governments' responses to this and previous financial crises is the bailout of the banking sector. In the U.S, the bailout was implemented through the Troubled Assets Recovery Program (TARP) that recapitalized banks. Political opinion regarding recapitalization is polarized and has been a major campaign issue in the 2010 mid-term elections; Opponents argue that providing a safety net for banks will lead to moral hazard, i.e. bank managers to respond strategically, taking on more risk because they believe that the government will bailout any losses. Proponents, on the other hand, believe that TARP adds liquidity to the economy by stimulating lending to borrowers who invest those funds, thereby facilitating recovery from the financial crisis. Despite the intensity of the political debate, little rigorous evidence exists to address the fundamental question of how bailouts affect risk-taking and lending in the long term.

The intent of TARP, and other programs like it worldwide, is to stabilize the banking sector and stimulate lending by recapitalizing banks through the provision of capital and the purchase of so-called toxic assets. The hypothesis is that providing banks with capital and purchasing toxic assets will strengthen bank balance sheets, and thereby allow bank managers to resume lending. The execution of the program, however, has generated widespread skepticism because there are little restrictions on the use of the additional capital or on bank behavior. Hence, bank managers may not only use the capital for purposes besides lending, but also respond strategically to being rescued from failure by increasing risk-taking in the long term. In addition, in the end, TARP did not purchase toxic assets leaving bad corporate loans on bank balance sheets.

Theory provides some guidance to these questions. Characterized by decreases in deposits, loan losses and the hesitancy of banks to lend under uncertain conditions, financial crises often result in a negative shock to credit supply. By subsidizing bank capital, recapitalization should in theory lead to increased lending to borrowers, relieving the bank lending channel from distress. In terms of the relationship between recapitalization and risk-taking, economic theory is less clear. Because of the simultaneous presence of external agency costs generated from the relationship between managers and the government, and the internal agency costs between equityholders and debtholders of the firm, recapitalization may serve either to increase risk-taking or decrease it. External agency costs arise as a result of the relationship between managers and the government. As discussed earlier, by providing a safety net for banks, recapitalization may induce behavior consistent with moral hazard, which would imply increased risk-taking at recapitalized banks. On the other hand, recapitalization may also address agency costs internal to the firm that arise due to the differing payoff structures of equity holders and debt holders. By recapitalizing, the classic asset substitution problem between equity holders and debt holders may be mitigated, leading to less risk-taking on the part of managers. The predicted effects from both the moral hazard and asset substitution viewpoint are likely to be simultaneously present following recapitalization. Ultimately, therefore, it is an empirical question as to whether on-balance, recapitalization is associated with more or less risk-taking by bank managers.

This paper addresses the fundamental question of whether bank recapitalization leads to increased lending and whether bank managers strategically respond to being rescued by taking on more risk in the future. We use data from a TARP-like program in Indonesia following the Asian financial crisis over the 1993-2008 period to analyze the long term effects of a bailout program on risk taking and lending. Similar to TARP, the Indonesian Bank Restructuring Agency (IBRA) recapitalized banks in order to stimulate lending and stabilize the distressed Indonesian banking sector. We estimate the impact of IBRA on lending and risk-taking using a differences-in-differences methodology supported by IBRA selection criteria used to determine which banks would be recapitalized, information rarely available in program analysis. The results indicate that recapitalization leads to a 40% net increase in risk-taking, approximately a 1.5 standard deviation increase from the pre-recapitalization control group mean. The change in

risk-taking, however, appears to be driven by the decreased risk-taking of non-recapitalized bank managers in addition to the increased risk-taking of recapitalized bank managers. Further, the results indicate that recapitalization increases lending flow by 3.6 million Indonesian rupiah (IDR), which is several standard deviations above the pre-crisis control group mean. Further intervention through the transfer of toxic assets provides an additional 3.3 million IDR in lending volume.

Collectively, the results inform both the current political debate concerning the bailout and also future government policy regarding banking sector crisis. On the one hand, to the extent that the increase in lending provided by recapitalization helps to buffer the real-side economy from an economic downturn, this paper provides evidence that recapitalization is a successful policy mechanism. On the other hand, the results also show that fears of recapitalization leading to increased risk-taking in the long run are indeed justified, suggesting that recapitalization may have unforeseen costs. Finally, with evidence that managers at non-recapitalized banks take significantly less risk in the long run, the results suggest that a bailout program may have unintended consequences on the entire sector, not just those firms provided aid.

This paper is one of few pieces that empirically analyzes the long term effects of a bailout program on lending and the risk-taking behavior of bank managers. While the current financial crisis has motivated a resurgence of work on the effects of financial crisis in general (Ivashina and Scharfstein 2008, Campello, Graham and Harvey 2010), few papers empirically analyze the effects of a bailout program, and those that do suffer from the issue of having few post-bailout time periods, limiting the analysis to short term effects (Veronesi and Zingales 2010). This paper, however, benefits from eleven post-crisis and eight post-intervention years, enabling comparison of before-and after outcomes and allowing for the analysis of long term effects.

More generally, research on the relationship between regulation and risk-taking typically looks at how changes to government banking policy such as the introduction of deposit insurance and capital requirements affect risk-taking has mixed results (Laeven and Levine 2008, John, Litov and Yeung 2008, Saunders, Strock and Travlos 1990). These papers, however, are often limited to cross-country analysis and do not look at the effect of providing capital to banks during distress per se. This paper contributes to this literature by utilizing panel data, which

provides for controlling for observed and unobserved firm specific time-invariant characteristics which may otherwise confound identification and also directly addressing how recapitalization as a government intervention changes outcomes. Finally, this paper contributes to the bank lending channel literature by examining the effects of a positive, rather than negative liquidity shocks for banks. Previous work examines whether banks pass on negative liquidity shocks to borrowers (Bernanke and Lown 1991, Dell' Ariccia, Detraiagche and Rajan 2008, and Peek and Rosengren 2000, Khwaja and Mian 2008), while it remains unexplored whether a positive shock such as recapitalization has the complementary effect.

The paper proceeds as follows. Section 2 discusses the related literature covering the relationship between the effect of bank bailouts on managerial behavior, the bank lending channel and the broader literature on the effect of bank regulation on risk taking. Section 3 discusses related economic theory for the generation of hypotheses. Section 4 describes the institutional background including a discussion of the Indonesian banking sector, the Asian financial crisis and the Indonesian government's institutional response to the financial crisis. Section 5 describes data and methods used to better understand how bank recapitalization is related to risk and lending outcomes. Section 6 discusses the results. Section 7 concludes and Section 8 discusses areas for further research.

2 Institutional Description

3.1 The Indonesian Banking Sector

The financial system in Indonesia has traditionally been dominated by banks (Enoch et al 2001). The period of the most significant growth in the banking sector, however, was the 1980s, when a series of reforms aimed at decreasing the dominance of state owned banks and promoting growth were implemented. These reforms, focused on deregulation, lead to a dramatic increase in the number of banks and a diffusion of market power. From 1988 to 1995, the number of banks more than doubled from 111 to 240, while the five largest banks controlled only 17% of total bank assets and a similar percentage of total market share (Sato 2004). Many of these new banks were private domestic banks, opened explicitly to provide credit for affiliated companies (Bongini et al 2009).

By the 1990s, however, problems in the banking sector began to emerge. Non-performing loans increased, and it became apparent that connected lending restrictions were violated. Several other banks were also struggling during the early 1990s. In late 1992, Indonesian authorities solicited a $300 million dollar loan from the World Bank to help bail out suffering state banks and several private banks that faced high non-performing loan ratios and very low capital adequacy ratios. In total, this bailout was estimated to have cost about two percent of GDP. Despite these problems, from 1994 to 1997 the Indonesian economy and financial sector witnessed very rapid growth. Bank credit grew three times faster than the steadily increasing GDP.

Although the banking industry witnessed rapid growth over this time period, problems began to emerge. In early 1992, the central bank, the Bank of Indonesia (BI), became aware that several banks faced high non-performing loan ratios and low capital adequacy ratios. In response to these problems, Indonesian authorities solicited a $300 million dollar loan from the World Bank to help bail out these banks. In total, this bailout was estimated to have cost about two percent of GDP. This was the first incident of government bailout in the banking sector, but would not be the last.

3.2 The Asian Financial Crisis in Indonesia

The steady growth of the Indonesian economy was interrupted in 1997 by the influence of the rapid devaluation of the Thai baht. In July 1997, currency speculators moved out of large positions in the Thai currency, which initiated doubt by investors in the economic viability of other Southeast Asian countries as well. Thus what started as a currency crisis in Thailand, spread all over the regions, including Indonesia. The currency crisis quickly became a banking crisis and political crisis ensued as well, leading to the termination of President Suharto's more than thirty year rule over Indonesia as well as three decades of trade surpluses, low inflation, large foreign exchange reserves and constant growth. A timeline of the crisis is provided in Table 1.

What started as a currency crisis quickly spread to the banking sector in Indonesia because several existing lending practices created systemic problems under conditions of currency

volatility. First, it was commonplace for Indonesian companies in the non-financial corporate sector to hold foreign denominated debt. The devaluation, therefore, left many companies unable to service their debt. Further, banks and their borrowers had established the convention of contracting with short term obligations and instead continually extending loan terms rather than contracting in long term obligations. By maintaining short term obligations, firms could take advantage of typically lower interest rates. Banks, on the other hand, were obliged to maintain this standard practice to attract and retain customers. When the crisis began, banks were no longer willing to extend these loans, further increasing the amount of non-performing loans in the system.

As these problems emerged, they contributed to a widespread loss of confidence in the banking sector. As a result, depositors began withdrawing funds, causing banks runs. With decreased deposits available to fund lending, bank managers then became even more hesitant to lend. This cycle resulted in the virtual elimination of available credit, making firms less likely to service their debt and threatening the function of the non-financial sector (Sato 2004).

By October 1997, the banking crisis became so severe that the Indonesian government solicited the help of the IMF. This began a series of agreements between the IMF and the Indonesian government that would last several years. In exchange for financial and operational support to address the crisis, the Indonesian government agreed to many IMF-lead reforms. One of the first actions to directly address the banking crisis was the closure of 16 small insolvent banks with no public notice on November 1, 1997. The surprise nature of the closures consequently triggered a bank run So rather than improving confidence in the banking sector, this government intervention had the opposite effect (Chou 1999). By mid-December 1997, 154 banks had experienced a run on deposits as a result. By 2004, over 60 banks would be closed as a result of the financial crisis (see Table 2).

The financial crisis also instigated political instability. Although the 30 year reign of President Suharto was characterized by steady growth, firms with political connections also enjoyed economic advantages (Sato 2004). During the crisis, attention began to shift towards the detrimental effect these relationships may have had on the economy. As a result, public sentiment towards the President grew hostile, and by June 1998 Suharto stepped down.

3.3 Government Intervention and the Establishment of IBRA

To facilitate the restoration of stability in the banking sector, government intervention in the earlier stages of the crisis was aimed at providing immediate assistance to liquidity-strapped banks in order to prevent the complete failure of the banking system and the spread of the crisis to the non-financial sector. In the early stages, the government began to provide liquidity support, recapitalizing banks. BI used several criteria to assess the viability of these banks including: the size of the bank (number of employees, number of deposits, and several other measures), quality of governance, and several measures of financial stability (capital adequacy, non-performing loans, solvency).

In January 1998, the Indonesian government created a centralized institution to carry out the bank bailout, the Indonesian Bank Restructuring Agency (IBRA). The government delegated three main duties to IBRA: implement recapitalization, recover bank assets, and recover state funds disbursed to the banking sector by selling the transferred assets of recapitalized banks. IBRA would implement the recapitalization by providing banks government bonds, in exchange for common shares.

The first step in the intervention process by IBRA was the establishment of guidelines with which to determine the set of banks to be recapitalized. Based largely on the qualifications used by BI to provide liquidity support at the beginning of the crisis, IBRA measured the banks on several dimensions. In order to maintain an independent evaluation process, IBRA employed an international consulting firm to analyze banks based on the predetermined criteria. The intent was that banks would survive based on the strict application of transparent criteria, not by non-market based rules.[1] As a result of the evaluations based on these criteria, IBRA would then make the final decision as to how to proceed: whether to let the bank stand alone, to recapitalize the bank or to shut it down. The aim was to close banks that were not viable even with IBRA assistance, and among remaining banks determine which banks should be recapitalized.

Three main characteristics were used to determine which banks would be recapitalized: the role in the economy of the bank, the financial viability and the quality of governance, called the

[1] With the exception of government owned banks, all of which would be recapitalized.

"fit and proper" test. The bank's role in the economy was assessed using the following measures: the number of employees, number of branches, number of deposits and the geographic reach of the bank. In general, the intent was to support banks that were influential in the economy. Due to the geographic dispersion of the Indonesian archipelago, IBRA wanted to save banks in regions of the country with fewer banks to ensure access to banking services for Indonesians in remote areas. Financial viability, on the other hand, was measured using several financial variables including the capital adequacy ratio, non-performing loan levels, and the ability of shareholders to provide 20% of the recapitalization amount from private sources. Called the Settler Agreement Plan, the provision of private assets by shareholders was intended to prevent moral hazard as well as help fund the program.

In addition, banks were also evaluated based on the quality of their governance. IBRA used two criteria to determine whether a bank was fit and proper. The impetus for including this as a characteristic to determine recapitalization was an increased focus by the new government on good governance. The post-Suharto government realized that inadequate bank governance may have led to inefficiency and failure in the application of good management principles and caused fundamental weaknesses at the micro level in the financial markets (Goeltom 2008). Lending did not escape political influence, similar to the case in other countries, where lending has been shown to have a political element (Khwaja and Mian 2008). Even in state banks, for instance, lending decisions were thought to have been subjectively influenced by government intervention, with the result that many loans were extended by reason of political connections and not based on objective assessment of the investment). Further, it was widely believed that people connected to Suharto contributed disproportionately to loaning large amounts of capital in related lending transactions[2] (Sato 2004). Thus, the fit and proper test was part of the new focus aimed at improving the quality of governance in the banking sector from the Suharto era.

The quality of governance was measured in two ways. The first was an assessment of the quality of the governance of board members, management, and shareholders. First, IBRA

[2] Related lending encompasses lending to a "related party"; any natural person or company/entity exercising control over the bank, whether directly or indirectly, through ownership, management, and/or financial links. These types of transactions were not illegal, however, were limited by law.

checked whether these names were listed on two lists as participants in loan transactions. Compiled by BI, the "Daftar Kredit Macet" list or "Daftar Other Receivables" lists, were both lists of "bad loans", deemed uncollectible and requiring full provisioning. At the time, this determination was made by the BI using international standards developed in the Basel II accounting standards and could apply to personal or business-related loans. For most banks, having a shareholder, or manager on either list resulted in being considered not fit and proper.

The purpose of compiling these lists was two-fold. First (and less related to the fit and proper measure), forcing banks to acknowledge losses increased transparency, and forced banks to increase funds available for loan loss provision. Further, membership on these lists was considered perfectly correlated with inadequate bank management. Anecdotally, however, most of the names on the DKM/DOR lists were people connected to the former President Suharto, as was determined that a disproportionate amount of bad loans were both given to and issued by those connected to him. Thus, checking if managers, shareholders, or board members were on the DKM/DOR lists, effectively checked whether these persons were connected to Suharto, and evaluated them as less "fit and proper" if they were. Other more tacit measures of governance were also included in this measure. The independence of shareholders, managers and board members was also included although precise methods of measuring this were not specified.

The second main component of whether a bank satisfied the governance requirements of IBRA was whether the bank had a history of violating certain BI regulations. This determination was based mostly on whether the bank adhered to LLL and net open position (NOP) requirements. The LLL at the time of the crisis was 20% to unrelated parties and 10% to related parties.

The recapitalization of the banks was implemented over the years 1999 and 2000, although due to the continued loan resolution process, IBRA remained open until 2004. Over the course of both the initial BI intervention and subsequent participation of IBRA, 63 banks were recapitalized and IBRA acquired approximately 33 billion USD in assets, approximately 70% of GDP. Of the 63 banks recapitalized, 14 also transferred assets to IBRA for resolution. Ultimately, 76 banks closed over this period, accounting for 16% of total 1996 commercial bank

assets. (Sato 2005). Summary statistics of the recapitalized versus non-recapitalized banks are located in Table 3.

4 Theory

4.1 Government Intervention and Risk-Taking

The effect of IBRA on the risk behavior of bank managers operates through the agency costs generated by the manager's relationship with stakeholders. The theory that motivates these relationships is drawn from standard agency theory. Depending on whether internal versus external agency costs are relatively more influential, managers may be more or less inclined towards risk-taking following recapitalization. An intervention such as recapitalization may address agency costs arising from the relationship between equityholders and bondholders leading to decreased risk-taking, while on the other hand, intervention may exacerbate moral hazard issues that arise between the government and managers when a public safety net is provided.

The coexistence of these agency costs results from the fact that a government intervention into the banking sector involves several stakeholders. The stakeholders considered here are: the government/depositors, shareholder/managers, and debtholders. An equity injection into a bank may affect risk-taking by either reducing or exacerbating the agency costs between the separate parties.

The internal agency costs between equityholders and debtholders in a firm are a result of the differences in the payoff structures faced by these two stakeholders, which may create an incentive for equityholders to invest suboptimally. When a firm is insolvent, payout to equityholders is limited to zero due to limited liability, while when the firm is solvent, equityholders receive all cash flow left over after debt obligations are satisfied.[3] On the other hand, debtholders enjoy greater certainty of payouts, regardless of whether the firm is solvent or not. Further, when the firm is insolvent, debtholders receive payouts before equityholders.

[3] Insolvency is defined here as the inability of a firm to service its debt obligation from current assets.

As a result of these payoff structures, equityholders may benefit from investing in riskier projects which increase firm value in a boom and decrease firm value in a recession. Due to the residual claim of equityholders vis-a-vis debtholders, equityholders capture increases in firm value during a boom, without limit. In a recession, however, equityholders liability is limited. This asymmetric payoff structure results in bondholders effectively subsidizing equityholders if the risky project is chosen. Managers, therefore, may have incentive to chose the risky project, even if it is ultimately value-decreasing. Equityholders may bear this cost to debtholders when the debt is issued, however, if debtholders correctly anticipate this incentive. Thus, the cost of the incentive to invest in value-decreasing projects may ultimately be borne by equityholders who issue the debt. This effect, generally called the asset substitution effect, is the internal agency cost of debt financing.

A capital infusion from recapitalization may help to mitigate this cost. By increasing the value of equity in the firm, the subsidy from bondholders to equityholders for the risky project is reduced, as equityholders now have more at stake to lose during a recession. This decreases the incentive of equityholders to choose the risky project. Thus, recapitalization may lead to less risk-taking on the part of managers (if managers are acting in the best interest of equityholders).

The relationship between the three main stakeholders in the government intervention also may generate external agency costs. In this case, because the social implications are such that the government cannot afford not to recapitalize banks, the government will serve as a lender of last resort to troubled banks.[4] With confirmed expectations that they will be provided a public safety net, managers of supported banks may engage in activities consistent with moral hazard type behavior, as several papers show Cordella and Yeyati 2003, Freixas and Rochet (1997), Boot and Greenbaum (1993), Dewatripont and Tirole (1993), and Matutes and Vives (1995).[5] Increasing the public safety net weakens incentives for managers to avoid behavior that may increase private benefit at the cost of the firm. After being bailed out, managers may be more inclined to invest in an inefficient gambling asset that can yield high private returns for the manager if the gamble pays off but imposes costs on the government by endangering depositors if the gamble

[4] The lender of last resort refers to the discretionary provision of liquidity to a financial institution.

fails rather than a prudent asset yielding high expected returns (Cordella and Yeyati 2003). Further, being bailed out may decrease the incentives of depositors and peer banks to monitor managers, enabling managers to freely pursue value-decreasing projects that enhance their private benefit with no consequence. Bailing out a bank may also weaken incentives for managers to aggressively pursue bad borrowers, and recognizing this, borrowers would have less incentive to service their debt.

Thus, recapitalization may help alleviate internal agency costs but risk increasing external agency costs. The issue is whether the private benefits associated with moral hazard will be large enough to offset whatever incentives equityholders may provide for the manager to act in the equityholders' best interest. Both elements of internal and external agency costs are likely to be simultaneously present. Ultimately, it is therefore an empirical question whether on-balance recapitalization results in more or less risk-taking on the part of managers.

4.2 Government Intervention and Lending

Another important policy question is whether a government intervention such as recapitalization will successfully stimulate lending in supported banks (from a supply side point standpoint). Lending to borrowers may be constrained during a financial crisis for many reasons. Bank panics often occur during periods of systemic financial distress, causing depositors to remove their accounts from the banking system causing a bank run. Given that banks use deposits to fund new lending, a bank panic will reduce funds available for lending. In addition, the inability of borrowers to service their debt during a period of financial distress may further decrease the supply of funds available for lending. Thus one of the typical consequences of financial crisis is the severe decline of bank lending to borrowers, which may prevent even positive NPV projects from receiving funding. A recapitalization may address the lending problem and help avoid economic contraction by loosening bank lending constraints relative to prior to recapitalization. As long as banks do not use the liquidity infusion for other purposes,[6] and managers are willing to lend, a recapitalization should serve to increase lending to borrowers.

6 For instance, to pay out dividends, or for investment.

4.3 *Purchase of Toxic Assets*

A subset of the banks that received recapitalization funding also were forced to transfer certain assets (mostly non-performing loans) to IBRA for restructuring and disposal. By directly addressing the problem of bad corporate loans, IBRA intended to help these banks strengthen their balance sheets. If bad corporate loans were preventing banks from increasing available credit to borrowers, then by transferring these loans to IBRA, these firms should be able to lend more. It is therefore expected that those firms that underwent asset transfer would have a greater amount of lending volume than the firms that were only recapitalized.

5 Data and Methods

5.1 Data

Several datasets, some previously not available for analysis, others never before digitized, and others publicly available, are used to analyze the effect of IBRA on risk-taking and lending. The data is used to implement a differences-in-differences approach validated by analysis of the selection criteria showing that selection was based on time-invariant characteristics of the firm. The primary data set consists of the complete financial statements of each commercial bank in the banking sector collected annually by the Bank of Indonesia (henceforth the "BI dataset"). The BI dataset includes balance sheet, income statement and off-balance sheet information for the population of banks operating in the Indonesian banking sector from the years 1993-2000, which previously had not been digitized or translated from Indonesian into English and data from 2001-2008, which is made publicly available by BI. The BI dataset provides the information used for the risk-taking and lending variables. Further, from this dataset we observe if banks were recapitalized, by the presence of government bonds on the asset side of balance sheet during the period of IBRA existence.[7] In addition, the BI dataset includes descriptive information about each bank, including information on the geographic location of the bank, the number of employees, as well as ownership and governance information. The ownership information includes the type of ownership (government, private domestic, etc), the names of each

7 Prior to this time period, there is no evidence of government bonds on the asset side of bank balance sheets.

shareholder and the percentage held by each shareholder. Similarly, the governance information includes the names of each board and oversight committee member.[8]

This data set was combined with the results of the bank evaluation conducted by the independent consulting firm hired by IBRA to evaluate the banks. These initial reports included the results of the first 54 banks put under the auspices of IBRA in 1998. The evaluation reports, compiled by the third party international consultancy, contain information on the three criteria discussed in Section 3.3 used to determine if a bank would be recapitalized.

In terms of consistency of the data between the BI database and the IBRA database, information that is included in both datasets is not statistically different. Since IBRA began evaluation in early 1998, the information in the IBRA database is compared to the BI database for year 1997. Several values overlap including: total assets, total deposits, number of employees, capital adequacy ratio, and others. This provides confidence that combining the two datasets is acceptable and that substituting information from the BI database for banks not included in the IBRA database is adequate. In terms of quality of the data, the similarity in the two datasets also implies that even if the quality of the BI database was not satisfactory, statistically similar data was used at the time to select banks for recapitalization, which is arguably more important for supporting the validity empirical methodology used.

For the banks not included in this sample, who were audited at another point during the crisis, the information based on this criteria is culled from several sources. Measures of size and financial viability can be found in the information provided in the BI dataset. In order to reconstruct the governance measure, another data set is appended. This proprietary data set, obtained from a prominent Indonesian political consultancy firm, contains information on 500 political actors in Indonesia (henceforth referred to as the "political actors dataset")[9]. The political actors dataset includes information on ministers, cabinet members, key director generals, party leaders, parliamentary faction heads, parliamentary commission chairs and other influential players. For each actor, the political actors dataset contains information regarding their family, education, government positions held, other party positions held, and private sector

8 Every Indonesia limited liability company is required to have a two-tiered board, consisting of a Board of Directors and a Board of Commissioners, the latter of which oversees the former. Publicly listed companies also have an Audit Committee which assists the Board of Commissioners.

9 These politicians were determined by the political consultancy firm to be "the most influential."

affiliations. More tacit information is also available including details about friendships, involvement in scandals, membership to country clubs, etc. To reconstruct the fit and proper variable, the names of the most influential actors prior to the crisis are matched to the names of board members and shareholders of the banks in the BI database. In addition, the tacit information from the political actors database is also analyzed for connections to the Suharto regime. Over 30% of the banks listed have at least one board member or shareholder that was also an influential political actor under Suharto using this method.

The data above is used to estimate the impact of the bank recapitalization program on risk-taking and lending. The starting point is the set of all commercial banks that existed in 1994 and survived over the crisis period until 2008. This provides a sample of 149 banks over the 15 year period 1994-2008, a total of approximately 2,200 firm-year observations.

5.2 Identification and Estimation

To identify the effect of the bank recapitalization program on risk-taking and lending, recapitalization is considered as an exogenous change to a bank's ability to lend, controlling for the selection criteria used to determine which banks received support. The validity of this identification strategy rests on the assumption that recapitalization is independent of the potential risk-taking and lending outcomes, after conditioning on the observable covariates and that the control group is a good predictor for the treatment group had it not been treated.[10] Here the selection on observables assumption is arguably acceptable because the internal policy evaluation results are known and found to be time invariant, therefore controlled for in. Even if selection on observables is questionable, the empirical methodology will at least control for time invariant firm specific selection and time varying similarities shared by all firms. In this case, all of the non-random factors that affected selection for recapitalization can be observed.

Crucial to any comparison of pre- and post-intervention outcomes for recapitalized firms is selecting an appropriate benchmark in the absence of recapitalization. Ideally one would compare the behavior of a firm that experiences recapitalization to the firm's identical non-recapitalized twin at precisely the same moment in time. While this exact counterfactual is not

10 Generally referred to as the "common trends assumption".

observable, the availability of the recapitalization criteria allows for an atypical analysis of how firms were selected for recapitalization and helps test the validity of the control group.

Due to the fact that the covariates used for selection into recapitalization are known and can be controlled for, the control group used here is non-recapitalized surviving firms. Assuming that the selection criteria provided was actually implemented, by controlling for the selection criteria, recapitalization is as good as randomly assigned. Because the concern is that banks selected for government intervention differ in some meaningful way from banks that are not selected, and that this difference is not observable, the validity of this control group is tested in several ways.

First, a probit analysis is conducted testing the likelihood of being recapitalized on the covariates provided by IBRA. Table 4 column 1 provides the results of this regression. The results indicate that several of the selection criteria are significant in determining whether a firm receives recapitalization. Geographical dispersion, governance, and the ownership parameter estimates are all significant. Possible omitted variables are included in Table 4, column 2. These covariates could also potentially explain selection into recapitalization. Several are additional proxies for size (age, cash), others include a measure of the concentration of ownership (average shares held by each shareholders), and finally, a measure of the proportion of loans to related parties, which is commonly used as an additional proxy for governance. The failure of a firm that is widely held may have a broader social impact, implying that the government may be more inclined to save it from distress. The addition of the potential omitted variables make only minor changes to the results and their parameter estimates are insignificant, suggesting that they were not used in determining recapitalization.

The results in Table 4 indicate that the selection criteria provided are highly predictive. In fact, post-estimation diagnostics indicate that the model in Table 4, column 1 classifies 96% of the firms correctly as either recapitalized or non-recapitalized. Further, since the highly predictive selection process is based on time-invariant characteristics, including time-invariant fixed effects in regression analysis will effectively control for these criteria, validating the use of the non-recapitalized firms as the control group.

The validity of the control group can also be examined by analyzing the pre-crisis outcome variables for the recapitalized and non-recapitalized banks. If these outcome variables are systematically different between the recapitalized and non-recapitalized firms, then any measured effect in the outcome variables cannot be attributed to recapitalization per se, but may in fact result from pre-existing differences between the two groups. To address concerns about the appropriateness of this control group, several analyses are conducted. Figures 1 and 2 plot the time series for the outcome variables between the recapitalized and non-recapitalized group. From these graphs, prior to recapitalization, the recapitalized and non-recapitalized firms seem similar for both the risk-taking and lending outcome, after recapitalization, however, the two groups diverge. Statistical analysis of differences in pre-crisis outcome values further support the similarity in outcome variables pre-recapitalization. The pre-existing differences are discussed in more detail in Section 5.3 below.

After addressing the concerns of control group validity, a differences-in-differences methodology is used that compares changes in outcomes of the recapitalized banks with those that were not recapitalized for surviving banks. This approach controls for both observed and unobserved time-varying firm specific heterogeneity and firm-varying time specific heterogeneity by using firm-fixed effects and time-fixed effects and is equivalent to conditioning on the time-invariant selection criteria.

The following equation specifies the model used for estimating the effect of recapitalization on the outcome variables:

$$Outcome_{it}=\beta(Recapitalization*Post)_{it}+\delta_i+\alpha_t+\varepsilon_{it} \quad (1)$$

where Recapitalization is an indicator equal to one for those firms that were recapitalized, Post is a variable equal to one for post-recapitalization years, δ_i is a firm fixed effect and α_t is a time fixed effect.

The dependent variable used to measure risk is the z-score, which measures the distance a firm is from insolvency (Roy 1952). (See the Appendix for the derivation.) The z-score equals the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. A higher z-score indicates that the bank is more stable. Because the z-score is highly skewed, the

natural logarithm of each z-score measure is used, which is normally distributed. The other outcome variable used is lending volume. Here, lending volume is measured as the change in disbursed credit in IDR from the previous year.

In addition to the relationship between recapitalization and the risk-taking and lending outcomes, the relationship between the degree of government intervention and lending volume is also tested. As discussed in Section 3.2, intervention that includes asset disposition may lead to a relatively higher increase in lending volume than banks which experienced recapitalization without asset disposition. The specification used to test this hypothesis is:

$$\text{Lending Volume}_{it}=\beta(\text{Asset Purchase} * \text{Recapitalization} * \text{Post})_{it}+\delta_i+\alpha_t+\varepsilon_{it} \quad (2)$$

where Asset Purchase is an indicator for those banks that also transferred assets to IBRA in addition to receiving recapitalization funding.

5.3 Summary Statistics

In the initial phase of recapitalization, IBRA recapitalized 42 banks. By IBRA's closing in 2004, 63 banks had received liquidity support: 5 state banks, 35 private domestic banks, 16 private non-foreign exchange, 12 regional development banks, 5 joint venture banks and 6 foreign owned banks. Prior to recapitalization, banks that would later be bailed out were on average larger, and less profitable (See Table 3).

The average value for the outcome variables for recapitalized and non-recapitalized banks both before and after the bailout are indicated in Tables 5 and 6. The first row of Table 5 shows the average for the risk measure for each group both before and after intervention. As indicated in the third row of Table 5, the difference between pre-recapitalization for the risk measure for recapitalized and non-recapitalized banks (1.89-1.99=.1) is not statistically significant. Because the pre-existing differences between the two groups are not statistically significant, statistically significant post-intervention differences cannot be attributed to pre-existing differences, which provides further evidence for the appropriateness of the differences-in-differences methodology. Tables 5 and 6 also show that the between groups differences are statistically different after the recapitalization for both outcome measures.

6 Results

6.1 The Impact of Bailout on Risk-taking and Lending Volume

Table 7 shows results of the impact of recapitalization on risk-taking and lending. Column 1 of Table 7 presents the results of equation (1) for the primary risk measure. This result indicates that recapitalization is associated with a decrease in zscore (increase in risk-taking) by approximately 40%. The net change in average risk-taking is approximately a 1.5 standard deviation increase from the pre-recapitalization control group average risk-taking measure.

To understand the magnitude of this change better, a placebo differences-in-differences analysis was calculated using only the pre-recapitalization data. The restricted sample of data prior to 1997 was divided into two time periods, and the same analysis from equation (1) was repeated. That is, the years 1993, 1994 were considered "pre-recapitalization" years and 1995, 1996 were considered "post-recapitalization" years. The results of the analysis are located in Table 8. This exercise provides two important pieces of information. First, the parameter estimate of recapitalized variable is not significant, providing further evidence that the differing patterns between the recapitalized and non-recapitalized banks in the full sample are not simply the result of a pre-existing trend. Although the parameter of interest is not significant, there is a net decrease in the risk measure between the two groups over the placebo time period. This net change, however, is only a .02 standard deviation decrease from the pre-recapitalization control group average, compared to the 1.5 standard deviation increase from the pre-recapitalization control group in the full sample.

These results provide evidence for behavior that is consistent with the moral hazard view, which suggests that bank managers increase risk-taking due to ex-ante and ex-post reliance on government support. In line with the theory discussed earlier, this suggests that the impact of recapitalization on risk-taking is greater through the external agency cost channel between the manager and the government than the internal agency costs between shareholders and debtholders.

Although the parameter estimates support the moral hazard view, Table 7 and Figure 1, suggest a more nuanced explanation for the results. The parameter estimate of the regression

results represent the difference-in-differences between the recapitalized and non-recapitalized firms. Figure 1, shows that post-recapitalization, the control group seems to have a more dramatic change in than the recapitalized set of firms. More specifically, there seems to be a large increase in the zscore for non-recapitalized firms, which means a decrease in the risk. Table 5 supports this observation. Here, the within-group difference for the non-recapitalized firms is significant, while the within-group difference for the recapitalized group is significant only with one measure. This implies that the differences-in-differences parameter estimate, which is significant, may be largely driven by the changes over time within the non-recapitalized firm. This provides evidence that recapitalization may have more of an impact on those firms not receiving support rather than the firms that did.

The influence of the change in behavior of non-recapitalized banks provides interesting policy implications. Government intervention here may lead to a change in behavior, but not in the sense anticipated. Similar to a moral hazard argument that assumes managers change their behavior because they believe they will be bailed out, managers perhaps change their behavior as when they know they will not be bailed out in the future. The behavior seen here is consistent with a view that firms left to standalone substitute the absence of a government safety net with their own internal safety net by taking less risk.

Table 7 column 4 presents results of the model looking at the relationship between recapitalization and lending. The parameter estimates for recapitalization are significant and positive, indicating that the recapitalization has been successful at stimulating credit availability. Recapitalization increases lending flow by 3.6 (millions IDR), which is several standard deviations above pre-crisis control group average lending flow. The results of the placebo analysis using lending volume instead of risk-taking show that lending flow actually decreased over the placebo crisis (see Table 8). This implies that, similar to the risk-taking value, the lending flow patterns between recapitalized and non-recapitalized banks for the entire time period cannot be the result of a long-term trend.[11]

[11] The fact that the lending volume actually decreases prevents the comparison of magnitudes discussed for the risk-taking variable.

Figure 3 presents the average lending flow over the period 1993-2008, separating banks instead into three groups; non-recapitalized, recapitalized and recapitalized with asset transfer. Table 9 presents the results from specification (2), measuring the differential effect of the asset purchase on lending volume flow. The parameter estimate on the variable Asset Purchase represents the additional lending volume of those banks that transferred assets to IBRA. Beyond just being recapitalized, transferring assets provides an additional 3.3 (millions IDR) in lending volume. This provides evidence for idea that dealing directly with bad corporate loans will help even further towards improving bank balance sheets and releasing credit. Further, it appears from Figure 3 that the lending volume of recapitalized banks is more similar to those banks that were not recapitalized than to those that received the greater amount of intervention, suggesting that the increase in lending volume by recapitalized firms is largely driven by those firms that also transferred assets to IBRA. This suggests that a bailout policy that only addresses short term liquidity issues, an not underlying bad corporate loans, may not be successful at stimulating lending.

7 Robustness

7.1 *Alternative Explanations*

The empirical approach used and the addition of the availability of the selection criteria employed to choose which banks to recapitalize helps to resolve typical issues regarding the effect of policy implementation on the firm level. Here, several other remaining concerns are addressed.

Bank Size

One concern may be that the results are confounded by bank size. If larger banks respond differently to the recapitalization than smaller firms, and being recapitalized is a function of size, then the effect of recapitalization may be measuring the effect of size on the outcome variables instead. Table 10 show the regression results from equation (1) , controlling for the differential effect of bank size on the risk-taking and lending volume, respectively. Each of the parameter estimates regarding risk-taking are robust to including the size control. Bank size, therefore, does not change the risk-taking result. Not surprisingly, the parameter estimate of the relationship of

recapitalization to lending volume remains significant when including the size control, but the magnitude decreases. This implies that recapitalization will increase lending volume, but more so for larger banks, which may have a greater capacity to lend because of their size (loan officers, monitoring capabilities, etc).

Political Connections

The Asian financial crisis was also a period of political change in Indonesia (see Table 1), precipitated by the fall of President Suharto in January 1998. Prior to the crisis, a firm's political connection to Suharto had the potential to provide abnormal economic returns (Fisman 2001). His removal from power, therefore, may have dramatically altered the business environment for these firms. If the change in the political connection caused changes in manager's behavior, then the effect being measured here may in fact be the result of political connections rather than recapitalization. If the fall of Suharto changed manager behavior and this is what is driving differences in the outcome variables between the two groups, these changes should be reflected in the 1998 data, when Suharto was removed from power. It is evident from the time series, however, that the changes in outcome variables between the two groups happen later, during the recapitalization period (1999-2000).

Borrower Demand

Another potential concern may be that the observed changes in lending volume over time (as seen in Figure 3) are predominately driven by demand- side changes rather than by the loosening of lending constraints caused by recapitalization. This would again imply that the regression results in Table 7 are confounded by an omitted variable. In terms of borrower demand over time, it is evident that total lending volume in the banking sector is increasing post-recapitalization. A demand side argument, however, would also have to explain the systematic differences between the two sets of banks. Demand side changes would be driving the systematic differences between the non-recapitalized and recapitalized firms, only if: a) borrowers are systematically switching from non-recapitalized to recapitalized banks, b) recapitalized banks

have systematically larger borrowers, after the recapitalization program or c) new borrowers systematically borrow from recapitalized rather than non-recapitalized banks.[12]

In order to eliminate the hypothesis that the lending volume result is driven by borrower switching, the parameter estimates of a multinomial logit regression analyzing the likelihood of a borrower switching from a non-recapitalized bank to a recapitalized bank after the recapitalization program is analyzed. A panel dataset of approximately one-third of the firms in the manufacturing sector in Indonesia in 1994, 200, 2005, and 2009, is used to conduct this analysis. Information in this dataset includes: creditor names, total investment amounts separated by equity and loans, firm address, number of employees, legal status and ownership structure, and industry. Connecting this additional dataset to the original dataset allows for the observation of whether firms are systematically switching from non-recapitalized to recapitalized banks within this sample. This additional dataset also allows for comparison of the size of borrowers between recapitalized and non-recapitalized banks, and observation of whether new entrants systematically select into recapitalized banks.[13]

7.2 Alternative Measures of Risk

While the z-score measure is the primary measure of risk, the results are robust to using alternative bank risk measures. The primary z-score measure is calculated using the standard deviation within firm over time. The z-score calculated using between-firm variation produces the same regression results, as shown in Table 7, Column 2. In addition, the results remain robust to using the capital adequacy ratio (CAR) as the measure of risk. Similar to the z-score, CAR measures the capacity of the bank in terms of meeting the time liabilities and other risks such as credit risk, operational risk, etc. In the most simple formulation, a bank's capital is the cushion for potential losses, which protects the bank's depositors or other lenders. Banking regulators in most countries define and monitor CAR to protect depositors. The details of the CAR calculation

[12] These explanations for the salience of demand side features assume that the market for loans is not perfect. If it were, borrowers would be indifferent to bank type, as the price of the same loan between banks should take into borrower preferences.

[13] This is currently in process.

are located in Table 11. As shown in Table 7, Column 3, the main regression results remain robust to this alternative measure as well.

7.3 Outliers

All of the results are robust to truncating the data at the 1st and 99th percentile of observations on risk and lending volume. In addition, the results remain robust when the sample is limited to only non-government owned banks.

8 Conclusion

A great deal of attention as of late has been generated by the bailouts of financial sectors worldwide mainly because the costs of such an intervention are significant and the degree of efficacy and long term consequences are unknown. Although the intent of government intervention is to decrease systemic risk and restore lending, a major engine of economic growth, recapitalization may create perverse long term incentives to pursue risk-taking, as this paper suggests. Further, recent critics of the U.S. program have pointed to evidence that recapitalized banks are not increasing lending but rather funneling the increased capital elsewhere. This paper conducts an empirical assessment of whether recapitalization leads to changes in risk and liquidity, and on-balance whether the relationships are positive or negative.

The results indicate that recapitalization is associated with increased insolvency risk, providing evidence for the relatively larger effect of moral hazard-type outcomes. However, there is also evidence that this relationship is more nuanced. Namely, this effect is also driven by the increased risk taking of recapitalized in addition to the change in behavior of non-recapitalized banks. Perhaps, now confronted with the reality that they will not be bailed out, the managers of these banks decide to build an internal safety net by taking on less risk. This has further implications for bank regulation going forward and for all bank stakeholders. In addition, a bank recapitalization program may induce changes in the two groups that are long-lasting. This implies that policymakers are justified in their concerns that recapitalization may have significant consequences in the future.

From a business policy perspective the results have implications for all bank stakeholders following the implementation of a bailout program. For shareholders and depositors, evidence

that bank managers may increase risk-taking after being bailed out provides information relevant to decision making regarding which bank to conduct business with in the future based on risk preferences, as managers in recapitalized banks may take on more risk while those in non-recapitalized banks take less risk. For the government, the results indicate that recapitalization is a successful tool for stimulate lending, but most effective for larger banks and when combined with an asset purchase program. Further, the bailout program is also seen to engender greater risk-taking, implying that although the program is successful at stimulating lending, it does not come without the unintended cost of increasing risk-taking in the long term.

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Appendix

Risk Measure

A modified distance to default measure is used to measure risk. When π is the value of profits and K is capital, and insolvency is presumed to occur when current losses exhaust capital $-\pi>K$, estimates of the likelihood of insolvency, p may be obtained by noting that

$$(\pi/A)<-(K/A) \quad (1)$$

is equivalent to this likelihood p, where (π/A)represents the return to assets (ROA) and (K/A) the capital-assets ratio (CA). Then standardizing both sides of (1), insolvency occurs when

$$((ROA-\mu_{ROA})/(\sigma_{ROA}))<((-CA-\mu_{ROA})/(\sigma_{ROA})), \quad (2)$$

It follows that the probability of insolvency is equal to

$$\Phi((-CA-\mu_{ROA})/(\sigma_{ROA})) \quad (3)$$

and assuming symmetry of the distribution can be written as

$$\Phi((\mu_{ROA}+CA)/(\sigma_{ROA})) \quad (4)$$

where $((\mu_{ROA}+CA)/(\sigma_{ROA}))$represents the number of standard deviations between the expected value of the return to assets and (negative values of) the capital-assets ratio, and σ_{ROA} is the standard deviation of the return on assets. Then, if profits are normally distributed, the inverse of the probability of insolvency (4) equals:

$$((\mu_{ROA}+CA)/(\sigma_{ROA})) \quad (5)$$

The value in (5) is defined as the z-score, a widely used measure of insolvency risk (Laeven and Levine 2008, Hannan and Hanweck 1998, Scott 1980).[14]

[14] The normality assumption can be relaxed. Then, a bound for the probability of insolvency p can be obtained using Chebyshev's inequality such that $p\leq(1/2)\sigma_{ROA}^2/((E(ROA)+CA)/(\sigma_{ROA}))^2$

A higher z-score indicates that the bank portfolio is less risky and more stable.

A higher z-score indicates that the bank is more stable. Because the z-score is highly skewed, and for purposes of interpretation, we use the natural logarithm of the z-score, which is normally distributed.

Further details on IBRA

Loan Transfer

Loans were transferred at book value, which created incentives for IBRA to hold, rather than dispose of the assets. IBRA's strategy toward debt restructuring was to focus on large debtors, while outsourcing or selling small- and medium sized loans. The smaller retail and SME loans were sold through open auctions, while medium-sized commercial loans were outsourced in batches to servicing agents through a competitive bidding process. As for the largest corporate debtors, the approach focuses on restructuring the loans of the cooperative debtors and taking legal action against the non-cooperative debtors , and selling restructured loans to a competitive bidding system. Later, there was a shift towards direct loan sales at discounts.

Government Involvement Post-Bailout

Following recapitalization, the extent of operational restructuring by IBRA in banks that actually took place is not clear. Initially, the intent was to install IBRA employees and/or replacement management from state banks to supervise the recapitalized banks and participate in management. Whether the implementation proved too difficult or ideology changed, it is unclear whether these supervisory and management changes were carried out (Enoch et. al 2001). Even within the IBRA organization, manpower issues were difficult to overcome. Because thousands of Indonesian personnel were required just to staff IBRA, employees of several international consulting and accounting firms were hired to supplement the workforce and often were placed directly in banks in supervisory roles. There was even a limit to the ability of this foreign staff to meet the shortfall in domestic personnel, given the complexities of operating in Indonesia and the sheer magnitude of the project (Pangetsu et. al 2002).

Table 1. Asian Financial Crisis Timeline	
Pre-July 1997	30 year period of steady economic growth
Jul-97	Devaluation of the Thai baht
Aug-97	Indonesia rupiah (IDR) begins period of volatility
Oct-97	First IMF package announced; 16 banks closed immediately
Jan-98	Indonesian Bank Restructuring Agency (IBRA) established
May-98	Suharto resigns
1999,2000	Recapitalization implemented
Apr-04	IBRA closed

Table 2. Ownership Structure of Indonesian Banking Sector				
Ownership type	1997	2004	% Survived	% Recapitalized
Government	7	5	100%*	100%
Private Domestic	147	82	56%	24%
Foreign	12	12	100%	50%
Regional Development	27	25	93%	44%
Joint Venture	32	24	75%	16%
Total	225	148		

*This is due to mergers

Table 3. Summary Statistics Pre-Recapitalization				
Average	Non-Recap Firms	Recap Firms	Difference	Standard Errors
Employees	666	2202	-1536	545**
Branches	17	37	-20	8.9**
Total assets*	9872	39269	-29397	7735**
Total deposits*	1478	6343	-4865	1108**
Total loans*	13602	30739	-17137	10537
Total profits*	106	-226	332	317

*in hundreds IDR
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Probit Estimates of Recapitalization

VARIABLES	Coef.	S.E.	Coef.	S.E.
Employees	0.17	0.66	0.13	0.13
Deposits	0.00	0.01	0.00	0.01
Assets	0.00	0.00	0.00	0.00
Loans	0.00	0.00	0.00	0.01
CAR	-1.3	0.81	-1.42	1.13
Fit and Proper	0.94***	0.03	0.96***	0.04
Georaphic Location 1	-0.99***	0.01	-0.95***	0.26
Georaphic Location 2	-0.99***	0.00	-0.99***	0.04
Georaphic Location 3	0.01***	0.09	0.56	1.52
Geographic Location 4	-0.537***	0.10	-0.51***	0.14
Ownership Type 1	-0.58***	0.11	-0.57***	0.14
Ownership Type 2	0.56**	0.27	0.85***	0.15
Ownership Type 3	0.14	0.64	0.53**	0.26
Ownership Type 4	-.89***	0.05	-0.82***	0.09
Age	.	.	0.01	0.01
Cash	.	.	-0.01	0.01
Average Shares Held	.	.	0.01	0.01
Proportion Connected Loans	.	.	0.33	2.52
Observations	145		145	
Firms Correctly Classified	96%		97%	

*** p<0.01, ** p<0.05, * p<0.1

Geographic Location 1= Jakarta, Geographic Location 2= Multiple Metropolitan Areas, Geographic Location 3= One province, not only metro, Geographic Location 4= Multiple provinces, not only metros, Omitted Geographic Location= Nationwide

Ownership Type 1= Government Owned, Ownership Type 2= Private Domestic, Ownership Type 3= Foreign, Ownership Type 4= Regional Development, Omitted Ownership Type= Joint Venture

Calculated at Pre-1997 Averages

Table 5. Desriptive Statistics for Risk Measure (Zscore)

	Recapitalized Banks			Non-Recapitalized Banks		
	Before	After	Change	Before	After	Change
Z-score id	1.89	2.82	0.93	1.99	7.01	5.02
	(3.75)	(10.6)	(.59)	(3.01)	(13.9)	(.65)***
Between-group differences	0.1	4.5				
	(.24)	(.76)***				

*** p<0.01, ** p<0.05, * p<0.1

Standard deviation in parenthesis for before and after
Standard error of estimate in parenthesis for change

Table 6. Desriptive Statistics for Lending

	Recapitalized Banks			Non-Recapitalized Banks		
	Before	After	Change	Before	After	Change
Lending Volume	-20597	1698892	1719490	111600	138745	27144
	(217396)	(223105)	(370379)***	(62789)	(72026)	(109326)
Between-group differences	132197	-1560147				
	(200419)	(239591)***				

*** p<0.01, ** p<0.05, * p<0.1
Standard deviation in parenthesis for before and after
Standard error of estimate in parenthesis for change

Table 7: Estimates of the Impact of Recapitalization on Risk and Lending

VARIABLES	(1) Z-score id	(2) Z-score year	(3) CAR	(4) Lending Volume
Recapitalized * Post	-.44***	-.43***	-0.45*	36000***
	(.16)	(.16)	(0.24)	3796
Post	-.65***	1.69***	1.58***	-6400*
	(.23)	(.40)	(0.22)	(3720)
Constant	.49***	.51***	-3.50***	1009
	(.12)	(.12)	(0.15)	(1355)
Observations	2227	2227	1747	1671
R-squared	.34	.37	0.26	.18
Firms	148	142	149	148

*** p<0.01, ** p<0.05, * p<0.1

Recapitalized=1 if a firm was recapitalized

Post=1 for post-recapitalization years

Robust standard errors in parentheses clustered at the firm level

Z-score id= $\log((ROA_{it}+CA)_{it}/\sigma(ROA)_{i,}$ which measures insolvency risk using within firm variation over

Z-score year= $\log((ROAit+CA)_{it}/\sigma(ROA)_{t}$ which meaures insolvency risk between firm varation within a time period

CAR=log((Tier 1 capital + Tier 2 capital) /Risk-

Lending Volume in hundreds Indonesian rupiah (IDR)

Table 8: Estimates of the Impact of Recapitalization on Risk (Placebo)			
VARIABLES	(1) Z-score id	(2) Z-score year	(3) Lending Volume
Recapitalized * Post	-0.007	0.021	179005
	(0.195)	(0.198)	(116031)
Post	-0.383***	-0.372***	-21613
	(0.119)	(0.120)	(23183)
Constant	0.06	0.126**	122584***
	(0.041)	(0.059)	(32701)
Observations	513	513	403
R-squared	0.171	0.172	0.047
Firms	143	143	141

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses clustered at the firm level

Z-score id = $\log(zscore)_{it}=((ROA_{it}+CA)_{it}/\sigma(ROA)_i$

Z-score year= $\log((ROAit+CA)_{it}/\sigma(ROA)_t$ which meaures insolvency risk between firm varation within a time period

Recapitalized is an interaction term of the recapitalized indicator and a post-recapitalization time indicator

Lending Volume is equal to the flow of disbursed credit in Indonesian rupiah

Table 9: Estimates of the Impact of Asset Purchase on Lending Volume

VARIABLES	(1) Z-score id	(2) Z-score year	(3) CAR	(4) Lending Volume
Recapitalized *Post *Asset Purchase	0.641*	0.625*	0.107	32600**
	(0.355)	(0.355)	(0.109)	14900
Recapitalized * Post	-0.532***	-0.518***	-0.0400	3074**
	(0.167)	(0.167)	(0.0533)	1299
Post	-0.524**	-0.141	0.0410	4332*
	(0.214)	(0.214)	(0.0623)	2355
Constant	0.353***	-0.370***	0.107***	1576
	(0.0877)	(0.0880)	(0.0226)	1046
Observations	1,588	1,588	1,937	1801
R-Squared	0.336	0.965	0.031	0.13
Number of firms	148	148	149	148

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses clustered at the firm level

Lending Volume is equal to the flow of disbursed credit in hundreds Indonesian rupiah

Recapitalized *Post *Asset Purchase is an interaction term of the recapitalized indicator, post indicator and an indicator

Z-score 1= $\log((ROA_{it}+CA)_{it}/\sigma(ROA)_{I,}$ which measures solvency risk using within firm variation over time

Z-score 2= $\log((ROAit+CA)_{it}/\sigma(ROA)_{t}$ which meaures between firm varation within a time period

CAR=log((Tier 1 capital + Tier 2 capital) /Risk-weighted Assets)

Table 10: Estimates of the Impact of Recapitalization on Risk with Additional Controls				
VARIABLES	(1) Z-score 1	(2) Z-score 2	(3) CAR	(4) Lending Volume
Recapitalized * Post	-0.45***	-0.46***	-0.47*	2790*
	(0.16)	(0.16)	(0.24)	(1600)
1996 Employee count * Post	-.02	-.02	.11	4.18***
	(.002)	(.002)	(.003)	(.19)
Post	0.80***	2.74***	1.57***	-6090***
	(0.19)	(0.19)	(0.23)	(2326)
Constant	0.50***	-1.47***	-3.51***	2097***
	(0.12)	(0.12)	(0.15)	(727)
Observations	1,685	1,685	1,747	1,801
R-squared	0.33	0.97	0.26	0.238
Firms	148	148	149	149

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses clustered at the firm level
Post=1 for the post-recapitalization years
Z-score 1= $\log((ROA_{it}+CA)_{it}/\sigma(ROA)_{i,}$ which measures solvency risk using within firm variation over
Z-score 2= $\log((ROAit+CA)_{it}/\sigma(ROA)_{t}$ which meaures between firm varation within a time period
CAR=log((Tier 1 capital + Tier 2 capital) /Risk-weighted Assets)

Table 11. CAR Calculation

CAR= Tier 1 + Tier 2 Capital
Risk Weighted Assets

Tier 1 Capital	Tier 2 Capital	Asset Weights	
Current earnings	General provisions	Cash	0
Current year's profit after tax	Hybrid instruments	Government bonds	0
Decrease in value of portfolio equity	Revaluation reserves	Outstanding foreign exchange contracts	0.03
Designated reserves	Subordinated debt	Interbank loans	0.2
General reserves	Undisclosed reserves	Acceptances	0.2
Last year's profit after tax		Interbank placement	0.2
Other capital conributions		Mortgage loans	0.5
Paid in capital		Performance bonds, buid bonds, warranties	0.5
Positive adjustments		Revolving underwriting commitments	0.5
Retained losses		Loans (besides mortgage)	100
		Standy letters of credit	100
		Fixed assets (net of dep)	100
		Other assets	100
		Loan repayment guarantees and acceptances	100
		Purchase and resale agreement (reverse repo)	100

Figures

Figure 1. Time Series of Risk MeasureBetween Recapitalized and Non-Recapitalized Banks

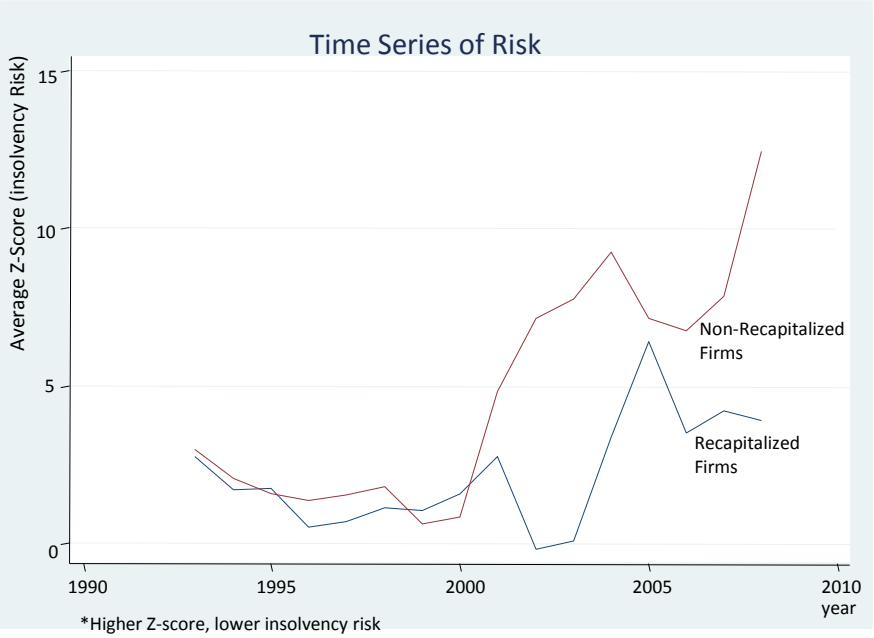
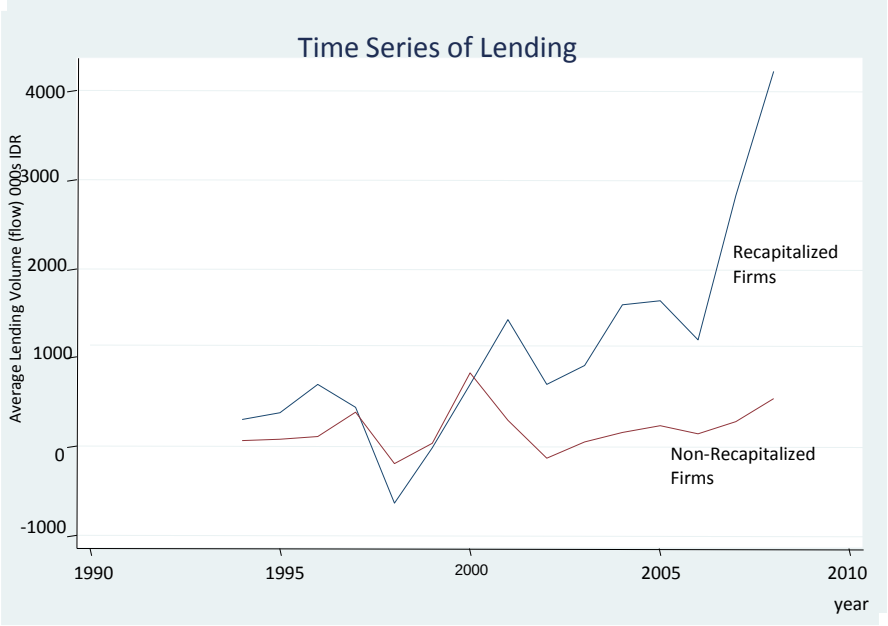


Figure 2. Time Series of Average Lending Volume between Recapitalized and Non-Recapitalized Banks



Figures (continued)

Figure 3. Time Series of Average Lending Volume between Recapitalized and Non-Recapitalized Banks