

# **Banking Sector Reforms and Corporate Borrowing Costs in Emerging Markets**

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## **Abstract**

Using a panel dataset of syndicated bank loans in emerging markets, we examine how domestic credit market sector reforms affect the cost of corporate borrowing in emerging markets. We find that reforms that improve bank competition and facilitate bank privatization lead to lower borrowing costs, suggesting that these reforms improve efficiency in credit markets. In addition, reforms that tighten bank supervision increase loan yield spreads, consistent with better risk pricing with more effective oversight. Furthermore, the impact of these reforms on corporate borrowing costs is closely linked to the quality of institutions in a country. Specifically, bank competition and bank supervision reforms affect corporate borrowing costs primarily in countries with low corruption and well-functioning legal environments. Bank privatization reforms are effective in countries with a better investment profile. Overall, these results suggest that the success of domestic financial reforms in improving credit markets is linked to the institutional environment.

**Keywords:** Bank, Loan, Credit spreads, Credit market reforms

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## 1. Introduction

Countries employ domestic banking reforms to improve credit market efficiency and thereby foster economic activity and growth. If these reforms reach their objective, they should lead to better risk pricing and improve funding opportunities for firms without leading to a build-up of systemic risks.

There are several country level studies that examine the impact of banking deregulation. For example, Cetorelli and Strahan (2006) look at US data and find that bank competition removes entry barriers for small firms. Bertrand, Schoar, and Thesmar (2007) examine the French banking system and find that banking sector efficiency increases with deregulation. Guiso, Sapienza and Zingales (2007) look at the time series variation in bank competition for the Italian banking sector across provinces. They show that with increasing bank competition, loan spreads decline, availability of credit increases but nonperforming loans increase. In addition to country level studies, Demirguc-Kunt, Laeven and Levine (2004) examine net interest margins averaged over 1995-1999 for 26 countries and find that bank reforms reduce net interest margin but this effect disappears when property rights are controlled for.

In addition to studies that find positive effects of bank reforms, some others such as Demirguc-Kunt and Detragiache (2002) find that these reforms can have destabilizing effects on the economy. Similarly Kaminsky and Schmukler (2008) find that in the short term financial liberalization policies lead to destabilization but in the long run they trigger reforms to improve institutions.

In this paper, we present new evidence on how domestic credit market reforms affect the cost of credit for corporations. We use a new and detailed data on credit market reforms developed by Abiad, Detragiache and Tressel (2009) (ADT, henceforth) and utilize a panel dataset on syndicated bank loans to emerging market corporations over the period 1994-2004. We examine the variation of the cost of credit due to credit market reforms within a country.

The impact of domestic credit market reforms on corporate borrowing terms is an open empirical question. Better risk pricing following reforms such as bank supervision can lead to higher rates if improper risk determinations prior to reforms resulted in relatively cheaper borrowing. On the other hand, credit market reforms such as bank entry and bank privatization can lead to lower borrowing costs by increasing competition in the credit markets and by increasing efficiencies in bank operations. In this paper, we focus on these issues.

The contractual environment of a country has been documented to be an important determinant of corporate borrowing costs. For example, Qian and Strahan (2007) find that loan spreads are lower in countries with better creditor rights. Similarly, Bae and Goyal (2009) find that better property rights lead to lower yield spreads. While examining the impact of credit market reforms on corporate borrowing costs, we also look at whether the effects of these reforms are related to the institutional environment.

We consider four domestic financial reforms from the ADT dataset that indicate changes in the credit market laws. These reforms are bank competition, removal of barriers in credit allocation, bank privatization and bank supervision.<sup>1</sup> We also average these four dimensions to obtain an overall index of credit market reforms.

Examining the impact of overall domestic financial reforms on corporate borrowing costs using the index, we find that corporate loan yields decrease with credit market reforms. Thus, on the overall, domestic financial reforms lead to lower cost of financing for the corporations, suggesting that these reforms reach the objective of improving external funding terms for corporations.

We also look at the reforms one at a time. Our results indicate that corporate borrowing costs decrease following bank competition reforms that remove the barriers of bank entry and

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<sup>1</sup> We focus on credit market reform measures that have within-country variation over the period 1994-2004.

geographical restrictions, and increase the scope of bank activity and licensing. Corporate borrowing costs also decrease following bank privatization policies. The findings suggest that these credit market reforms mitigate the inefficiencies in credit markets and lower the external cost of funding for corporations. Our results show that corporate yield spreads are higher in countries that adopted tighter bank supervision such as risk based capital ratios, independent supervisory agency and effective supervisory oversight. This evidence is consistent with the notion that corporations that were able to reach cheaper bank financing before the reforms due to possible improper risk pricing end up paying higher prices that better reflect risk after these reforms.

Next, we explore the linkages between institutions and reforms in relation to cost of credit. We consider an index of institutional quality including law and order, lack of corruption and investment profile of a country. We also consider these institutional characteristics separately. Our findings show that bank competition reduces spreads in countries that have well-functioning legal environment and low corruption. Bank supervision is also more effective in these countries. Bank privatization policies are more successful in reducing funding costs of corporations in countries with better investment profile including better property rights, contract viability, and payments repatriation. Thus, credit market reforms are successful in increasing the efficiencies of credit markets in countries with better institutions.

Overall, our evidence shows that credit market reforms have an important impact on the external funding costs of corporations in emerging markets. Furthermore, this impact is closely linked to the quality of institutions. As a result, the success of domestic credit market reforms closely linked to the institutional environment of a country.

The rest of the paper is as follows. Section 2 describes the data and methodology, Section 3 examines the impact of reforms on loan spreads and Section 4 concludes.

## **2. Data and Methodology**

We first explain the data source in the next subsection, then discuss the descriptive statistics and lastly give the details of our empirical specification.

### **A. Data**

We utilize a number of sources in order to collect data on loan characteristics, firm characteristics, macroeconomic variables and credit market reforms.

In our loan dataset, we have data for 15 emerging market countries over the period of 1994-2004. The countries covered in the sample are given in Appendix 1. We use Dealogic to obtain the loan data.

#### *Loan variables*

Loan characteristics i.e. loan spreads, loan maturity, loan size, the currency of the issue, purpose of issuance and whether it is a term loan or line of credit are from this database. The loan spread is measured as spread over LIBOR including all fees and are given in basis points. We use the natural logarithm of spreads in our empirical model. A dummy variable captures issues in major currencies, i.e. U.S. dollars, British pounds, German DM, Euros or Japanese yen. We control for the loan size by including in the regressions the natural logarithm of the size of the loan. We include an indicator for term loans. We include loan purpose dummies for debt repayment, acquisition activities, working capital and corporate and project financing. We exclude loans to firms in the heavily-regulated financials and utilities sectors (SIC codes 6 and 9) as these loans would be expected to be priced differently than loans to firms in other industries. As a result, we have 1030 observations with loan spreads and other loan control variables.

#### *Firm variables*

To control for firm variables, we manually match the loan sample with the Worldscope database. As firm level controls, we include leverage, profitability, tangibility, size, whether the firm has

credit rating or not and a dummy if the rating is high yield. We calculate size as the natural logarithm of market capitalization, leverage as total debt over total assets, tangibility as net plant property and equipment over total assets and profitability as net income over total assets. Since firm level controls are not available for all the loans, this sample consists of 262 observations and 11 countries. Number of observations in each country is given in Appendix 1.

### *Credit market reforms*

The measures of credit market reforms are from the ADT dataset. This dataset covers seven dimensions of reforms. We utilize four of them: Bank privatization, bank supervision, bank competition and removal of barriers in credit allocation.<sup>2</sup> The bank privatization measure is based on the state ownership of banks in a country. Bank competition is based on the measures that remove the barriers of bank entry, scope of bank activity, licensing and geographical restrictions. The bank supervision component looks at the effectiveness of supervision practices in the country such as risk based capital ratios, independence of supervisory agency from political power, effectiveness of on site and off site examinations and if there are supervisory oversight exemptions or not. Finally, the credit allocation measure is based on whether there are excessively high reserve requirements or not and also on the removal of credit controls such as directed lending, subsidized credits and ceilings on credit expansion. The details of the index are given in Appendix 2. We use one year lags of these variables as policy changes are expected to work with lags. We discuss the implications of each reform below:

Bank competition: Competition in the banking sector, including foreign bank entry, should result in more efficiency in the banking sector. The increased efficiency should reflect into credit markets as increased credit and lower yield spreads. In the ADT dataset, bank competition is

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<sup>2</sup> Among the other series compiled by ADT, we do not include securities market reforms as most countries had liberalized their securities markets by 1994 and also our main focus is on credit markets. We do not include capital account liberalization as we refer to another source for this variable, which is used as a control for financial openness. Lastly, we do not include interest rate controls due to minimal variation of this variable during the period from 1994 to 2004.

determined according to several dimensions: restrictions on the participation of foreign banks; restrictions on the scope of banks' activities; restrictions on the geographic area where banks can operate; or excessively restrictive licensing requirements.

Bank supervision: Effective bank supervision should lead to better functioning banking system and tighter lending standards. While better functioning banking system can lead to easier or cheaper credit, tighter lending standards can lead to higher yield spreads. In the ADT dataset, this reform variable is constructed according to the following dimensions: Risk-based capital adequacy ratios based on the Basle I capital accord; Independence of the banking supervisory agency from the executive's influence and whether it has sufficient legal power; existence of exemptions for certain financial institutions from supervisory and effectiveness of on-site and off-site examinations of banks.

Credit allocation: Changes in credit allocation in the banking system by removing preferential treatments of certain sectors can lead to higher borrowing costs for sectors that were benefiting from government subsidies but it can lead to lower spreads for firms that were not able to tap into the subsidized lending in the banking sector. In the ADT dataset, this reform variable is constructed according to these dimensions: Minimum amount of credit that must be channeled

to certain sectors; whether there are ceilings on credit to some sectors or not; subsidized rates to directed credits; ceiling on the overall rate of expansion of credit; level of reserve requirements.

Bank privatization: Improved efficiencies in bank operations after privatization should lead to better risk pricing and a more competitive market. As a result, these developments should lead to better lending practices and can lead to lower yield spreads. However, politically connected firms might observe higher yield spreads after privatization due to the elimination of their preferential status. In the ADT dataset, this reform variable is formed according to the share of banking sector assets controlled by state-owned banks. The level of bank privatization is determined using thresholds of 50 percent, 25 percent and 10 percent of state ownership. Decreasing state ownership corresponds to higher values of bank privatization variable.

### *Institutional environment*

Regarding the institutional environment of a country, we construct an institutional quality index using the Political Risk Group's *International Country Risk Guide* (ICRG) database. We

consider three components for this measure: Corruption, law and order, and investment profile. We scale each of these measures so that they vary between zero and one. We average all these measures to form the index. We also consider these variables separately. Investment profile measures contract viability/expropriation, profits repatriation and payment delays; the corruption index considers excessive patronage, nepotism, job reservations, favor-for-favors, secret party funding and suspiciously close ties with politics and business; law and order measures the strength of legal system and popular observance of law. The higher is the score, the higher the institutional quality.

### *Macroeconomic controls*

As for macroeconomic controls we use the natural logarithm of real GDP per capita for financial development, real GDP growth for business cycles, real interest rates for borrowing cost in general, stock market volatility for default risk, and sovereign ratings for overall country risk. We also control for the financial openness of a country with a de jure measure constructed by Chinn and Ito (2008).<sup>3</sup> Real GDP per capita and real GDP growth are calculated using data from the IMF's *World Economic Outlook*. Real interest rates are calculated as  $(1+r)/(1+i)$ , where  $r$ , the nominal interest rate and  $i$ , inflation are both from the IMF's *International Financial Statistics* (IFS henceforth). Sovereign ratings are from Standard and Poor's. Sovereign ratings are assigned values between zero and 20 where a value of 20 corresponds to AAA and a value of zero corresponds to sovereign default. Stock market volatility is calculated over three years using monthly data from IFS for major economies and DataStream and Bloomberg for emerging markets. Private credit to GDP is from Barajas, Dell'Ariccia and Levchenko (2008), which is formed by taking into account the structural breaks trends in this variable. We use the lag of this

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<sup>3</sup> Chinn and Ito (2008) construct a de jure measure of financial openness based on the absence of controls on cross-border transactions. For these controls, they mainly consider the presence of multiple exchange rates, restrictions on current account transactions and capital account transactions as well as requirement of surrender of export proceeds. We use one year lag of the openness variable as well since it reflects policy changes and thus will work by delay.

variable since we it is used as an instrument for the issuance decision, as discussed in the methodology section. We control for banking crisis by putting a dummy for those years. Banking crisis dates are from Laeven and Valencia (2008).

## **B. Descriptive Statistics**

Table 1 reports the descriptive statistics. Panel A reports the statistics for the sample of 262 observations with loan spreads and firm controls. The mean loan spread in the sample is 179 basis points and varies between 5 and 925 basis points. The average maturity of loans is around 4 years, whereas the shortest is 6 months and longest is 16 years. Loan size is \$163 million on the average and varies between \$2 million and \$875 million. Around 90 percent of the loans are in major currencies and 85 percent are term loans. Around 30 percent of the firms that issue loans have bond ratings, 16 percent of them being high yield. The major purpose of the loans is corporate financing and debt repayment. When we examine the credit market reforms, we see that there is variation in both the index and its components. The average reform index is 64 percent and varies between 17 percent and 92 percent. There is variation in the institutional quality as well, where it averages at 57 and ranges between 26 and 89. When we examine firm level variables, we see that there are companies with high debt as well as ones with no debt, average leverage being 0.32. Average firm size is \$929 million. In the sample, there are firms with profit as well as loss, where average profitability is 0.04. There are firms with very low and very high tangibility, with the average of 0.57.

In Panel B, we document mean values of the variables for each of the 11 countries that are in the sample. There is variation in most of the variables across countries. While there are countries with relatively lower mean spreads such as Chile, there are also ones with relatively high loan spreads such as Brazil and Venezuela. Loan maturities vary between 3 and 7 years. Average loan size in each country is above 100 million dollars.

In Panel C, we document yearly statistics of loan spreads, loan issuance and the change in credit market reforms. While loan spreads and loan issuance is averaged over all loan observations in that year, credit market reforms are averaged over the countries in that year so as not to include multiple counts of the reform variables for countries with more than one loan issuance in that year. Average loan spreads are above 100 basis points and loan issuance is above \$100 million in each year. When we look at the reform variables, we observe that they change over time (values not equal to zero). Although we mostly see a positive change in the reform variables, i.e. improving credit markets, there are a few cases where credit market reform on the average deteriorates as shown for bank privatization and credit allocation. As an example, in Appendix 1, Panel B, we provide the details of the credit market reforms for Mexico. This panel shows the value of each reform in each year for Mexico. As can be observed, credit market reform variables vary through time.

### C. Methodology

Our variable of interest is loan spreads on syndicated loans. In our empirical specification we control for loan characteristics, macroeconomic variables and firm level variables. The empirical model is as follows:

$$\begin{aligned} \text{Log}(\text{Spread})_{ijct} = & \beta_0 + X_{ict}\beta_1 + Z_{ct}\beta_2 + \text{FINREFORM}_{ct-1}\beta_3 + \text{INST}_{ct}\beta_4 \\ & + \text{INST}_{ct} * \text{FINREFORM}_{ct-1}\beta_5 + \varepsilon_{ijct} \end{aligned} \quad (1)$$

In above equation,  $\text{Log}(\text{Spread})_{ijct}$  is the natural logarithm of basis points of spread over LIBOR on loan  $i$  of firm  $j$  in country  $c$  at time  $t$ .  $X_{ict}$  are loan level controls,  $Z_{ct}$  are macroeconomic controls.  $\text{FINREFORM}_{ct-1}$  is either the credit market reform index or the components of the index. Both the credit market reform index and its components are measured by a one year lag since the policies on credit market reforms would be reflected on the corporate

borrowing terms with a delay. This approach also alleviates endogeneity concerns. However, we should note that it is still possible that a latent variable can affect both credit market reforms as well as corporate loan yield spreads. To mitigate this issue, we include a large range of controls at the country level and include country effects. Institutional variables are represented as  $INST_{ct}$ . Since we are also interested in how institutions shape the impact of reforms on corporate borrowing terms, we interact credit market reforms with the institutional variables included in the model. To control for firm level variations, we include firm level factors that affect spreads. As a measure for global economic developments such as global economic cycles and global shocks that affect financial markets, we include year dummies. To control for global industry shocks, we include industry dummies. In the estimations, we use country clustered standard errors to correct for residual dependence (see Petersen (2007) and Cameron, Gelbach and Miller (2006)).

### **3. The effects of credit market reforms on the cost of credit**

#### **A. Credit Market Reforms**

We examine the effect of credit market reforms on corporate borrowing costs in Table 2. In column 1, we present results with the credit market reform index. In columns 2-5, we include each reform separately one at a time, and in column 6, we include all reforms together.

The results in column 1 show that, on the overall, credit market reforms lead to lower corporate borrowing costs. Thus, corporations are able to obtain cheaper financing in the syndicated loan market following credit market reforms. This finding is both statistically and economically significant. When credit market reform index increases by one standard deviation from its sample mean of 0.64 to 0.83, loan spreads reduce by 84 basis points for a loan with 185 basis points spread (the loan spread evaluated at mean values of the regression variables). When we examine remaining variables, we observe that loan spreads are lower in countries with better sovereign ratings, showing the importance of country credit risk while determining corporate

loan yield spreads. Among loan and firm characteristics, loan spreads are also higher for major currency denominated loans. It is possible that these loans are from countries that have more local currency risk, which is reflected in the loan spreads. Corporate borrowing costs are lower for firms with bond ratings. Firms with bond ratings can raise funds from public debt markets, which creates an alternative funding source for these firms and thus increases competition in the syndicated loan market, which is discussed in detail in Hale and Santos (2009). Loan spreads are higher for firms with high leverage, suggesting that increased bankruptcy risk or firm distress by increased leverage reflects into higher loan spreads due to amplified credit risk for these firms. Yield spreads are lower for larger firms. Large firms have low information asymmetry and more collateral to offer, which reduces the adverse selection and moral hazard risks for the banks.

On the overall, the findings with credit market reform index show that these reforms reduce corporate borrowing costs. However, each of these reforms can have a different impact on the cost of debt financing for corporations. Therefore, combining these reforms in an index can provide us a big picture on the success of reforms, but it will fall short of providing us the individual effects of each reform. Some reforms such as bank competition remove the entry barriers for banks, which can create an environment where banks charge lower spreads to attract customers. On the other hand, bank supervision reforms tighten supervisory oversight, which leads to better risk pricing. Tight oversight can lead to an increase in loan spreads if corporations were able to reach cheaper funding before the reforms due to improper risk adjustments. In this respect, it is important to consider bank competition, bank supervision, bank privatization and credit allocation separately.

As reported in columns 2-6 of Table 2, among the components of the financial reform index, bank competition and bank privatization lead to lower corporate loan yield spreads, whereas bank supervision increases spreads. Credit allocation does not have a significant effect. Including all these reforms together in column 6 does not alter these findings. These results

suggest that all reforms do not move spreads in the same direction. Hence considering these reforms together can mask the impact of each individual reform. Allowing bank entry through bank competition reforms reduces cost of funding domestically as more banks try to win the same customers. The effects of this competition, in turn, is reflected in the syndicated loan spreads, since syndicates also need to offer lower spreads to be comparable with the domestic market. Bank supervision, on the other hand, tightens the lending standards of the banks. Accordingly, banks charge higher rates for riskier borrowers. The change in this domestic development is reflected to the syndicated loan market as higher loan spreads. Allowing bank privatization helps banks to operate more efficiently. Consequently, they can offer cheaper funding alternatives to corporations. Again syndicates lower spreads to be comparable with the local credit market.

Overall, these findings show that credit market reforms improve efficiencies in the credit market. These improvements can lead to lower funding costs by allowing cheaper alternative sources of funding as observed with bank competition or bank privatization reforms. Alternatively, they can lead to better risk pricing reflected in higher funding costs as observed with bank supervision reforms. Thus, each credit market reform can have a different effect on corporate debt financing costs.

### **C. Contractual environment**

La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998) and subsequent research show the importance of institutional environment in financial development. Qian and Strahan (2007) and Bae and Goyal (2009) examine the impact of legal framework and institutions on loan characteristics using cross country syndicated bank loan data. They show that the cost of credit is cheaper and loans are more favorable in countries with better creditor rights and property rights. Our baseline regressions also show that spreads are substantially lower in countries with better institutions.

Since institutional framework plays an important role in shaping corporate financing terms, it is useful to consider how credit market reforms affect the cost of credit in relation to the quality of institutions. Adopting these reforms without the oversight provided by strong institutions can lead to ineffective implementation of these reforms and therefore they can fail to achieve the improvements in credit markets. To explore this issue, we consider law and order, investment profile and the lack of corruption in relation to the credit market reforms. We also consider these three factors together in the institutional quality index. Table 3 reports the results.

We find that in countries that have low corruption, bank competition reduces loan spreads and bank supervision increases spreads. As it can be observed, while the coefficients on the interaction of these reforms with lack of corruption is significant, the coefficients on reforms themselves are not. These findings suggest that when corruption is high, implementation of these reforms does not proceed properly, and therefore they are not as successful in reducing inefficiencies in the credit markets.

When we examine the law and order component, we find that the results are comparable to those found with low corruption. Bank competition and bank supervision affect spreads primarily in countries where there is a well-functioning legal system. When legal system does not function properly, adopting credit market reforms without proper implementation may not be sufficient in providing a better credit market environment for the corporations.

Investment profile includes property rights, profits repatriation and payment delays. Privatizing banks should affect the corporate cost of funding, especially when these banks can operate in an environment that is investment friendly. We find that investment profile affects the relation between bank privatization and yield spreads. Bank privatization reforms reduce loan spreads considerably in countries that have better investment profile. We also include all these institutional components in an index in column 4 of Table 3. The results are largely supportive of previous arguments.

The results discussed so far highlight the importance of the interaction between reforms and institutional variables. In this regard, we also examine the economic significance of these interactions. When the lack of corruption increases by one standard deviation from the sample mean of 0.5 to 0.75, bank competition reforms reduce spreads by 62 basis points more and bank supervision increases spreads by 21 basis points more for a loan with 154 basis points loan spread (the spread evaluated at the mean of the regression variables). Hence, these reforms have a substantial effect in countries with less corruption. Similarly, when law and order increases by one standard deviation from the sample mean of 0.55 to 0.77, bank competition reforms reduce spreads by 74 basis points more and bank supervision increases spreads by 54 basis points more for a loan with 174 basis points loan spread. Lastly, when investment profile increases from the sample mean of 0.68 to 0.83, bank privatization reduces loan spreads by 73 basis points more for a loan with 196 basis point spread. Overall, these results show that banking sector reforms are considerably more effective in countries with better functioning institutions.

In addition to aforementioned results, we also consider the interactions of institutional variables with credit reforms using indicators that take a value of one if the institutional variable is above the median of the sample for that year. For example, lack of corruption takes the value of one for countries that have corruption levels better than the sample median for that year. These results are given in Appendix 3. As it can be observed, the results are comparable to those documented earlier. These findings suggest for countries with institutional variables that are above the median of the sample, credit market reforms are effective in improving the banking sector.

Overall, our findings show that the success of domestic credit market reforms in improving lending standards and reducing credit market inefficiencies is related to the institutional characteristics of a country. Thus, one should consider the linkages between reforms and institutions in examining how reforms affect the cost of funding for corporations.

### **C. Alternative Specifications**

In Table 4, we include alternative specifications. In column 1, we omit countries that have less than 10 observations so as to observe whether the results are sensitive to the inclusion of countries with fewer observations. The results show that credit market reforms continue to have a negative and significant effect on loan yield spreads, as in Table 2. Thus the impact of credit market reforms on loan yield spreads is robust to excluding countries with fewer observations. The significance of the reform variable is more significant in this specification.

In column 2 of Table 4, we include additional macroeconomic controls. We include inflation to observe whether inflation has an additional impact on loan spreads not captured with real interest rates. We also include M2/GDP ratio to consider the amount of liquidity in a country that can have an impact on the interest rates. The results show that credit market reforms continue to have a negative and significant effect on loan yield spreads. While the coefficient on inflation is not significant, the coefficient on M2/GDP is negative and marginally significant, suggesting that improved liquidity reduces loan spreads.

In columns 3-5 of Table 4, we address the sample selection issue. In columns 3 and 4 we use the sample with firm controls. Column 3 includes firm variables whereas column 4 does not. In column 5, we include the larger sample that has loan characteristics but does not have firm characteristics for every firm in the sample.

In our sample, we observe companies that obtained loans from bank syndicates. We cannot observe those companies that were not able to or did not issue loans. Thus, we check if our sample is affected from sample selection bias, by employing the Heckman (1979) model. To determine firms that did not issue in a given year, we consider all Worldscope sample for the countries in our sample. In the first stage, issuance decision is captured with a dummy that takes a value of one if the company has issued in that year or zero otherwise. We control for macroeconomic and firm level variables. As an instrument, we use one year lag of private credit to GDP. An increase in credit to the private sector increases the availability of domestic bank

loans. Hence, it affects the syndicated loan issue decision but should not have a direct impact on loan spreads. Increasing domestic credit to the private sector increases the availability of credit, which as a result increases loan issuances. We use one year lag of this variable as instrument as the credit availability information should be available for the firms when they make a decision to issue or not. By using the lag of this variable, we also alleviate the concerns that increased credit to domestic sector can have some effect on loan spreads. Such effects should be immediate as market reflects information right away. As a result, the lag of this variable should not have an impact on the loan spreads. In the second stage, loan spreads are determined as in equation (1) conditional on loan issuance. In both the first and second stages, we control for industry, year and country effects. As presented in Table 4, column 3, when firm level variables are controlled, there is no sample selection bias. Including firm level controls captures the effects of corporations' demand for loans and as a result mitigates sample selection issues. As presented in columns 4-5 of Table 4, sample selection bias exist when firm level controls are not included. We observe that the lag of private credit to GDP, the instrument we use for issuance decision, significantly negatively affects the loan issuance decision. As credit becomes available in domestic markets, firms rely less on syndicated bank loans as they are able to raise funds domestically. We also find that syndicated bank loan issuances increase following credit market reforms. This finding is in line with the notion that these reforms reduce inefficiencies in the credit markets, and as a result improve credit availability to the corporations. Overall, the results are in line with those reported without sample selection where credit market reforms reduce loan yield spreads.

#### **4. Conclusion**

In this paper, we examine how credit market reforms affect spreads on syndicated bank loans. As bank credit is one of the major sources of financing for corporations, especially for small firms and for firms in emerging markets, it is important to consider how these reforms affect the cost of

credit. Although the impact of reforms would be more direct in domestic markets, we expect to see an impact in the cost of funding through bank syndicates as these syndicates need to keep the cost of credit comparable to domestic markets to attract or retain borrowers.

Our results show that bank competition and bank privatization lead to lower funding costs for corporations by allowing more banks to compete for customers and by more efficient operation of banks in the private sector. Bank supervision, on the other hand, leads to higher corporate borrowing costs by tightening the lending standards, which promotes better risk pricing. Credit allocation reforms do not have a significant effect on loan spreads. Overall, however, the credit market reforms lead to cheaper cost of credit.

We also show that the effect of credit market reforms on loan spreads is related to the institutional environment. Bank competition and bank supervision reforms affect loan spreads mainly in countries that have low corruption and well functioning legal system. Bank privatization improves bank efficiency and reduces yield spreads in countries with good investment profile. Overall, these findings show that the success of credit market reforms in enhancing the credit markets for corporations should be assessed in the context of the quality of institutions in a country.

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**Table 1**  
**Descriptive Statistics**

This table presents descriptive statistics. For each variable, mean, standard deviation, minimum and maximum values are given. Loan spread is measured over LIBOR including all fees. Loan maturity is in number of years. Loan size is the size of the loan. Major currency is a dummy variable that takes a value of one if the loan issue is in a major currency i.e. U.S. dollars, Euros, German DM, British pound or Japanese yen. Bond rating and High yield are also dummy variables that take value of one when a company has a bond rating and a high yield bond rating, respectively. Term loan is an indicator variable that is assigned a value of one for term loans and value of zero for line of credit. Purpose of loans is also indicator variables. Corporate financing, debt repayment, acquisition, project financing and working capital are controlled through dummy variables. Credit market reforms index is based on four credit market reforms: Bank competition, supervision, privatization and credit allocation. These are from Abiad, Detragiache and Tressel (2008). All reform variables vary between zero and one. Law and order, lack of corruption and investment profile data are from Political Risk Group's *International Country Risk Guide* (ICRG). All these variables are between zero and one. An index of quality of institutions is formed by averaging these three variables. Sovereign ratings are from Standard and Poor's and values are higher for better ratings. Ratings vary between one and 20, 20 being AAA. Real GDP per capita and Real GDP growth are from *World Economic Outlook*. Real interest rates are based on nominal interest rates and inflation, which are obtained from International Monetary Fund's *International Financial Statistics* (IFS). Stock market volatility measures the volatility of the stock market in the last three years. Stock index values are obtained from IFS for developed markets and from Datastream and Bloomberg for emerging markets. Private credit to GDP is from Dell'Ariccia (2008). Financial integration is a de jure measure of openness obtained from Chinn and Ito (2008). Banking crisis is a dummy that takes a value of one at banking crisis years and is obtained from Laeven and Valencia (2008). Firm level variables are from Worldscope and are as follows: Leverage is total debt over total assets; firm size is natural logarithm of market capitalization; profitability is net income over total assets and tangibility is net plant property and equipment over total assets. Panel A gives results for 262 observations that have both spread data and firm level controls. Panel B gives mean values of the variables for each country. Panel C reports yearly statistics on loan yield spreads and loan issuance as well as the change in credit market reforms.

**Panel A: Sample with Loan Spread and Firm Controls**

	Mean	Standard Deviation	Median	Minimum	25th Percentile	75th Percentile	Maximum
<b>Loan Variables</b>							
Loan spread	179.15	120.94	150.00	5.00	83.75	250.00	925.00
Loan maturity	3.95	2.25	4.00	0.50	2.00	5.00	16.00
Loan size(in \$million)	163.00	143.00	120.00	2.00	70.00	200.00	875.00
Major currency	0.91	0.29	1.00	0.00	1.00	1.00	1.00
Bond rating	0.33	0.47	0.00	0.00	0.00	1.00	1.00
High yield	0.16	0.37	0.00	0.00	0.00	0.00	1.00
Term Loan	0.85	0.35	1.00	0.00	1.00	1.00	1.00
Purpose: Corporate	0.33	0.47	0.00	0.00	0.00	1.00	1.00
Purpose: Debt repayment	0.27	0.45	0.00	0.00	0.00	1.00	1.00
Purpose: Acquisition	0.06	0.25	0.00	0.00	0.00	0.00	1.00
Purpose: Project financing	0.06	0.25	0.00	0.00	0.00	0.00	1.00
Purpose: Working capital	0.04	0.20	0.00	0.00	0.00	0.00	1.00
<b>Credit Market Reforms</b>							
Reform index	0.64	0.19	0.67	0.17	0.58	0.75	0.92
Bank competition	0.87	0.16	1.00	0.67	0.67	1.00	1.00
Bank supervision	0.48	0.25	0.33	0.00	0.33	0.67	1.00
Credit allocation	0.70	0.41	1.00	0.00	0.33	1.00	1.00
Bank privatization	0.59	0.27	0.67	0.00	0.33	0.67	1.00
<b>Contractual environment</b>							
Institutional quality index	0.57	0.12	0.53	0.26	0.50	0.63	0.89
Law and Order	0.55	0.22	0.50	0.17	0.33	0.83	1.00
Corruption	0.49	0.12	0.50	0.25	0.40	0.57	0.83
Investment Profile	0.68	0.16	0.68	0.25	0.57	0.82	0.94
<b>Macroeconomic Variables</b>							
Sovereign rating	9.52	2.48	9.00	6.00	7.00	11.92	15.00
Real GDP growth	0.03	0.03	0.04	-0.06	0.01	0.05	0.11
Real GDP per capita	18.30	39.20	60.32	0.07	9.27	74.31	206.00
Real Interest rates	16.86	8.53	16.28	3.95	11.97	20.10	59.20
Stock market volatility	34.35	16.01	33.33	7.96	23.93	41.15	99.60
Financial integration	0.07	1.41	0.56	-1.77	-1.10	1.23	2.60
Banking crisis	0.06	0.23	0.00	0.00	0.00	0.00	1.00
Private credit to GDP	28.11	13.80	24.18	10.53	19.16	28.79	63.75
<b>Firm Level Variables</b>							
Size (in millions)	929.00	2380.00	12.00	0.41	4.18	63.40	12600.00
Leverage	0.32	0.14	0.32	0.00	0.24	0.42	0.69
Profitability	0.04	0.08	0.03	-0.16	0.01	0.07	0.68
Tangibility	0.57	0.22	0.62	0.01	0.41	0.74	0.93

Panel B: Sample Segmented by Country

	Argentina	Brazil	Chile	Colombia	Czech Republic	Hungary	Mexico	Peru	Poland	Turkey	Venezuela
<b>Loan Variables</b>											
Loan spread	152.20	242.13	81.77	274.50	125.00	48.33	200.75	264.11	90.14	178.13	271.00
Loan maturity	3.67	2.87	4.66	4.80	7.00	7.00	4.02	4.19	3.70	5.00	3.83
Loan size(in \$million)	130.00	161.00	243.00	153.00	24.60	250.00	136.00	147.00	163.00	120.00	179.00
Major currency	1.00	1.00	0.80	1.00	0.00	0.67	1.00	1.00	0.33	0.88	1.00
Bond rating	0.70	0.08	0.44	0.00	0.00	0.00	0.38	0.00	0.61	0.00	0.00
High yield	0.41	0.08	0.00	0.00	0.00	0.00	0.29	0.00	0.17	0.00	0.00
Term Loan	0.89	0.87	0.98	0.90	1.00	0.67	0.85	0.89	0.44	0.88	1.00
<b>Purpose: Corporate financing</b>											
Purpose: Debt repayment	0.44	0.28	0.31	0.30	0.00	0.67	0.34	0.56	0.28	0.25	0.00
Purpose: Acquisition	0.30	0.17	0.24	0.20	0.00	0.00	0.36	0.22	0.28	0.25	0.33
Purpose: Project financing	0.00	0.06	0.13	0.20	0.00	0.00	0.05	0.00	0.00	0.00	0.67
Purpose: Working capital	0.00	0.06	0.00	0.20	0.00	0.33	0.05	0.00	0.28	0.25	0.00
Purpose: Working capital	0.00	0.02	0.02	0.00	1.00	0.00	0.05	0.11	0.06	0.25	0.00
<b>Credit Market Reforms</b>											
Reform index	0.65	0.31	0.81	0.57	0.67	0.72	0.72	0.90	0.65	0.64	0.86
Bank competition	1.00	0.67	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00
Bank supervision	0.33	0.30	0.61	0.33	0.67	1.00	0.39	0.67	0.98	0.92	0.56
Credit allocation	1.00	0.00	1.00	0.33	0.67	0.33	0.97	1.00	0.33	0.67	0.89
Bank privatization	0.33	0.30	0.67	0.63	0.33	0.89	0.82	1.00	0.33	0.25	1.00
<b>Contractual environment</b>											
Institutional quality index	0.60	0.47	0.76	0.37	0.72	0.87	0.52	0.57	0.69	0.59	0.54
Law and Order	0.83	0.36	0.83	0.26	0.83	1.00	0.41	0.50	0.71	0.66	0.64
Corruption	0.40	0.48	0.65	0.36	0.67	0.83	0.45	0.52	0.49	0.41	0.49
Investment Profile	0.57	0.56	0.79	0.49	0.67	0.78	0.71	0.68	0.88	0.69	0.49
<b>Macroeconomic Variables</b>											
Sovereign rating	7.32	0.38	12.97	9.85	13.00	11.56	9.87	7.26	12.89	7.00	7.11
Real GDP growth	0.05	0.02	0.04	0.02	0.04	0.05	0.04	0.02	0.03	0.01	0.01
Real GDP per capita	0.27	1.00	44.40	197.00	2.19	12.30	6.77	0.12	0.74	0.07	42.20
Real Interest rates	7.02	21.64	14.33	14.93	5.13	15.20	17.60	13.09	12.48	44.72	12.86
Stock market volatility	47.46	35.66	27.37	48.62	38.18	42.25	27.34	43.15	29.02	61.47	73.11
Financial integration	1.75	-1.34	-1.18	-1.24	-0.06	-0.02	1.23	2.25	-0.77	-1.10	2.05
Banking crisis	0.19	0.00	0.00	0.10	0.00	0.00	0.08	0.00	0.00	0.25	0.00
Private credit to GDP	21.17	27.83	55.87	18.69	46.16	23.09	19.55	24.67	25.47	15.99	10.88
<b>Firm Level Variables</b>											
Size (in millions)	6.38	7.58	4580.00	5.13	12.30	64.30	26.20	6.15	9.85	5.10	2260.00
Leverage	0.32	0.31	0.36	0.29	0.25	0.17	0.33	0.29	0.27	0.37	0.26
Profitability	0.06	0.03	0.05	0.04	0.04	0.10	0.03	0.06	0.02	0.03	0.02
Tangibility	0.73	0.44	0.72	0.35	0.63	0.50	0.57	0.60	0.62	0.25	0.63

Panel C: Yearly Loan Variables and Change in Reform Variables

Year	Yield Spread (in b.p.)	Loan Issuance (in million \$)	Reform Index	Bank Competition	Bank Supervision	Bank Privatization	Credit Allocation
1994	283.57	108	0.00	0.03	0.00	-0.07	0.03
1995	182.71	124	0.00	0.00	0.07	0.00	0.07
1996	191.76	163	0.04	0.10	0.07	0.20	0.00
1997	133.09	142	0.09	0.00	0.12	0.03	0.06
1998	134.68	216	0.05	0.00	0.09	-0.03	0.00
1999	276.15	144	0.02	0.03	0.00	0.00	0.03
2000	223.72	164	0.02	0.00	0.09	0.03	0.00
2001	176.42	170	0.03	0.00	0.00	0.09	-0.03
2002	177.13	125	0.02	0.00	0.00	0.00	0.00
2003	103.33	256	0.00	0.00	0.00	0.00	0.00
2004	207.38	135	0.00	0.00	0.00	0.17	0.00

**Table 2**  
**Loan Spreads and Credit Market Reforms**

This table reports the impact of credit market reforms index on the natural logarithm of spreads of syndicated bank loans. One year lag of credit market reforms index is used. The first column gives the results with credit market reform index. Columns 2-5 include credit market reforms one at a time, and in column 6 all reforms are included together. Definitions of variables are in Table 1. Number of observations is 262. Year, industry and country effects are included. Country clustered standard errors are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)
	Reform Index	Bank Competition	Bank Supervision	Credit Allocation	Bank Privatization	All Components
Credit market reforms	-3.185** [1.215]					
Bank competition		-1.356** [0.652]				-0.935* [0.486]
Bank supervision			1.504** [0.601]			1.527** [0.527]
Credit allocation				1.425 [1.458]		1.344 [1.563]
Bank privatization					-1.513** [0.523]	-1.357** [0.483]
Sovereign rating	-0.079* [0.040]	-0.109* [0.059]	-0.314** [0.115]	-0.283* [0.151]	-0.199* [0.097]	-0.260** [0.086]
Quality of institutions	0.288 [0.217]	0.298 [0.173]	0.409 [0.367]	0.196 [0.143]	0.167 [0.251]	0.142 [0.245]
Financial integration	-4.345* [2.128]	-3.883 [2.230]	-4.742** [2.094]	-4.676* [2.224]	-5.004** [2.205]	-4.277* [2.151]
Real GDP per capita	3.968 [3.379]	4.154 [3.696]	6.978** [3.082]	5.093 [4.283]	4.612 [3.358]	6.711*** [1.928]
Banking crisis	0.209** [0.093]	-0.161 [0.092]	-0.048 [0.092]	-0.144 [0.095]	0.215** [0.096]	-0.104 [0.089]
Real GDP growth	-6.688* [3.044]	-6.084 [3.458]	-6.660* [3.021]	-8.782 [5.625]	-9.554** [3.781]	-10.827** [4.559]
Real interest rate	-0.026 [0.020]	-0.016 [0.020]	-0.022 [0.015]	-0.018 [0.021]	-0.031 [0.024]	-0.033 [0.019]
Stock market volatility	0.004 [0.005]	0.004 [0.004]	0.01 [0.006]	0.005 [0.005]	0.004 [0.005]	0.009* [0.004]
Loan maturity	0.013 [0.025]	0.01 [0.025]	0.011 [0.025]	0.009 [0.024]	0.013 [0.024]	0.017 [0.028]
Loan size	-0.045 [0.037]	-0.049 [0.038]	-0.068 [0.049]	-0.051 [0.045]	-0.042 [0.039]	-0.045 [0.043]
Major currency	1.569** [0.631]	1.535** [0.665]	1.616* [0.730]	1.519* [0.689]	1.573** [0.642]	1.667** [0.693]
Bond rating	-0.204* [0.127]	-0.266* [0.121]	-0.267** [0.098]	-0.327** [0.107]	-0.224* [0.117]	-0.186* [0.101]
High yield	0.116 [0.085]	0.187** [0.079]	0.169** [0.068]	0.221** [0.082]	0.116 [0.078]	0.098 [0.079]
Term loan	-0.162 [0.136]	-0.167 [0.130]	-0.2 [0.116]	-0.169 [0.136]	-0.163 [0.144]	-0.203 [0.124]
Purpose: Corporate financing	0.335*** [0.100]	0.347** [0.106]	0.362*** [0.105]	0.372** [0.118]	0.345*** [0.099]	0.317*** [0.072]
Purpose: Debt repayment	0.443*** [0.055]	0.489*** [0.066]	0.560*** [0.090]	0.520*** [0.068]	0.444*** [0.046]	0.476*** [0.063]
Purpose: Acquisition	0.569*** [0.161]	0.613*** [0.157]	0.597*** [0.169]	0.683*** [0.170]	0.608*** [0.168]	0.552*** [0.163]
Purpose: Project financing	0.491** [0.209]	0.497* [0.244]	0.513* [0.252]	0.482* [0.252]	0.474** [0.202]	0.493** [0.211]
Purpose: Working capital	0.428** [0.158]	0.464** [0.163]	0.317 [0.182]	0.466** [0.150]	0.410** [0.143]	0.243 [0.151]

**Table 2-continued**

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	(1)	(2)	(3)	(4)	(5)	(6)
	Reform Index	Bank Competition	Bank Supervision	Credit Allocation	Bank Privatization	All Components
Leverage	0.535** [0.182]	0.564** [0.218]	0.604** [0.202]	0.651** [0.256]	0.584** [0.190]	0.528** [0.177]
Size	-0.049* [0.023]	-0.052** [0.023]	-0.052* [0.024]	-0.053** [0.023]	-0.049* [0.023]	-0.050** [0.022]
Profitability	0.277 [0.529]	0.366 [0.551]	0.448 [0.455]	0.257 [0.529]	0.133 [0.500]	0.2 [0.504]
Tangibility	-0.301 [0.281]	-0.259 [0.255]	-0.266 [0.272]	-0.252 [0.261]	-0.301 [0.270]	-0.239 [0.258]
Adjusted R square	0.68	0.67	0.69	0.67	0.68	0.70

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**Table 3****Loan Spreads, Credit Market Reforms and Institutional Environment**

This table reports the impact of credit market reforms on the natural logarithm of spreads in syndicated bank loans in relation to the institutional environment. One year lag of deistic financial reform index is used. The interaction of bank competition, bank supervision, bank privatization and credit allocation with lack of corruption, law and order, investment profile and the quality of institutions are considered. Column 1 gives results for lack of corruption. Column 2 is on the strength of law and order. Column 3 gives the results on investment profile and column 4 is the impact of an index that is composed on the three institutional factors. Year, industry and country effects are included. Country clustered standard errors are in parentheses. Number of observations is 262. Definitions of variables are in Table 1.

	(1)	(2)	(3)	(4)
	Lack of Corruption	Law and Order	Investment Profile	Quality of Institutions
Bank competition	3.237 [2.679]	2.737 [2.857]	-6.653*** [1.444]	-6.267** [3.152]
Bank supervision	0.106 [1.640]	-0.517 [0.860]	6.463*** [1.886]	0.88 [2.434]
Credit allocation	1.05 [1.930]	-2.406 [2.078]	5.721 [4.086]	4.582 [3.743]
Bank privatization	-3.773** [1.288]	-1.247** [.652]	5.164 [4.143]	5.674 [4.678]
Lack of corruption*Bank competition	-5.112** [1.923]			
Lack of corruption*Bank supervision	2.369** [1.172]			
Lack of corruption*Credit allocation	-1.489 [1.891]			
Lack of corruption*Bank privatization	4.234 [2.387]			
Law and order*Bank competition		-6.513** [2.894]		
Law and order*Bank supervision		3.251** [1.669]		
Law and order*Credit allocation		7.455 [6.139]		
Law and order*Bank privatization		-1.677 [2.980]		
Investment profile*Bank competition			11.500*** [2.027]	
Investment profile*Bank supervision			-5.492 [4.547]	
Investment profile*Credit allocation			-0.376 [1.510]	
Investment profile*Bank privatization			-10.519*** [1.336]	
Institutions*Bank competition				10.028 [5.601]
Institutions*Bank supervision				1.484** [0.717]
Institutions*Credit allocation				-2.386 [2.231]
Institutions*Bank privatization				-11.291*** [2.337]

**Table 3-continued**

	(1)	(2)	(3)	(4)
	Lack of Corruption	Law and Order	Investment Profile	Quality of Institutions
Quality of institutions	-1.038 [4.129]	-3.585 [2.555]	-7.473*** [1.880]	-6.469* [3.449]
Sovereign rating	-0.338*** [0.106]	-0.105 [0.107]	-0.280*** [0.085]	-0.261* [0.120]
Financial integration	-0.089 [0.119]	-0.069 [0.111]	0.006 [0.086]	-0.073 [0.096]
Real GDP per capita	3.674 [2.994]	6.180*** [1.289]	8.895*** [2.799]	8.818** [3.087]
Banking crisis	0.254 [0.348]	-0.085 [0.251]	0.650*** [0.142]	0.256 [0.207]
Real GDP growth	-11.533** [4.458]	-12.171*** [3.339]	-17.570*** [3.371]	-11.783*** [3.657]
Real interest rate	-0.034 [0.025]	-0.042 [0.024]	-0.083*** [0.011]	-0.041** [0.013]
Stock market volatility	0.008 [0.005]	0.005 [0.003]	-0.003 [0.005]	0.002 [0.004]
Loan maturity	0.016 [0.022]	0.02 [0.025]	0.019 [0.018]	0.026 [0.026]
Loan size	-0.042 [0.042]	-0.042 [0.050]	-0.042 [0.042]	-0.047 [0.046]
Major currency	1.739** [0.718]	1.779** [0.709]	1.667** [0.600]	1.648** [0.640]
Bond rating	-0.205 [0.148]	-0.129 [0.145]	-0.151 [0.153]	-0.151 [0.176]
High yield	0.177* [0.088]	0.151* [0.070]	0.168* [0.088]	0.162 [0.096]
Term loan	-0.214 [0.124]	-0.247* [0.134]	-0.227* [0.105]	-0.201** [0.067]
Purpose: Corporate financing	0.336*** [0.062]	0.318*** [0.051]	0.380*** [0.066]	0.333*** [0.063]
Purpose: Debt repayment	0.469*** [0.054]	0.459*** [0.045]	0.505*** [0.047]	0.503*** [0.050]
Purpose: Acquisition	0.598*** [0.185]	0.524*** [0.161]	0.614*** [0.182]	0.617*** [0.170]
Purpose: Project financing	0.508*** [0.124]	0.449*** [0.116]	0.507*** [0.116]	0.360** [0.157]
Purpose: Working capital	0.212 [0.145]	0.206 [0.168]	0.246 [0.173]	0.181 [0.151]
Leverage	0.400** [0.134]	0.381*** [0.094]	0.309 [0.171]	0.383*** [0.095]
Size	-0.053** [0.023]	-0.054* [0.026]	-0.050* [0.023]	-0.044* [0.020]
Profitability	0.134 [0.487]	-0.091 [0.487]	-0.391 [0.420]	-0.029 [0.471]
Tangibility	-0.234 [0.272]	-0.144 [0.282]	-0.25 [0.270]	-0.28 [0.258]
Adjusted R-square	0.70	0.72	0.74	0.72

**Table 4**  
**Alternative Specifications**

This table reports alternative specifications. Variable definitions are in Table 1. In the first column, countries with less than 10 observations are not included in the sample. In the second column inflation and M2/GDP are used as additional controls. Column 3 to column 4 report results with Heckman (1979) sample selection correction. The first stage is the issue decision and the second stage is the loan spreads charged by creditors given that corporations issue syndicated bank loans. For the first stage, the lag of private credit to GDP is used as instrument. For the first stage, whole Worldscope sample for the countries with loan issues are considered. In column 3, firm level controls are included and in column 4, they are not included. Year, industry and country effects are included. Country clustered standard errors are in parentheses. Definitions of variables are in Table 1.

	(1)	(2)	(3)	(4)	(5)
	Alternative Sample	Additional Controls	Heckman with Firm Controls	Heckman without Firm Controls - Sample 1	Heckman without Firm Controls - Sample 2
Loan Spreads					
Credit market reforms	-2.916*** [0.537]	-8.740** [3.097]	-3.84** [1.602]	-0.54** [0.212]	-0.505** [0.200]
Sovereign rating	-0.009 [0.254]	0.275 [0.186]	-0.086 [0.316]	0.012 [0.036]	0.008 [0.037]
Quality of institutions	-9.581** [2.199]	2.24 [2.833]	-6.933 [7.254]	-1.816*** [0.631]	-1.700** [0.675]
Financial integration	-0.151 [0.166]	-0.370** [0.128]	-0.081 [0.381]	0.029 [0.046]	0.03 [0.050]
Real GDP per capita	5.093 [5.267]	-5.44 [5.741]	2.92 [7.851]	-1.756 [1.075]	-1.811* [1.057]
Banking crisis	0.593* [0.232]	-2.929*** [0.777]	-0.333 [1.654]	-0.11 [0.117]	-0.104 [0.120]
Real GDP growth	-11.128** [3.437]	-34.600*** [4.339]	-12.636 [15.566]	-1.773 [1.109]	-1.709 [1.157]
Real interest rate	-0.085** [0.022]	-0.029 [0.017]	-0.006 [0.064]	-0.014** [0.007]	-0.015** [0.007]
Stock market volatility	-0.001 [0.009]	-0.019** [0.008]	-0.004 [0.023]	-0.004** [0.002]	-0.005** [0.002]
Loan maturity	-0.022 [0.015]	-0.016 [0.037]	0.015 [0.048]	0.001 [0.008]	0.004 [0.008]
Loan size	-0.015 [0.061]	-0.083 [0.080]	-0.048 [0.100]	-0.138*** [0.020]	-0.142*** [0.021]
Major currency	1.802* [0.699]	1.729** [0.618]	1.572*** [0.431]	0.609*** [0.091]	0.640*** [0.094]
Bond rating	-0.286 [0.161]	-0.071 [0.178]	-0.169 [0.328]	-0.337*** [0.071]	-0.331*** [0.072]
High yield	0.164 [0.103]	0.112 [0.097]	0.099 [0.374]	0.302*** [0.089]	0.271*** [0.093]
Term loan	-0.197 [0.162]	-0.279 [0.171]	-0.139 [0.288]	0.044 [0.059]	0.071 [0.061]
Purpose: Corporate	0.362*** [0.074]	0.449*** [0.086]	0.312 [0.265]	0.137** [0.055]	0.120** [0.057]
Purpose: Debt repayment	0.474*** [0.056]	0.404** [0.121]	0.431 [0.285]	0.242*** [0.062]	0.227*** [0.065]
Purpose: Acquisition	0.475* [0.211]	0.494** [0.156]	0.556 [0.413]	0.612*** [0.098]	0.610*** [0.099]
Purpose: Project	0.688*** [0.122]	1.040*** [0.269]	0.48 [0.464]	0.146* [0.077]	0.127 [0.080]
Purpose: Working capital	0.33 [0.179]	0.329 [0.276]	0.452 [0.484]	0.154 [0.124]	0.162 [0.125]
Leverage	0.777* [0.281]	0.678** [0.283]	-0.617 [2.870]		
Size	-0.052 [0.025]	-0.065* [0.028]	-0.13 [0.205]		
Profitability	-0.111 [0.596]	-0.888 [0.748]	-2.681 [7.236]		
Tangibility	-0.271 [0.322]	-0.05 [0.336]	-1.952 [4.019]		
Inflation		-3.269 [2.157]			
M2/GDP		-0.026* [0.014]			

**Table 4-continued**

	(1)	(2)	(3)	(4)	(5)
	Alternative Sample	Additional Controls	Heckman with Firm Controls	Heckman without Firm Controls - Sample 1	Heckman without Firm Controls - Sample 2
Loan Issuance					
Credit market reforms			1.451** [0.736]	0.654** [0.301]	0.656** [0.306]
Private Credit to GDP			-0.035*** [0.012]	-0.016*** [0.005]	-0.021*** [0.005]
Sovereign rating			0.014 [0.077]	0.014 [0.028]	0.013 [0.029]
Quality of institutions			1.193 [1.029]	0.948** [0.449]	1.093** [0.466]
Financial integration			-0.049 [0.070]	-0.065* [0.034]	-0.082** [0.035]
Real GDP per capita			0.004 [2.096]	1.161 [0.848]	0.876 [0.869]
Banking crisis			0.246 [0.199]	-0.092 [0.094]	-0.095 [0.097]
Real GDP growth			2.785 [1.920]	0.278 [0.893]	-0.052 [0.923]
Real interest rate			-0.008 [0.009]	-0.003* [0.002]	-0.003 [0.002]
Stock market volatility			0.004 [0.003]	0.005*** [0.001]	0.004*** [0.001]
Leverage			0.453*** [0.089]		
Size			0.034** [0.016]		
Profitability			1.189*** [0.265]		
Tangibility			0.663*** [0.165]		
Adjusted R-square	0.71	0.74			
Mill's ratio			-2.92 [6.987]	-0.265** [0.133]	-0.25* [0.180]
Number of observations	262	262	262	1030	262

## Appendix 1 Country Level Statistics

Panel A reports the number of observations for each country in the sample. The first sample is the one with loan characteristics and loan spread. The second sample has firm level variables in addition to loan characteristics. Panel B gives an example of the yearly values of credit market reform variables for Mexico.

Panel A: Number of Observations

	Sample with Loan Spread	Sample with Loan Spread and Firm Characteristics
Argentina	104	27
Brazil	124	53
Chile	133	45
China	2	
Colombia	48	10
Czech Republic	29	1
Egypt	21	
Estonia	6	
Hungary	46	3
Mexico	219	85
Peru	23	9
Poland	80	18
Russia	114	
Turkey	48	8
Venezuela	33	3
Total	1030	262

Panel B: Credit Market Reforms in Mexico

Year	Credit Allocation	Bank Competition	Bank Supervision	Bank Privatization	Banking Reform Index
1994	0.67	0.67	0.00	1.00	0.58
1995	1.00	0.67	0.33	0.67	0.67
1996	1.00	0.67	0.33	0.67	0.67
1997	1.00	0.67	0.33	0.67	0.67
1998	1.00	0.67	0.33	0.67	0.67
1999	1.00	1.00	0.33	0.67	0.75
2000	1.00	1.00	0.33	1.00	0.83
2001	1.00	1.00	0.67	1.00	0.92
2002	1.00	1.00	0.67	1.00	0.92
2003	1.00	1.00	0.67	1.00	0.92
2004	1.00	1.00	0.67	1.00	0.92

## **Appendix 2**

### **Coding Rules Used in the Financial Reform Database**

#### **1. Credit Allocation**

- Mandatory reserve requirements
- Existence of directed credit/existence of priority sector lending
- Existence of directed credit/priority sector lending at subsidized rates
- Existence of aggregate credit ceilings

#### **2. Bank Competition**

- Barriers and restrictions on foreign bank entry
- Restrictions on entry by new domestic banks
- Branching restrictions
- Restrictions on the scope of banking activities (e.g. prohibition for banks to offer non-bank financial services)

#### **3. Banking Supervision**

- Adoption of Basle risk-weighted capital adequacy ratios
- Independence of the central bank/bank regulator from executive's influence
- Exemption of certain financial institutions from supervisory oversight
- Effectiveness of supervision and legal framework to conduct on-site and off-site inspections

#### **4. Bank Privatization**

- Extent of state ownership of banking sector assets

Source: Abiad, Tressel, and Detragiache (2010).

### Appendix 3

#### Alternative Specification for Loan Spreads, Credit Market Reforms and Institutional Environment

This table reports loan spreads, credit market reforms and institutional environment as in Table 3. Instead of using the levels of each institutional variable and indicator is used. The indicator takes a value of one if the value of the institutional variable is above its sample median.

	(1)	(2)	(3)	(4)
	Lack of Corruption	Law and Order	Investment Profile	Quality of Institutions
Bank competition	1.357 [0.882]	1.005 [1.032]	-1.991** [0.818]	-2.314** [0.899]
Bank supervision	-0.153 [0.396]	0.909 [0.578]	2.360** [0.833]	0.225 [0.837]
Credit allocation	2.956 [1.695]	-0.832 [2.044]	3.601 [3.493]	5.198 [4.619]
Bank privatization	-1.357** [0.663]	-3.300** [1.078]	-0.079 [0.621]	1.168 [1.510]
Lack of corruption*Bank competition	-4.359** [1.542]			
Lack of corruption*Bank supervision	2.828*** [0.780]			
Lack of corruption*Credit allocation	3.653 [2.192]			
Lack of corruption*Bank privatization	-1.378 [1.325]			
Law and order*Bank competition		-11.786** [5.203]		
Law and order*Bank supervision		2.363** [1.078]		
Law and order*Credit allocation		9.054 [7.674]		
Law and order*Bank privatization		0.318 [1.633]		
Investment profile*Bank competition			1.864 [1.634]	
Investment profile*Bank supervision			-0.379 [1.003]	
Investment profile*Credit allocation			-0.189 [0.344]	
Investment profile*Bank privatization			-2.187*** [0.551]	
Institutions*Bank competition				-1.777 [1.377]
Institutions*Bank supervision				1.946** [0.818]
Institutions*Credit allocation				4.153 [3.093]
Institutions*Bank privatization				-5.177*** [0.742]

### Appendix 3 - continued

	(1)	(2)	(3)	(4)
	Lack of Corruption	Law and Order	Investment Profile	Quality of Institutions
Quality of institutions	-0.854 [2.490]	-3.303 [1.839]	-5.968** [2.650]	-3.611* [1.684]
Sovereign rating	-0.281** [0.099]	-0.259** [0.114]	-0.395*** [0.089]	-0.241* [0.120]
Financial integration	0.005 [0.095]	-0.139 [0.094]	-0.028 [0.117]	-0.11 [0.102]
Real GDP per capita	2.68 [1.779]	2.317 [1.846]	10.632*** [2.820]	6.121*** [1.727]
Banking crisis	-0.13 [0.178]	-0.831** [0.326]	0.25 [0.194]	-0.500** [0.218]
Real GDP growth	-11.886** [4.065]	-19.332*** [5.540]	-13.249*** [4.058]	-20.739*** [3.607]
Real interest rate	-0.019 [0.014]	-0.071** [0.030]	-0.032 [0.021]	-0.091*** [0.011]
Stock market volatility	0.003 [0.006]	0.006** [0.002]	0.002 [0.004]	0 [0.003]
Loan maturity	0.012 [0.023]	0.027 [0.024]	0.028 [0.028]	0.02 [0.024]
Loan size	-0.04 [0.043]	-0.039 [0.045]	-0.042 [0.042]	-0.035 [0.047]
Major currency	1.734** [0.701]	1.753** [0.707]	1.778** [0.674]	1.661** [0.637]
Bond rating	-0.048 [0.133]	-0.176 [0.156]	-0.092 [0.134]	-0.123 [0.153]
High yield	-0.007 [0.080]	0.237** [0.086]	0.08 [0.071]	0.144 [0.082]
Term loan	-0.136 [0.112]	-0.279** [0.117]	-0.193 [0.113]	-0.224** [0.094]
Purpose: Corporate financing	0.317*** [0.045]	0.300*** [0.049]	0.306*** [0.047]	0.340*** [0.046]
Purpose: Debt repayment	0.467*** [0.059]	0.493*** [0.056]	0.473*** [0.061]	0.501*** [0.052]
Purpose: Acquisition	0.590*** [0.169]	0.501** [0.159]	0.611*** [0.160]	0.544*** [0.158]
Purpose: Project financing	0.507*** [0.133]	0.469** [0.149]	0.442** [0.169]	0.444*** [0.130]
Purpose: Working capital	0.265* [0.144]	0.236 [0.186]	0.244 [0.177]	0.235 [0.177]
Leverage	0.401*** [0.112]	0.350*** [0.104]	0.278 [0.154]	0.337** [0.133]
Size	-0.052** [0.023]	-0.046* [0.021]	-0.048* [0.024]	-0.050* [0.023]
Profitability	0.091 [0.399]	-0.313 [0.510]	-0.082 [0.594]	-0.282 [0.411]
Tangibility	-0.247 [0.239]	-0.09 [0.245]	-0.246 [0.270]	-0.153 [0.280]
Adjusted R-square	0.72	0.73	0.71	0.74