

Credit Market Reforms and Corporate Debt Policy: International Evidence^{*}

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Abstract

We study how the deregulation of the domestic banking sector affects corporate debt policy. If deregulation lowers the cost of credit and increasing its availability, as intended, firms should use more debt in their capital structure following deregulation. We test this hypothesis with a large panel of publicly traded non-financial firms using a new index that carefully tracks policies to deregulate domestic credit markets. After controlling for other factors, we find that reforms seem to be associated with a reduction, rather than an increase, in corporate debt in emerging market firms. This negative effect is attenuated in countries with better institutions, and it disappears in advanced countries. Furthermore, we do not find evidence of a differential effect of reforms on financially constrained firms, financially dependent firms and firms with no access to global markets.

Keywords: Corporate leverage, financial liberalization, credit constraints

JEL classification: G15, G20, G32

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I. INTRODUCTION

In the past decade, the banking sector has undergone large transformations in many countries around the world. One of the factors behind these changes has been the pursuit of financial liberalization policies, encompassing deregulation of interest rates, entry liberalization, bank privatization, reforms to financial sector supervision and regulation, and other measures. These policies aimed at reducing the cost of credit and broadening its availability by increasing the scope for market forces to operate in credit markets, and correspondingly reducing government intervention.

Financial liberalization policies were first advocated by McKinnon and Shaw in the 1970s (McKinnon, 1973; Shaw, 1973) especially for developing countries, where state intervention in the financial sector was especially heavy handed. As financial liberalization began to be implemented in the late 1980s and early 1990s, however, evidence emerged that in some circumstances it could lead to undesirable outcomes, such as high and volatile interest rates and macroeconomic and financial sector instability. These drawbacks were attributed to various factors, such as a mismanaged or premature liberalization process, inadequate bank prudential regulation and supervision, or weak institutions to protect property and contractual rights.¹

¹ In an early study, Diaz Alejandro (1985) describes how mismanaged financial liberalization led to a deep financial crisis in Chile in the early 1980s. Haber and Musacchio (2005) claim that Mexico's financial crisis in 1994-95 was the result of failed bank privatization. Financial liberalization has been associated to a higher incidence of banking crises (Demirgüç-Kunt and Detragiache, 1999) and more output volatility (Kaminsky and Schmukler, 2003). Detragiache, Tressel, and Gupta (2009) argue that foreign bank entry can lead to a reduction in credit to the private sector in poor countries, and Tressel and Detragiache (2008) find that liberalization spurs long-lasting credit market development only in countries with good property rights. Studies of deregulation in advanced countries generally find positive effects, see for example Jayaratne and Strahan (1996), Stiroh and Strahan (2003), Cetorelli and Strahan (2006), Bertrand, Schoar, and Thesmar (2007), Guiso, Sapienza, and Zingales (2006). Also, Galindo, Schiantarelli, and Weiss (2005) find that financial liberalization improves the allocation of investment in developing countries.

In this paper we explore how credit market deregulation has affected borrowing decisions at the corporate level. We conjecture that, if reforms met their objective of fostering credit market development, other things being equal, firms will use more debt in their capital structure following deregulation policies, because firms would find it easier and cheaper to finance themselves through debt. On the other hand, if the main result of reforms has been to increase macroeconomic and financial instability, ultimately undermining the smooth functioning of credit markets, then we might find no significant effect or even a negative effect of reforms on corporate leverage, as macroeconomic instability may increase the bankruptcy costs associated with debt financing. Also, mismanaged liberalization may result in widespread bank closures, or in increased monopoly power in the credit market, disrupting the supply of bank credit and increasing its cost, causing corporations to cut back on debt financing.

We explore these issues with a large panel of non-financial firms in 36 countries during the period 1995-2002. Deregulation is measured with a new index tracking actual policy changes constructed by Abiad, Detragiache and Tressel (2009). We regress a standard measure of leverage on a set of firm-level characteristics suggested by corporate finance theory, country-level control variables, and firm and time fixed effects.² Interestingly, we find that in this sample, credit market reforms do not result in higher corporate debt. To the contrary, in emerging markets, domestic financial reforms are associated with *reduced* corporate leverage, suggesting that the reduction in funding costs and the increase in availability of credit that banking reforms

² Although our focus is on domestic credit market reforms, a useful by-product of our analysis is detailed international evidence on the overall determinants of corporate leverage which, as stressed by Myers (2003), may be useful in further refining theories of leverage.

that were intended to foster did not materialize in these countries.³ Among the various credit market reforms, policies to reduce mandatory reserve requirements and eliminate preferential credit allocation schemes and quantitative credit restrictions are the policies more clearly associated with a reduction in leverage.

When we examine the impact of institutions on our findings, we find that lack of corruption, low country risk and improved information availability through credit registries reduce the negative effect of financial reforms on firm leverage. Thus, financial reforms seem to result in more access to credit by corporations only where the overall institutional quality is sufficiently high.

Though we fail to find the expected results on average, it might be that reforms improve access to credit only for some groups of firms. To explore this possibility, we test whether credit market reforms led to a disproportionate increase in leverage in firms in sectors more dependent on external finance, in firms more financially constrained, and in firms with no access to international capital markets. Again, we fail to find any differential effect of reforms on the leverage of these groups of firms. This is further evidence that reforms did not work as expected.

The remainder of the paper is composed of six sections. Section 2 briefly reviews the related literature. Section 3 discusses the various credit market reforms tracked in our database and explains through which channels we expect these reforms to affect corporate leverage. Section 4 lays out our empirical model. Section 5 provides an overview of the data. Section 6 contains the results, and Section 7 concludes.

³ In the regressions, we control for changes in the cost of equity through a variable measuring the liquidity of the stock market. Thus, the observed reductions in leverage following reforms should not be attributable to a reduction in the cost of issuing equity.

II. LITERATURE REVIEW

Most empirical research on the corporate financial structure has focused on U.S. data. Among international studies, Rajan and Zingales (1995) found that most firm characteristics that explain leverage in the U.S. have a similar explanatory power in other advanced economies. Booth, Aivazian, Demirgüç-Kunt, and Maksimovic (2001) reports a similar finding for developing country firms, but also show that country characteristics (captured by country fixed effects) account for a substantial fraction of the sample variation. Fan, Titman, and Twite (2006) confirms these findings in a broad sample of firms from 39 countries during the 1990s. This paper also finds that leverage is higher in countries with more corruption and a deeper banking system, and lower in countries with a legal system based on common law. Because the latter variable is indistinguishable from possible omitted time-invariant country characteristics, however, this finding needs to be interpreted with caution. In our regressions we include firm (and hence country) fixed effects.⁴

Similar to our paper, Schmukler and Vesperoni (2006) studies the impact of financial reforms on leverage by examining seven emerging markets during the period 1980-1998, and considers three types of reforms, each measured by a zero-one dummy variable: the first is the liberalization of foreign entry into the local stock market (Bekaert and Harvey, 2000); the second is the liberalization of the domestic financial sector; and the third is the liberalization of controls on foreign capital flows (Kaminsky and Schmukler, 2003). The paper concludes that the effects

⁴ Firm fixed effects control for time-invariant firm characteristics that influence the leverage decision, such as industry. Lemmon, Roberts and Zender (2008) show that in the U.S. time-invariant firm characteristics explain most of the total variation in leverage. In contrast to many studies in the literature, we do not attempt to explain the cross-sectional variation in leverage, but only focus on the time-series variation. This is consistent with our focus on the effects of credit market reforms on firm borrowing decisions. Time dummy variables and other macroeconomic variables allows us to control for country-level and worldwide macroeconomic conditions, as well as country characteristics that may influence the leverage decision

of financial liberalization are asymmetric in emerging markets, since firms that are not able to integrate in world capital markets appear unable to obtain long-maturity debt.⁵

We should note three limitations of the Schmukler and Vesperoni's study. First, the sample consists of only seven emerging markets. Second, country-specific macroeconomic developments and global trends are not controlled for, so the liberalization dummies may act as proxies for these omitted variables. Third, one of the liberalization measures, opening the stock market to foreign investors, should lower the cost of issuing equity relative to debt, and can therefore reduce leverage. In our analysis, we considerably extend the set of countries including advanced as well as emerging economies; we carefully control for global trends and for changes in the macroeconomic environment, and utilize comprehensive measures of financial reforms that capture the deregulation of credit markets and not that of equity markets. Also, most of the countries in our sample have liberalized stock markets during the sample period and thus results are not confounded by the opposite effects of stock market reforms will have on corporate debt policy.

III. CREDIT MARKET REFORM AND CORPORATE DEBT POLICY

To capture the financial liberalization process, we rely on the index of Abiad, Detragiache, and Tressel (2009). This index tracks reforms in several broad areas: deregulation of bank interest rates (both lending and deposit rates); reduction in mandatory reserve requirements and in administrative constraints on credit allocation; deregulation of bank entry;

⁵ The main findings of Schmuckler and Vesperoni (2006) are that (i) domestic liberalization does not have a significant impact on the leverage (and debt maturity) of firms that actively access global markets; (ii) domestic liberalization leads to lower leverage (and shorter debt maturity) in firms that do not access global markets; (iii) foreign capital flows liberalization has no significant effect.

relaxation of restrictions on branching and on the scope of bank activity; liberalization of foreign bank entry; bank privatization; and reforms to strengthen bank regulation and supervision.⁶

Several considerations suggest that reforms aimed at reducing the role of the government in the provision of credit should result in an upward shift in the supply of credit to the private sector — while having no similar effects on the supply of equity financing. When both deposit and lending interest rates are kept low by binding ceilings, in equilibrium, bank deposits are small, loan supply is equally low, and credit is rationed. Lifting both deposit and lending rate ceilings results in an increase in deposits and bank lending. Another reform typical of the financial liberalization process is the reduction in (less than fully remunerated) reserve requirements. This policy works as a cut in a proportional tax on bank deposits, and hence should result in a decline in intermediation spreads and an increase in lending. Credit market deregulation often includes the elimination of mandatory directed credit program forcing banks to allocate part of their loan portfolio to unprofitable sectors at subsidized interest rates. Under these programs, often banks cover the cost of the subsidy by charging higher spreads to non-preferential sectors. Thus, the elimination of directed credit programs should decrease spreads and increase credit supply to non-preferential sectors.

Financial liberalization policies also entail lifting restrictions on entry into the banking sector, including restrictions on foreign bank entry. This policy aims at fostering competition, leading to gains in cost efficiency and lower intermediation spreads, thus lowering the cost of credit for corporations (and other borrowers). Efficiency gains should also come from bank privatization should, as private banks operate to maximize profits rather than pursuing other

⁶ See Appendix 3 for more details on the construction of the reform index. Additional information is provided in Abiad, Detragiache, and Tressel (2009).

objectives and are subject to the discipline of competition. Finally, measures to upgrade financial regulation and supervision, while they may impose some additional administrative costs on banks, should improve the stability of the banking system as a whole, ultimately making the supply of credit more stable and reliable. Thus, we would also expect improvements in supervision and regulation to increase corporate reliance on debt financing.

As deregulation leads banks to increase loan supply, other things being equal we expect corporations to respond by increasing the amount of debt in their capital structure. We test this proposition in the rest of the paper.

IV. METHODOLOGY

A. The empirical model

We estimate versions of the following regression model:

$$LEV_{ict} = \alpha_i + \alpha_t Dev_c + X_{ict-1}\beta_{11} + Z_{ct-1}\beta_{12} + DFINLIB_{ct-1}\gamma_1 + \varepsilon_{ict}$$

where LEV_{ict} is the Cox transformation of the leverage ratio in firm i in country c and year t .⁷

The terms α_i and α_t denote firm and time fixed effects respectively. Dev_c denotes a vector of dummies for emerging and advanced economies. The firm dummies control for time-invariant firm characteristics, while the time dummies control for worldwide developments, both long-term and cyclical, as well as for events that affected world financial markets, such as the Asian

⁷ The Cox transformation of a variable x is $\ln(x/(1-x))$. We use this transformation because the leverage ratio is bounded between 0 and 1, and hence cannot be normally distributed. Replicating the regression using untransformed data does not change the results.

and Russian crises. Since these shocks may affect emerging markets and advanced economies differently, we allow for separate time dummies for the two set of countries.⁸

The terms X_{ict-1} and Z_{ct-1} denote lagged vectors of firm-level and country-level control variables respectively, $DFINLIB_{ct-1}$ is the lagged domestic financial reforms index or a vector with the five components of the index. Using lagged variables is consistent with the idea that firms' debt financing decisions in any given period are made conditional on values of all variables at the beginning of that period.⁹ In an alternative specification, we interact the credit markets reforms index with emerging and advanced dummy variables to study whether the effects of deregulation differ across groups of countries. In additional tests, we also interact credit market reforms with country characteristics such as country risk, creditor rights, lack of corruption, and existence of credit registries or credit bureaus to examine whether differences in these institutional features lead to a differential impact of reforms on leverage. We also estimate a specification in which the domestic financial reforms index is replaced by its components that are entered separately. This allows us to detect possibly differential effects of each dimension of domestic financial reforms on leverage.

We estimate the model using OLS with standard errors clustered by country. Petersen (2007) shows that OLS with clustering can effectively correct for correlation across time in the residuals, a feature of corporate capital structure panel data. In addition, according to Cameron,

⁸ The main results are robust to using a unique set of fixed effects for all countries.

⁹ This specification also allows us to alleviate the simultaneity problems that may exist when the dependent variables are specified contemporaneously.

Gelbach and Miller (2006), with multi-way panels such as ours it is appropriate to cluster at the higher level of aggregation, which in our case is the country level.¹⁰

B. Firm level controls

The vector of firm level variables includes firm size, growth opportunities, profitability and tangibility, as in Rajan and Zingales (1995).¹¹ In addition, we include dummy variables indicating whether a firm has either a bond rating from Moody's or it has issued ADRs in a given year, since the leverage of rated firms or firms with access to international capital markets may be very different from that of firms without these characteristics.¹² Consistent with the corporate finance literature, growth opportunities are measured by Tobin's Q, firm size by the natural logarithm of end-period total assets, profitability by the ratio of earnings before interest and taxes (EBIT) to total assets, and asset tangibility by the ratio of net plant, property and equipment (NPPE) to total assets.¹³ Summary statistics for all the variables are in Table 1.

¹⁰ Clustering at the firm level does not change the results.

¹¹ We are unable to account for taxation and its role in determining debt financing decisions due to data unavailability.

¹² We identify firms that have issued ADRs and have bond ratings for each firm-year, and constructed relevant dummies. In our sample, there are 3060 firm-year observations with ADRs and 6808 firm-year observations with a bond rating from Moody's. Data on ADRs are from Datastream. We utilize Mergent Online to identify firms with a bond rating in any given year.

¹³ Tobin's Q is calculated as the sum of year-end market capitalization (year-end market price multiplied by common shares outstanding) (Worldscope item 08001) and total debt, divided by total assets. EBIT is Worldscope item 18191, while net plant, property and equipment (NPPE) is Worldscope item 02501.

C. Country-level controls

Country-specific characteristics are controlled by a set of macroeconomic variables and other proxies of credit market and institutional characteristics. Including in the regression a set of country-level controls is especially important because reforms may occur more frequently when other events happen, which in turn may affect corporate debt policies. This classic omitted variable problem may bias the coefficient that we are interested in. For example, reforms may tend to accelerate in the aftermath of banking crises, and crisis may also trigger corporate deleveraging. Failing to control for the occurrence of banking crises may result in a spurious negative correlation between reforms and leverage. To avoid this problem, we control for the occurrence of a banking crisis through a dummy variable which takes the value of one for the year following the onset of a banking crisis.¹⁴

Another important control variable is stock market turnover, which proxies the cost of equity finance. If credit market reforms tend to coincide with periods of stock market development, then it might be that the cost of both debt and equity financing falls, and the effect on leverage is ambiguous. We do not include stock market liberalization as an additional variable as almost all countries in our sample liberalized their stock markets by 1994.

To capture changes in the quality of the institutional environment, we use the level of country's development (measured by the natural logarithm of gross domestic product per capita at purchasing power parity from the World Bank's World Development Index database), the International Country Risk Guide (ICRG) composite index for country risk, and the index of lack of corruption from *Transparency International*. Changes in banking market structure may also

¹⁴ We take banking crises dates from Cambell Harvey's country risk chronology, which is available at www.duke.edu/~charvey/Country_risk/chronology.

affect the supply of credit, so we control for the three-bank concentration ratio, defined as the share of the three largest banks in total bank assets, from the World Bank Financial Structure Database. Other institutional characteristics that may affect the supply of credit are the degree to which creditor rights are protected in bankruptcy (Djankov, McLiesh, and Shleifer, 2007), and the presence of credit registries or credit bureaus that facilitate information sharing among financial intermediaries. Accordingly, we include the creditor rights index and a dummy variable for the presence of either a credit bureau or a credit registry as additional controls in the regressions.¹⁵ Cross-country differences in the macroeconomic environment are accounted for by GDP growth and its volatility, the annual inflation rate, and the risk-free real interest rate.¹⁶

Finally, we control for policies that improve firm access to credit from non-residents using on a new index by Schindler (2009). This index is constructed using IMF data on administrative restrictions on balance of payment financial flows and distinguishes restrictions on different type of flows (direct foreign investment, portfolio equity, long-term debt flows, money market flows), as well as restrictions on the directions of flows (i.e. domestic borrowing from non-residents or foreign resident purchase of domestic equity as opposed to non-resident borrowing from domestic residents or domestic resident purchase of foreign equity). Since we are interested in barriers to debt-type inflows only, we include in the index restrictions on the three debt-type inflows in the Schindler dataset: bonds, money market instruments, and financial credits flows. For each of these categories, the presence of significant restrictions is coded as one

¹⁵ The creditor rights index combines four dimensions of creditor rights over the period 1978-2003. These dimensions are restrictions on reorganization, the existence of automatic stay or asset freeze, priority of payment for secured creditors, and management of the firm during reorganization. The index varies between 0 and 4. The higher is the score, the stronger are the creditor rights.

¹⁶ GDP growth volatility is measured as the standard deviation of the variable over five years. Also, introducing a dummy variable for countries with very high inflation does not change the results.

and the absence of restrictions is coded as zero. Our measure of liberalization is computed as one minus the sum of the three dummies divided by three. This index varies from zero to one and is higher the more liberalized are debt-type inflows.

V. DATA OVERVIEW

The data set is composed of accounting and market data for a large sample of publicly traded firms (excluding financial firms and utilities) and of macroeconomic and institutional variables for 22 advanced and 14 emerging market countries over the period 1995-2002.¹⁷

Overall, the baseline sample includes 13,457 firms and 57,158 firm-year observations. The sample is unbalanced, as firms are progressively added to the Worldscope dataset. Also, firms in advanced economies are overrepresented (see Appendix 1).

A. Corporate leverage across countries and time

Firm leverage is measured as the ratio of total debt to total assets.¹⁸ As shown in Figure 1A, emerging market firms have a higher mean leverage than advanced country firms throughout the sample period. In both groups of countries, leverage increases at the beginning of the sample

¹⁷ We exclude financial firms (2-digit SIC code 60 to 69) and utilities (2-digit SIC code 40 to 49), and require each firm to have at least two years of data. To remove outliers, we winsorize all firm level variables at the 0.5 and 99.5 percentiles. Advanced economies are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, United Kingdom and United States. Emerging market countries are: Argentina, Brazil, Chile, China, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Thailand, and Turkey. We categorize these countries as advanced and emerging markets according to the World Economic Outlook classification (IMF, 2006). We omit a country for a given year if that country does not have at least 10 firms for that year.

¹⁸ Leverage is total debt (Worldscope item 03255) divided by total assets (Worldscope item 02999). In robustness checks, we measure leverage as total debt divided by equity. The results are mainly comparable.

period and then declines. In emerging markets, the peak is in 1997, when the Asian financial crisis broke out. In advanced countries, the peak is 1999, before the “dot-com” bubble burst. In our regressions, common trends are picked up by the dummy variables, so they do not enter the variation that we are trying to explain. Nonetheless, the pattern in Figure 1A suggests that it may be important to allow for separate common trends for advanced and emerging countries, as different global shocks affected these two groups of countries differently. We follow this approach in the regressions.

B. The domestic financial reforms index

To track reforms aimed at developing domestic credit markets, we rely on the database of financial reforms of Abiad, Detragiache and Tressel (2009). This database tracks several dimensions of financial sector reform. The overall index of financial reform is an average of subindexes tracking five separate subcategories. For each subcategory, higher scores indicate a less regulated credit market.

The first subindex is called *credit allocation*, and it tracks four aspects of credit market regulation: the extent of mandatory bank reserve requirements, which are often unremunerated and act as a tax on bank deposits; government policies that force banks to lend at subsidized interest rates to preferential sectors; and quantitative restrictions on aggregate bank credit growth (used in some countries to curb the growth of monetary aggregates). The second subindex, *interest rate controls*, varies based on the extent to which deposit or lending bank interest rates are market determined rather than subject to administrative ceilings. The *entry barriers* dimension tracks restrictions on entry into the banking sector (including restrictions on foreign bank entry), as well as reforms that relax restrictions on branching and scope of bank activities.

The *bank privatization* subindex varies based on the extent to which bank assets are private as opposed to government-owned. Finally, the *bank supervision* subindex is coded based on whether the country has adopted the Basel I capital regulation agreement, as well as the degree of independence of supervisory agency, the effectiveness of on-site and off-site examinations of banks by supervisory agency, and the perimeter of bank prudential regulation and supervision.

In the regressions, we use both indexes for the individual subcategories and the index that combines all five dimensions (credit market reforms (CMR) index, henceforth). The range of each index is between zero and one. More details on the coding rules are in Appendix 3.

In the sample, there are six advanced countries (Canada, Denmark, Finland, Germany, New Zealand and Sweden) where there is no change in any dimension of the CMR index during the sample period. In two dimensions (credit allocation and interest rate controls) the main variation is in emerging markets. For over 20 percent of the country-year observation there is a change in the index, suggesting that the sample period was characterized by significant reform activity.

As shown in Figure 1B, not surprisingly advanced economies have higher scores than emerging market countries in all dimensions of the CMR index. Moreover, this index has a general upward trend that flattens after 2000.¹⁹

¹⁹ Pair-wise correlations among the subcomponents of the index are in Appendix 2.

VI. THE RESULTS

A. Baseline specification

Regression results are presented in Table 2. The coefficients of the firm-level determinants of leverage are consistent with the existing literature: leverage is positively and significantly related to firm size, tangibility, and the existence of a bond rating. This result indicates that larger firms with more tangible assets and a bond rating are more levered, likely because they are able to borrow at more favorable terms. On the other hand, leverage is negatively and significantly related to growth opportunities as predicted by the underinvestment theory proposed by Myers (1977), and to profitability, consistent with previous empirical findings.²⁰

Among the country-level variables, as expected higher stock market liquidity is negatively associated with leverage, as it indicates a lower cost of equity financing higher. GDP per capita and lack of corruption are associated with higher leverage, while a higher score for the ICRG index is associated, somewhat surprisingly, with lower leverage. Stronger creditor rights in bankruptcy lead to more leverage, as these rights presumably relax credit constraints due to limited enforceability, consistent with the findings of Djankov, McLiesh, and Shleifer (2007).

Turning to the index of credit market reforms, the coefficient of this index is negative but not statistically significant, indicating that reforms did not result in an increase in corporate leverage. This suggests that reforms may not have succeeded in expanding the supply of bank credit to corporations.

²⁰ Alternative theories have opposite predictions about the leverage-profitability relationship. According to the pecking order theory, the relationship should be negative as firms prefer to use internal finance when available. According to the trade-off theory, the sign should be positive, as more profitable firms can benefit more from the tax advantages of debt. Our results are consistent with the pecking order theory.

B. Country heterogeneity

Panel regression impose the restriction that the slope coefficients be the same for all units. In our case, it is possible that the effect of reforms is different based on country characteristics. For example, in a country with well developed institutions to enforce private contract and low levels of corruption, credit market reforms may be more successful. This would imply that slope coefficients may differ based on country characteristics.

We explore this possibility in the regressions of Table 3, where we allow for separate effects of reforms in advanced and emerging market countries. Interestingly, in advanced economies the effect of credit market reforms on leverage is positive but not statistically significant, while in emerging markets firms significantly *reduce* leverage following reforms. Thus, somewhat surprisingly, in emerging market countries, domestic credit market deregulation appears to make debt financing less attractive to corporations. Concerning the economic significance of the results, a one standard deviation increase in the reform index decreases leverage by close to 10 percentage points in emerging market countries, a substantial effect.²¹

Based on this evidence, it appears that the relative strength of demand and supply shifts induced by credit market reforms critically depends on country characteristics. This may reflect cross-country differences in the intensity of information asymmetries and the cost of financial contracting, as stressed by Diamond (2004) and Stulz (2005), which in turn may reflect differences in basic institutions that shape the contracting environment. We explore this issue further in the next section.

²¹ Because of the Cox transformation, the effect of a change in reforms on leverage is not linear. Following standard practice, we report slopes calculated at the sample mean of leverage.

C. What is different in emerging markets?

In this section, we try to shed some additional light on which country characteristics may be behind the heterogeneous effect of domestic financial reforms on corporate leverage. To this end, instead of allowing for a separate coefficient for advanced and emerging markets, we interact credit markets reform index with four alternative country characteristics: two broad measures of institutional quality (lack of corruption and the ICRG composite index), and two characteristics of the contractual environment (creditor rights and creditor information).

The results are in Table 4.²² The interaction between domestic reforms and the index of lack of corruption is positive and significant, and the non-interacted term is negative and significant. Thus, domestic financial reforms lower leverage, but this negative effect peters out as the country becomes less corrupt. In fact, at the sample mean of corruption the effect of credit market reforms on leverage is positive. When we use the ICRG country risk index to measure institutional quality, we find similar results in the sense that the effect of reforms on leverage is negative at high levels of country risk, but it becomes positive as country risk is reduced. Thus, financial reforms seems to result in more access to credit by corporations only where the overall institutional quality is sufficiently high. This may be because financial deregulation policies do not work when widespread corruption and poor institutions impair the basic mechanism to enforce contracts and allocate financial resources.

When we interact the reform index with specific indicators of the contractual environment, namely creditor rights and creditor information, we find evidence of a differential

²² To conserve space, we do not report firm level and country level control variables. The coefficients of these variables are comparable to those reported earlier and are available from authors upon request.

response of leverage to reforms in countries with credit registries or credit bureaus relative to other countries, suggesting possible complementarities between reforms to liberalize credit markets and improvements in information sharing among creditors. On the other hand, we find no differential effects among countries with different strength of creditor rights.²³

D. Disentangling the effects of different reforms

In this section, we rerun the baseline regression after breaking down the domestic financial reforms index into its components to explore whether the different aspects of financial deregulation have a distinct impact on leverage. Since the effects of reforms appear to be different in advanced and emerging markets, we allow for separate coefficients for the two country groups, as in the regressions of Table 3. In interpreting the results, it is important to keep in mind that for one of the components (interest rate controls) there is no sample variation in advanced countries, and for another component (credit allocation) the variation is quite limited. In addition, the components of the index are strongly correlated within each country, which makes it difficult to disentangle the specific role of each category of reforms.

Regression results are in Table 5. While coefficients are generally insignificant, possibly reflecting multicollinearity, in emerging markets the credit allocation subindex is significantly negative. Thus, it appears that measures to liberalize deposit and lending rates, reduce reserve requirements, and eliminate preferential credit allocation schemes and quantitative credit

²³ We also tested whether the effects of credit market reform differed in countries with different stock market liquidity. The conjecture is that where equity financing is easy credit market reforms may have little or no impact, and vice versa. We do not find any differential effects, however.

restrictions increased the cost or reduced the availability of debt finance for corporations in emerging markets, resulting in lower leverage.

E. Robustness tests

To test the robustness of our results, we rerun the baseline regression using the ratio of debt to equity to measure of leverage. This reduces the sample to 37,837 observations and 10,810 firms. As shown in Table 6, the main results on the effect of financial reforms on leverage continue to hold, and the effects of the other firm-level and country-level covariates do not change much.

We also re-estimate the regressions using a dynamic panel estimator, the Arellano and Bond (1991) estimator. This estimator allows us to introduce a lagged dependent variable in the model, and can correct for possible endogeneity of the regressors, particularly the reform index. Our main result, that there is a negative relationship between domestic financial reforms and corporate leverage in emerging markets continues to hold in the GMM regression. Interestingly, in the dynamic model the positive coefficient of the reform index for advanced country firms is statistically significant, suggesting that in advanced country reforms may have worked as expected. Also, in the dynamic model the relationship between leverage and some of the firm-level variables changes quite markedly: once we condition on past leverage, lower profits, more tangible capital, and a bond rating seem to be associated with lower leverage rather than higher leverage.

F. Do reforms affect different groups of firms differently?

So far, we have considered the possibility that the effects of credit market reforms may be different in different groups of countries. However, it is also possible that the effects we try to

identify differ among different categories of firms. For example, it could be that larger, well established firms with a lot of tangible assets and a stable business can obtain credit at relatively favorable rates even when credit markets are heavily repressed, so that financial reforms have little impact on their ability to borrow. On the other hand, firms are more reliant on external funding or have difficulty in tapping foreign markets may be the main beneficiaries of deregulation. To examine this issue, we consider three alternative forms of firm heterogeneity: the degree of financial dependence in the sense of Rajan and Zingales (1998); whether the firm is likely to be financially constrained, i.e. unable to raise external finance; and whether the firm has access to global capital markets.

Rajan and Zingales (1998) argues that firms in certain industries rely more heavily on external finance because of the technological characteristics of their production process. Furthermore, this study shows that financial development disproportionately benefits firms in financially dependent industries. Dell’Ariccia, Detragiache, and Rajan (2008) also shows that financially dependent sectors suffer disproportionately during banking crises, when the supply of bank credit is disrupted. In light of this research, it is interesting to examine whether corporate leverage responds to credit market reforms in financially dependent sectors. Thus, we rerun the baseline regression adding an additional interaction term with a dummy for whether the firm in a sector with an above-median value of the Rajan-Zingales index of financial dependence.²⁴ As before, we continue to allow for differential effects in advanced and emerging countries. The

²⁴ We define an industry’s degree of financial dependence as the percentage of capital expenditure not covered by operating income, as in Rajan and Zingales (1998). We compute this measure using COMPUSTAT data from 1990 to 2002. We rank industries according to financial dependence, and treat industries with values above the median as financially dependent industries. Median financial dependence in our sample is -1.237.

results are in Table 7. While the coefficients of the interaction terms are positive as expected, they are not different from zero.

We also consider whether the impact of credit market reforms on corporate debt may be stronger for firms that are more likely to face financial constraints. Other things being equal, if domestic financial reforms increase the availability of credit, we should find that the impact is stronger on constrained firms. Following Korajczyk and Levy (2003), we define a firm in a given country in a given year as constrained if it is not paying dividend and its Tobin's q is either greater than one or greater than the median for that country, resulting in 22 percent of our sample observations being classified as constrained.²⁵ As shown in Table 7, the coefficient of reforms in emerging markets interacted with the dummy for the presence of financial constraints is positive and significant for emerging market firms. This indicates that, while on average reforms are associated with a reduction in leverage in emerging market firms, the reduction is smaller in firms that face financial constraints. It should be noted, however, that the magnitude of the coefficient of the interacted term is fairly small, so that overall this group of firms also reduces leverage in response to reforms.

Finally, we examine whether reforms might have a different effect on leverage for firms that have access to global capital markets, and are therefore less dependent on domestic credit conditions. We consider firms as having access to global markets if they have a bond rating or issue ADRs. The results in Table 7 show that the interacted terms are not significant. However, in this new regression the effect of reforms on leverage in advanced countries is positive and significant, suggesting that access to credit may have improved after reforms for advanced

²⁵ Observations in which firms were paying dividends account for 57.1 percent of the sample.

country firms unable to access global markets. We obtain similar results if we define access to global markets as having a bond rating rather than both ADR bond rating.

VII. CONCLUSIONS

The supply of finance to corporations has undergone broad changes in the last decades both in advanced and emerging market countries. Banking sectors have been deregulated along several dimensions: controls on interest rates have been removed, mandates on credit allocation reduced or lifted, many state-owned banks have been privatized, competition and new entry (including of foreign banks) have been encouraged, measures to improve bank supervision and regulation have been undertaken. The benefits and costs of this process of liberalization have been widely debated, and the recent financial crisis in advanced countries – which some see as a byproduct of mismanaged deregulation – has added fuel to the debate.

In this paper, we study how domestic credit market reforms have changed corporate debt policies. To explore this issue, we rely on a large cross-country panel of data and novel, time-varying measures of credit market reforms. We find that domestic financial reforms resulted in lower leverage for firms in emerging markets, and had no significant effect in advanced countries. This finding is at odds with the view that reforms, by reducing the role for the government, fostering competition, and, more generally, allowing market forces to operate more freely, improve access to credit for corporations. This negative result is not due to the endogeneity of the reform process or heterogeneity across firms, and is robust to changes in the specification. Thus, the benefits of domestic financial reforms in terms of reducing the cost of credit and increase its availability may be relatively more difficult to secure in emerging markets,

where other institutional weaknesses may prevent liberalization measures from translating in more credit availability for corporations. In fact, we do find some evidence that there are complementarities between domestic financial reforms and good institutions, though this relationship needs to be explored further.

We acknowledge a number of limitations in our analysis. First, the data covers only a relative short time period, and it excludes the 1980s, when the bulk of financial liberalization in most advanced economies occurred. Also, reliance on Worldscope data limits our analysis to larger companies, so that the effects of liberalization on smaller enterprises cannot be studied. Because of lack of data, we have also been unable to control for changes in tax regime which might alter the relative cost of debt and equity. Studies of financial reforms in specific countries may be able to address some of these limitations.

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Table 1
Descriptive Statistics

This table provides descriptive statistics for the variables in the sample of advanced countries and emerging countries as well as the overall sample. The sample covers 13,457 firms and 57,473 observations in 22 advanced and 14 emerging markets over the period 1995-2002. Firm level variables are as follows: leverage is the ratio of total debt to total assets; growth opportunities are measured as the ratio of market value of assets to book value of assets; size is natural logarithm of total assets; tangibility is the ratio of net plant property and equipment to total assets; profitability is EBIT divided by total assets. Country level variables are as follows: Share turnover is the share turnover of all stocks in a country; inflation is the natural logarithm of one plus the annual change in consumer prices; GDP per capita is the natural logarithm GDP per capita at purchasing power parity; GDP growth is the annual change of GDP per capita; growth volatility is the standard deviation of GDP growth over five years; the real interest rate is measured as $[(1+i)/(1+\pi)-1]$, where i is the nominal interest rate and π is the rate of inflation; country risk is the International Country Risk Guide composite index (decreasing in risk); lack of corruption is an index from *Transparency International*; bank concentration is the three-bank concentration ratio. Stock market turnover is the ratio of total shares traded and market capitalization; banking crisis is a dummy for the year of a banking crisis and the two following years; creditor rights is an index of creditor rights obtained from Djankov, McLiesh and Shleifer (2007); Creditor information is a dummy equal to one if there is a credit registry or credit bureau in the country. Financial openness is the capital market liberalization index from Schindler (2009). Financial reform index is from Abiad, Detragiache and Tressel (2009). The sample series are winsorized at 0.5% levels of the tails of the distribution.

Variable	Mean	Standard Deviation	Minimum	Maximum
Leverage	0.274	0.195	0.000	0.884
Growth opportunities	1.281	1.364	0.212	10.962
Size	8.948	3.175	-3.238	19.481
Tangibility	0.331	0.218	0.007	0.931
Profitability	0.004	0.263	-2.192	0.372
Bond rate	0.106	0.307	0.000	1.000
ADR	0.041	0.197	0.000	1.000
Openness	0.912	0.229	0.000	1.000
Financial reforms	0.873	0.155	0.133	1.000
GDP Growth	0.017	0.025	-0.143	0.233
GDP volatility	0.018	0.021	0.002	0.128
Inflation	0.024	0.043	-0.031	0.500
Real interest rate	0.048	0.065	0.000	0.920
GDP per capita	10.000	0.648	7.459	10.491
Lack of corruption	6.955	1.708	1.000	10.000
Bank concentration	0.438	0.158	0.268	0.997
Stock market turnover	100.280	57.800	7.500	225.820
Banking crisis	0.011	0.106	0.000	1.000
Country risk	80.989	6.259	42.000	91.000
Creditor rights	1.795	1.136	0.000	4.000
Creditor information	0.963	0.189	0.000	1.000

Table 2. Corporate Debt and Credit Market Reforms

This table shows how credit market reforms affect corporate debt, controlling for the macroeconomic and firm level factors (Specification 2). The sample covers 22 advanced and 14 emerging markets over the period 1995-2002. Variable definitions are given in Table 1. All independent variables are lagged by one period. The regressions include firm dummies and time dummies (separate for emerging and advanced countries). Standard errors are clustered by country.

	Coefficient	Standard error	P-value
<u>Credit market reforms:</u>			
Reforms	-0.256	0.417	0.542
<u>Firm level variables:</u>			
Growth opportunities	-0.082	0.007	0.000
Size	0.009	0.004	0.031
Tangibility	0.978	0.075	0.000
Profitability	-0.317	0.074	0.000
Bond rate	0.276	0.028	0.000
ADR	0.036	0.173	0.837
<u>Country level variables:</u>			
Stock market turnover	-0.001	0.000	0.046
Banking crisis	0.037	0.085	0.666
GDP growth	-0.010	0.221	0.963
GDP growth volatility	-0.776	0.736	0.299
Real interest rate	0.065	0.480	0.893
Inflation	-0.174	0.238	0.468
GDP per capita	1.257	0.475	0.012
Lack of corruption	0.064	0.023	0.008
Bank concentration	0.081	0.245	0.744
Country risk	-0.008	0.004	0.047
Creditor rights	0.120	0.020	0.000
Credit information	-0.067	0.065	0.310
Financial openness	-0.093	0.085	0.283
No. of observations:	57,473		
R-squared	0.0013		

**Table 3. Corporate Debt and Credit Market Reforms:
Differential Effects in Advanced and Emerging Market Countries**

This table shows how credit market reforms affect corporate debt in emerging markets and advanced economies, controlling for country and firm level factors. The sample covers 22 advanced and 14 emerging markets over the period 1995-2002. Variable definitions are given in Table 1. Advanced and emerging are dummy variables for advanced and emerging countries respectively. In specification (1), credit market reforms are interacted with advanced and emerging dummies. In specification (2), share turnover is interacted with both credit market reforms and with advanced and emerging dummies. All explanatory variables are lagged by one period. The regressions include firm dummies and time dummies (separate for emerging and advanced countries). Standard errors are clustered by country.

	Coefficient	(1) Standard error	P-value
<u>Credit market reforms:</u>			
Reforms*Advanced	0.585	0.407	0.160
Reforms*Emerging	-1.217	0.409	0.005
<u>Firm level variables:</u>			
Growth opportunities	-0.081	0.007	0.000
Size	0.009	0.004	0.025
Tangibility	0.979	0.075	0.000
Profitability	-0.318	0.074	0.000
Bond rate	0.273	0.028	0.000
ADR	0.035	0.173	0.840
<u>Country level variables:</u>			
Share turnover	-0.001	0.000	0.009
Banking crisis	0.027	0.089	0.760
GDP growth	-0.039	0.231	0.867
GDP growth volatility	-1.119	0.542	0.047
Real interest rate	0.181	0.445	0.687
Inflation	-0.300	0.272	0.277
GDP per capita	1.341	0.451	0.005
Lack of corruption	0.075	0.022	0.002
Bank concentration	0.057	0.232	0.808
Country risk	-0.010	0.004	0.027
Creditor rights	0.122	0.019	0.000
Credit information	-0.031	0.049	0.535
Financial openness	-0.052	0.087	0.556
No. of observations:	57,473		
R-squared	0.0002		

Table 4.
Differential Effects of Credit Market Reforms on Corporate Debt Based on Country Characteristics

This table shows how the effect of credit market reforms on leverage changes depending on the degree of corruption, the ICRG country risk score, the level of protection of creditor rights in bankruptcy, and the presence of credit registries/credit bureaus. The sample covers 22 advanced and 14 emerging markets over the period 1995-2002. All independent variables are lagged by one period. The regressions include all the control variables as the regressions of Table 2, as well as firm dummies and time dummies (separate for emerging and advanced countries) (not reported).

Explanatory variable	Coefficient	Standard error	p-value
Lack of Corruption			
Reforms	-1.238	0.626	0.056
Reforms*Lack of corr.	0.185	0.101	0.077
Country Risk			
Reforms	-3.007	1.045	0.007
Reforms*Country Risk	0.035	0.014	0.017
Creditor rights			
Reforms	-0.187	0.581	0.813
Reforms*Creditor Rights	-0.064	0.273	0.816
Creditor information			
Reforms	-1.062	0.502	0.042
Reforms*Creditor Info.	0.990	0.475	0.044

Table 5. Effects of Different Reform Policies on Corporate Debt

This table shows how each of the five credit market reforms affect leverage, controlling for country and firm level factors. The sample covers 22 advanced and 14 emerging markets over the period 1995-2002. Competition, Supervision, Interest Rate, Credit Allocation, and Privatization are subindexes of the financial reform index. They are described in Appendix 3. Other variable definitions are given in Table 1. Advanced and emerging are dummy variables for advanced and emerging markets respectively. All explanatory variables are lagged by one period. The regressions include firm dummies and time dummies (separate for emerging and advanced countries). Standard errors are clustered by country.

	Coefficient	Standard error	P-value
<u>Credit market reform subindexes:</u>			
Competition*advanced	0.148	0.094	0.125
Competition*emerging	-0.248	0.204	0.233
Supervision*advanced	0.086	0.117	0.467
Supervisions*emerging	-0.139	0.130	0.293
Interest rate*emerging	0.060	0.123	0.626
Credit allocation*advanced	0.283	0.231	0.230
Credit allocation*emerging	-0.397	0.096	0.000
Privatization*advanced	-0.121	0.277	0.665
Privatization*emerging	0.046	0.150	0.761
<u>Firm level variables</u>			
Growth opportunities	-0.081	0.007	0.000
Size	0.010	0.004	0.022
Tangibility	0.977	0.076	0.000
Profitability	-0.317	0.074	0.000
Bond rate	0.270	0.028	0.000
ADR	0.034	0.176	0.847
<u>Country level variables</u>			
Stock market turnover	-0.001	0.000	0.010
Banking crisis	0.093	0.079	0.251
GDP growth	0.103	0.238	0.666
GDP growth volatility	-1.175	0.510	0.028
Real interest rate	-0.122	0.444	0.785
Inflation	-0.315	0.260	0.235
GDP per capita	1.027	0.463	0.033
Lack of corruption	0.083	0.026	0.003
Bank concentration	0.117	0.225	0.605
Country risk	-0.011	0.005	0.025
Creditor rights	0.130	0.021	0.000
Credit information	0.061	0.051	0.240
Financial openness	-0.045	0.083	0.591
No. of observations:	57,473		
R-squared	0.000		

Table 6. Alternative Specifications

This table shows how credit market reforms affect leverage, controlling for the macroeconomic and firm level factors using alternative specifications. The sample covers the period 1995-2002 for 22 advanced and 14 emerging countries. Variable definitions are given in Table 1. In specification (1), leverage is defined as total debt divided by the book value of equity. In specification (2), estimation method is GMM. All independent variables are lagged by one period. The regressions include firm dummies and time dummies (separate for emerging and advanced countries). Standard errors are clustered by country.

	Debt-to-equity			GMM		
	Coefficient	Standard error	P-value	Coefficient	Standard error	P-value
Credit Market Reforms:						
Reforms*advanced	0.551	0.556	0.329	0.481	0.249	0.053
Reforms*emerging	-1.869	0.723	0.014	-1.230	0.316	0.000
<u>Firm level variables:</u>						
Lagged leverage				0.427	0.025	0.000
Growth opportunities	-0.108	0.012	0.000	-0.047	0.008	0.000
Size	0.012	0.007	0.102	-0.001	0.003	0.738
Tangibility	1.438	0.195	0.000	-0.250	0.127	0.049
Profitability	-0.394	0.181	0.037	0.402	0.061	0.000
Bond rate	0.426	0.067	0.000	-0.117	0.043	0.007
ADR	0.003	0.272	0.990	-0.103	0.137	0.452
<u>Country level variables:</u>						
Stock market turnover	-0.002	0.001	0.002	0.000	0.000	0.443
Banking crisis	-0.014	0.145	0.925	-0.143	0.049	0.004
GDP growth	-0.133	0.456	0.773	-0.199	0.302	0.509
GDP growth volatility	-2.443	0.745	0.002	-1.730	0.615	0.005
Real interest rate	-1.114	0.567	0.058	-0.730	0.270	0.007
Inflation	-1.814	0.664	0.010	-0.996	0.190	0.000
GDP per capita	2.855	0.988	0.007	0.538	0.280	0.055
Lack of corruption	0.114	0.047	0.021	0.051	0.015	0.001
Bank concentration	0.225	0.435	0.608	-0.277	0.168	0.100
Country risk	-0.013	0.008	0.114	-0.011	0.003	0.000
Creditor rights	0.186	0.034	0.000	0.052	0.013	0.000
Credit information	-0.027	0.157	0.863	0.116	0.064	0.071
Financial openness	-0.228	0.122	0.069	0.100	0.062	0.108
No. of observations:	37,996			42,347		
R-squared	0			Arellano-Bond test for zero auto-correlation in first-differenced errors		
				Order	z	P-value
				1	-17.749	0.000
				2	0.217	0.828
				Sargan test of overidentifying restrictions		
				H0: overidentifying restrictions are valid		
				$\chi^2(5) = 2.222$		
				Prob > $\chi^2 = 0.818$		

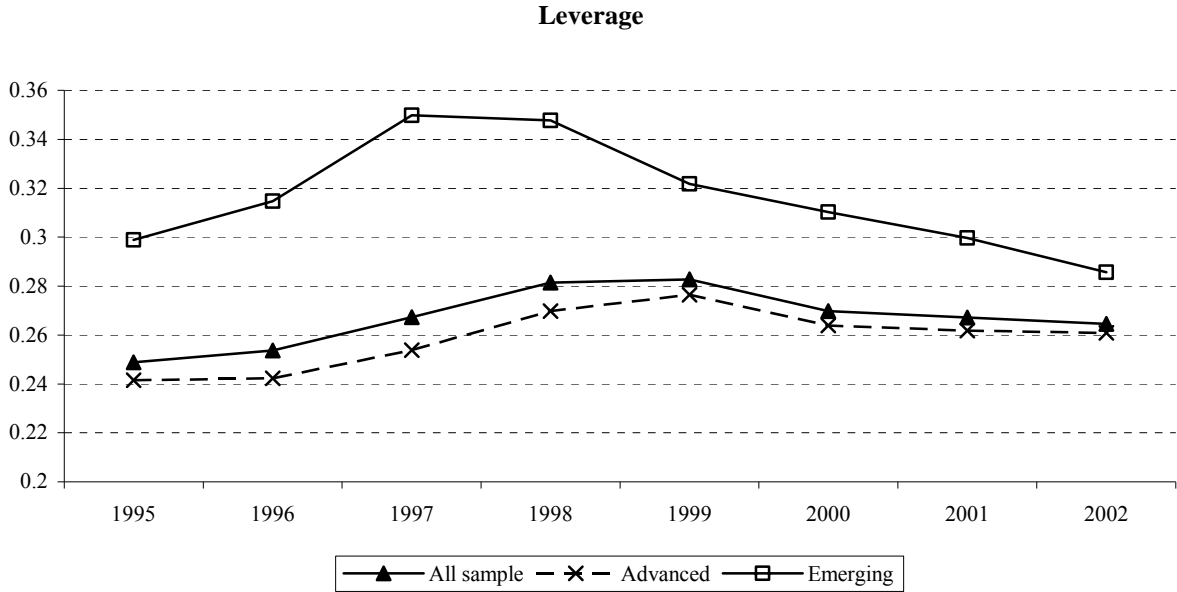
Table 7
Corporate Debt and Credit Market Reforms:
Differential Effects across Firms

This table shows how credit market reforms affect corporate debt, allowing for differential effects for firms in advanced and emerging countries and firms in sectors that are more financially dependent (Rajan and Zingales, 1998), firms that are financially constrained (i.e., it is not paying dividend and the Tobin's Q of the firm in that year is greater than one or greater than the median Tobin's Q of the country in that year), and firms that do not have access to global capital markets (i.e., they have no bond rating nor they issue ADRs). The sample covers 22 advanced and 14 emerging markets over the period 1995-2002. Variable definitions are given in Table 1. The regressions include firm dummies and time dummies (separate for emerging and advanced countries), and the same set of explanatory variables included in the regressions of Table 2. Standard errors are clustered by country.

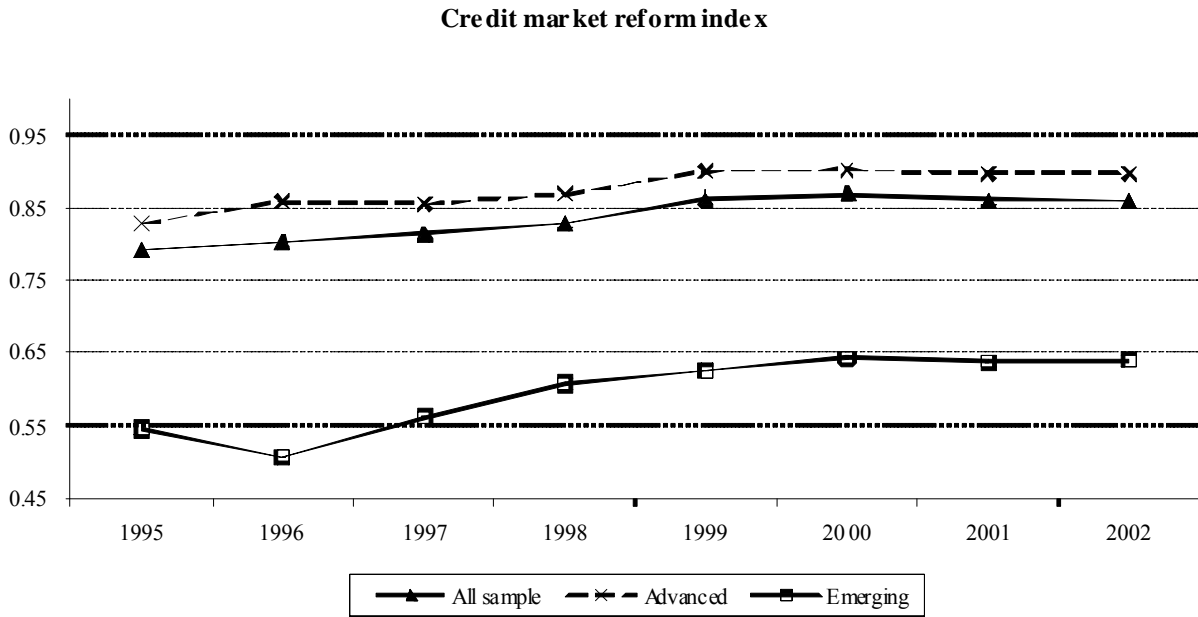
	Coefficient	Standard error	P-value
Reforms*Advanced	0.533	0.479	0.274
Reforms*Emerging	-1.593	0.808	0.057
Reforms*MoreFinDep*Advanced	0.161	0.153	0.299
Reforms*MoreFinDep*Emerging	0.560	0.741	0.455
Reforms*Advanced	0.587	0.410	0.161
Reforms*Emerging	-1.232	0.403	0.004
Reforms*Constrained*Advanced	-0.043	0.038	0.275
Reforms*Constrained*Emerging	0.190	0.101	0.069
Reforms*Advanced	0.823	0.362	0.029
Reforms*Emerging	-1.322	0.404	0.002
Reforms*GlobalAccess*Advanced	0.045	0.092	0.628
Reforms*Global*Emerging	-0.045	0.323	0.889

Figure 1: Evolution of Corporate Debt and the Credit Market Reforms Index,

This figure shows time series of sample mean leverage and domestic financial reforms index panel 1A and 1B, respectively. Each figure presents the values for overall sample, advanced economies and emerging markets.



Panel A



Panel B

Appendix 1

Data description

Table A1

Country	No. of firms in sample
ARGENTINA	23
AUSTRALIA	311
AUSTRIA	37
BELGIUM	82
BRAZIL	117
CANADA	489
CHILE	90
CHINA	134
DENMARK	108
FINLAND	94
FRANCE	546
GERMANY	524
GREECE	196
HONG KONG	343
HUNGARY	15
INDIA	249
INDONESIA	166
ISRAEL	55
ITALY	155
JAPAN	2589
MALAYSIA	442
MEXICO	79
NETHERLANDS	132
NEW ZEALAND	40
PAKISTAN	59
PERU	41
PHILIPPINES	74
PORTUGAL	62
SINGAPORE	257
SPAIN	88
SWEDEN	180
THAILAND	256
TURKEY	109
UNITED KINGDOM	962
UNITED STATES	4353
Total	13457

Table A2.**Pair-Wise Correlations****Pane A. Financial Reform Subindexes**

	Financial reforms	Competition	Supervision	Interest rates	Credit allocation	Privatization
Financial reforms	1					
Competition	0.508	1				
Supervision	0.760	0.066	1			
Interest rates	0.629	0.544	0.185	1		
Credit allocation	0.793	0.237	0.645	0.389	1	
Privatization	0.812	0.190	0.581	0.413	0.497	1

Panel B. Firm Level Variables

	Leverage	Growth opportunities	Size	Tangibility	Profitability	Bond rate
Leverage	1					
Growth opportunities	-0.144	1				
Size	0.128	-0.138	1			
Tangibility	0.257	-0.151	0.116	1		
Profitability	-0.048	-0.169	0.223	0.101	1	
Bond rate	0.160	-0.011	0.174	0.063	0.065	1
ADR	0.029	-0.012	0.150	0.039	0.037	0.131

Table A.2 –continued

Panel B: Correlations of Country Level Variables

	Financial reforms	Openness	GDP growth	GDP volatility	Inflation	Real interest rate	GDP per capita	Stock turnover	Banking crisis	Country risk	Creditor rights	Creditor info.	Bank conc.
Financial reforms	1												
Openness	0.399	1											
GDP growth	-0.061	-0.118	1										
GDP volatility	-0.165	-0.307	-0.194	1									
Inflation	-0.202	-0.198	-0.037	0.142	1								
Real interest rate	-0.090	-0.212	0.022	0.040	0.845	1							
GDP per capita	0.831	0.817	-0.125	-0.307	-0.274	-0.074	1						
Stock market turnover	0.372	0.160	-0.027	-0.262	0.028	-0.011	0.296	1					
Banking crisis	-0.148	-0.154	-0.462	0.261	0.366	0.247	-0.203	-0.063	1				
Country risk	0.548	0.624	0.015	-0.356	-0.384	-0.106	0.789	0.045	-0.276	1			
Creditor rights	-0.136	-0.092	0.029	0.205	-0.032	-0.015	-0.153	-0.358	0.041	0.056	1		
Creditor information	0.512	0.419	-0.078	-0.059	-0.093	0.001	0.582	0.055	-0.088	0.349	-0.090	1	
Bank concentration	-0.169	-0.140	0.124	0.291	0.097	0.033	-0.302	-0.367	0.034	-0.158	0.325	-0.051	1
Lack of corruption	0.795	0.675	0.015	-0.230	-0.366	-0.213	0.822	0.202	-0.192	0.735	0.058	0.431	0.004

Appendix 3

Coding Rules Used in the Financial Reform Database

1. Credit Allocation (range 0-4)

- 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. Interest Rate Controls (range 0-3)

- Controls on deposit and lending bank interest rates

3. Entry Barriers (range 0-3)

- 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)

4. Banking Supervision (range 0-3)

- 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

5. Privatization (range 0-3)

- Extent of state ownership of banking sector assets

Source: Abiad, Tressel, and Detragiache (2009).