

**International Studies Program
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the Level and Maturity of
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Contract Enforcement, Institutional Stability, and the Level and Maturity of International Debt

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Abstract

Contract enforcement and institutional stability play an important role in determining the level and maturity of international debt. Contract enforcement is modeled as a fixed cost that investors incur to obtain the contracted, gross returns on international investments. Institutional stability is modeled as the probability that the same contract enforcement cost will persist over time. Countries with poor contract enforcement and institutionally unstable impose higher contract enforcement costs and increase uncertainty about their structure. The level and maturity of international debt is reduced as a result. The empirical estimation provides support for the hypothesis. Stronger contract enforcement and institutional stability increase international lending and lengthen its maturity.

Keywords: Contract enforcement; Institutions; Stability; International Lending; Maturity

JEL classification: F34

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1. Introduction

This paper studies the effect of contract enforcement and institutional stability on the level and maturity of international debt. Developing knowledge about such relationship is important in explaining the determinants of international capital flows and the reduction in debt maturity that preceded the East Asian financial crises of the 1990s.

The examination of the role of contract enforcement and institutional factors has been burgeoning in the literature on growth, development, foreign investment, and trade. In the growth literature, contract enforcement along with other political and institutional factors have been considered to be important in speeding up economic growth. Countries with weak contract enforcement and unstable institutions have low investment rates and slow growth.¹

In the development literature, contract enforcement has been considered important for banking and financial development. Countries with legal systems that enforce contracts and protect creditors' rights are more financially developed than countries with lax legal systems and have larger size of capital markets and external firm finance (Levine 1998; La Porta et al., 1997 and 1998; Levine, Loayza, and Beck 2000). In addition, countries with less investor protection are more prone to experience banking crises (DemirguH-Kunt and Detragiache 1998).

Examining the role of contract enforcement and other institutional factors has also been extended to trade and FDI. In trade, imperfect contract enforcement has been argued to reduce comparative advantage by tightening credit markets (Kletzer and Bardhan

¹ Hall and Jones (1999), Knack and Keefer (1995), Barro (1991), and Kormendi and Meguire (1985) argue that the political and institutional factors influence growth through investment. Politically unstable and institutionally weak countries have slower growth because of the lower investment rates. See also Scully 1988; Grier and Tullock 1989; Mauro 1995; Alesina, Ozler, Roubini and Swagel 1996; and Chong and Calderon 2000.

1987). It also has stronger constraining effect on trade than tariffs do (Anderson and Marcouiller 1999).² In addition, corruption and poor governance are found to negatively influence FDI. Hines (1995) found that U.S. foreign investment is negatively related to corruption in the host country, while Wei and Wu (2001) found that poor governance is robustly associated with lower FDI-loan ratios, a contributing factor to currency crises.³

In the international capital flows literature, the importance of contract enforcement and other institutional factors did not attract much attention. The literature on country risk and debt repudiation that evolved in the wake of the international debt crises of the 1980s rather proposed that despite the absence of explicit mechanisms for enforcing international lending contracts with sovereign borrowers, borrowers choose to repay their obligations (Eaton and Gersovitz 1981; Eaton, Gersovitz, and Stiglitz 1986; Grossman and van Huyck 1988). Borrowers do not repudiate debt because of the threat of future loss of access to international capital markets. In other words, the costs of future exclusion from international capital markets act as an incentive or a deterrent to borrowers to pay back their debt.

In the financial crises literature, few papers have systematically studied the factors that contribute to shorter maturity. Shorter maturity is argued to increase the volatility of international capital flows and contribute to financial crises (Furman and Stiglitz 1998; Radelet and Sachs 1998; Rodrick and Velasco 1999). In explaining capital flows crises, Rodrick and Velasco (1999) examined the determinants of maturity structure of international debt, including corruption as an institutional factor. They argued that

² Tighter credit markets reduce the availability of working capital and therefore production, given a fixed relative price of outputs.

³ Wei and Wu (2001) consider poor public governance to include bureaucratic corruption, deviations from rule of law, and excessive and arbitrary government regulations.

corruption plays a role in shortening the debt maturity by generating expectations of bailouts, inadequate risk internalization of short-term borrowing, and therefore more short-term borrowing.⁴

In this paper we examine the influence of contract enforcement and institutional stability on the level and maturity of international debt. Examining such issue contributes to the literature in two respects. First, it extends the analysis of the role of contract enforcement and institutional factors to the international capital flows literature similar to the growth and development literature. Second, it extends the seminal work by Eaton and Gersovitz (1981), Eaton, Gersovitz, and Stiglitz (1986), and Grossman and van Huyck (1988) by examining whether contract enforcement matters for international lending.

The theoretical framework we develop models imperfect contract enforcement as an additional cost that lenders incur in collecting loan repayment from foreign country borrowers. This approach is similar to Anderson and Marcouiller (1999). We show that greater contract enforcement costs, associated with weak legal systems, result in a lower level of international lending as investors with lower wealth find it unprofitable to invest internationally. This result is consistent with Barron and Valev (2000), who showed that international lending is populated mostly by larger institutions.⁵ We also show that in the presence of future uncertainty legal institutions stability, the maturity of investment is reduced.

We use panel data for 83 developing and emerging market economies over the period 1982-1997 covering international debt and institutional variables. Data on international debt are obtained from Global Development Finance. Proxies for contract enforcement

⁴ However, the coefficient of the corruption variable was insignificant in explaining debt maturity.

⁵ See Barron and Valev (2000) for differences in international exposure between smaller and larger US banks.

costs and the legal system stability are obtained from the International Country Risk Guide (ICRG). The results confirm the predictions of the model. Imperfect contract enforcement contributes to lower levels of lending.⁶ In addition, greater institutional stability contributes to lengthening loan maturity.

The paper proceeds as follows. Section II presents a simple theoretical model for the relationship between the contract enforcement and institutional stability on the level and maturity of international debt and develops testable hypotheses. Section III discusses the data. Section IV discusses empirical issues and estimation methodology. Section V presents the empirical results. Section VI offers some concluding comments.

2. Theoretical Framework

Consider the problem of investor i who has wealth W_i to invest over a two-period horizon: t and $t+1$. There are three investment vehicles: a two-period (long-term international) bond that matures in period $t+1$, a one period (short-term international) bond that matures at the end of period t but is renewable, and a domestic one-period bond. The long-term bond cannot be sold before maturity. The gross return on the long-term bond is R_L ; the investor obtains $R_L W_i$ at the end of period $t+1$. The gross returns on the one-period and the domestic bonds are R_S and R_0 , respectively. Assume that $R_L > 2R_S > 2R_0 > 2$.⁷ Also assume for simplicity that investment profits obtained in period t cannot be invested in period $t+1$.

Contract enforcement is modeled as a fixed cost that an investor i incurs in order to obtain the contracted, gross returns on international investments. The investor incurs an

⁶ This result is similar to what Kletzer and Bardhan (1987).

⁷ While that assumption biases the results quantitatively away from short-term debt, it does not change the qualitative predictions of the model.

enforcement costs C_t in period t and C_{t+1} in period $t+1$. The idea is that any contract can be enforced in any country. However, the cost of contract enforcement would vary with the degree of strength of the legal system. Countries with weaker legal systems would in effect impose higher fixed costs on borrowers than countries with strong legal systems.⁸ In addition, institutional stability is modeled as the probability that the same contract enforcement cost will persist over time. In countries with stable legal institutions, the contract cost persistence probability is high. Persistence probability will be higher in countries with more stable legal institutions than in countries with less stable institutions.

Assume that investor i knows the enforcement cost C_t before she makes an investment decision in period t . However, the cost C_{t+1} is known only after investment decisions are made in period $t+1$. Let δ be the probability that C_t equals C_{t+1} , while $1 - \delta$ is the probability that C_{t+1} exceeds C_t by an amount C^* .

$$(1) \quad \Pr(C_{t+1} = C_t) = \delta, \quad \delta \in [0,1]$$

$$(1') \quad \Pr(C_{t+1} = C_t + C^*) = 1 - \delta, \quad C^* > 0$$

Assume that investor i renews her investment in the short-term international bond in period $t+1$ if the contract enforcement cost is the same in both periods. If the cost increases, she invests in the domestic bond. The expected return on investment in the short-term international bond in period t is given by:

$$(2) \quad ER_{Si} = (1 + \delta)(R_S W_i - C_t) + (1 - \delta)R_0 W_i$$

⁸ For simplicity of exposition, we have assumed that lenders can distinguish between borrowers in foreign countries. Therefore, uncertainty arises only because of possible changes in the cost of contract enforcement in the future. For a model of international lending with asymmetric information see Barron and Valev (2000).

The investor invests in the domestic bond in period $t+1$ if the net benefit from investing in the domestic bond exceeds the net benefit from investing in the one-period international bond:

$$(3) \quad W_i R_0 > W_i R_S - (C_t + C^*)$$

which implies that she will invest in the domestic bond if the additional cost in the second period C^* is sufficiently high:

$$(3p) \quad C^* > W_i (R_S - R_0) - C_t.$$

We assume this is the case. The expected return on investment in the long-term bond is given by:

$$(4) \quad ER_{Li} = R_L W_i - [\delta C_t + (1 - \delta)(C_t + C^*)]$$

The expected return on investment in the domestic bond is given by:

$$(5) \quad ER_{0i} = 2R_0 W_i$$

Compared to investment in the short-term international bond, investment in the long-term international carries an enforcement cost only once at the end of period $t+1$. However the size of that cost is uncertain. Thus the advantages of the two-period bond, relative to the one-period international bond, derive from the higher return ($R_L > 2R_S$) and the frequency and timing of enforcement cost; the investor incurs enforcement costs only once in period $t+1$. The advantage of the one-period international bond derives from the possibility that investor i invests in the domestic bond in period $t+1$ if the enforcement cost increases by C^* in period $t+1$.

We can see from equations (2), (4), and (5) that the expected returns depend on wealth. As W_i gets closer to zero, the expected return on the domestic asset exceeds the expected returns on both international assets. With wealth close to zero, investment in the one-period international bond yields higher expected return compared to investment in the two-period bond if:

$$(6) \quad C^* > \frac{\delta}{1-\delta} C_i$$

Intuitively, greater additional cost, C^* , in period $t+1$ increases the expected cost of investment in the two-period bond and lowers its attractiveness compared to the one-period international bond. We proceed with the assumption that inequality 6 holds. On the other hand, the return on the two-period bond increases faster with wealth compared to the expected return on the one-period international bond, which in turn increases faster in wealth compared to the expected return on the domestic bond:

$$(7) \quad \frac{\partial ER_{Li}}{\partial W_i} = R_L > \frac{\partial ER_{Si}}{\partial W_i} = R_S + R_0 + \delta(R_S - R_0) > \frac{\partial ER_{0i}}{\partial W_i} = 2R_0$$

Figure 1 reflects the above relationship between expected returns and wealth for the three assets. For wealth W_i close to zero, the expected return on domestic bond is the highest. In contrast the expected return on the two-period bond has the highest growth rate.

From equations (6) and (7), there are minimum levels of investment W^* and W^{**} such that for wealth $W_i > W^*$ investment in the one-period international bond yields greater expected return compared to investment in the domestic asset and similarly for wealth $W_i > W^{**}$, investment in the two-period bond yields greater expected return compared to

the one-period international bond, respectively. The minimum level W^*_j is identified by equating $ER_{S_i} = ER_{0_i}$, which yields:

$$(8) \quad W^* = \frac{C_t}{R_S - R_0} > 0$$

From equation 8, a higher enforcement cost C_t increases the minimum level of wealth W^* for which investing in the one-period bond yields higher expected return compared to the domestic bond. A higher return on the one-period international bond R_S lowers the minimum level of wealth W^* and therefore increases the range of wealth W_i for which investing in the international bond is more advantageous.

Similarly, solving for W^{**} we equate $ER_{S_i} = ER_{L_i}$. This yields:

$$(9) \quad W^{**} = \frac{C^*(1-\delta) - \delta C_t}{R_L - R_S - R_0 - \delta(R_S - R_0)} > 0$$

To see why equation (9) is positive, note that the numerator is positive from equation (6). For the denominator, note that with $\delta = 1$, the denominator reduces to $R_L - 2R_S > 0$ and is therefore positive for lower values of δ as well.

Figure 1 shows an example where $W^{**} > W^*$. If $W_i < W^*$, investor i invests in the domestic bond. If $W_i > W^{**}$, she invests in the two-period bond. If $W^* < W_i < W^{**}$, she invests in the one-period international bond.

Now assume that there are multiple investors who face the same problem as investor i but have different wealth levels. Let the distribution of wealth $F(W_i)$ be defined on the interval $[W', W'']$ such that $0 < W' < W^* < W^{**} < W''$. Therefore, investments in the

domestic bond W_0 , the one-period international bond W_S , and the two-period international bond W_L , are given by the following expressions, respectively:

$$(10) \quad W_0 = \int_{W^*}^{W^*} W_r dF(W_r)$$

$$(11) \quad W_S = \int_{W^{**}}^{W^{**}} W_r dF(W_r)$$

$$(12) \quad W_L = \int_{W^{**}}^{W''} W_r dF(W_r)$$

How do changes in the various parameters affect the level and maturity composition of international investment? From equations (8) and (9), an increase in the enforcement cost C_t decreases the attractiveness of the one-period international bond relative to the domestic bond through higher W^* , and relative to the two-period bond through lower W^{**} . Therefore, an increase in enforcement costs will decrease the level of international lending and, if not accompanied by a similar cost increase in C^* , will increase the average maturity.

From equation (9), an increase in the additional enforcement cost C^* increases the minimum wealth level W^{**} for which investment in the two-period bond is more advantageous compared to the one-period international bond. Therefore, the level of international lending is the same but with shorter maturity.

The effect of greater probability of enforcement cost persistence δ on W^{**} is ambiguous. To see that note that greater persistence reduces both the numerator and denominator of equation (9). The ambiguity arises for the following reason, however. On

the one hand, greater persistence increases the expected return on the one-period international bond, from equation 2. This effect is stronger the higher the return on the one-period bond R_S . On the other hand, greater persistence increases the return on the two-period international bond from equation 4. This effect is higher the greater the potential additional cost C^* in period $t+1$. Thus, if C^* is large relative to R_S , the effect of higher δ is to lower W^{**} thereby increasing the range of wealth for which investment in the two-period bond is more advantageous. Clearly, the magnitude of those effects is determined by the distribution of wealth across investors. Changes in the threshold levels of wealth W^* and W^{**} can lead to a various changes in lending activities depending on the shape of the distribution $F(W_i)$.

In the empirical part of the paper we examine the effect of greater contract enforcement cost C_t on the level and maturity of lending. The model predicts that a higher enforcement cost would result in a lower level of lending and shorter maturity. We also examine the effect of greater persistence in enforcement cost on lending maturity.

3. Data

We use panel data to examine the influence of contract enforcement and institutional stability consisting of annual observations for 83 developing and emerging market economies for the period 1982-1997. Table 1 provides a list of the sample countries broken down by region. The countries selected constitute a joint subset of countries in International Country Risk Guide (ICRG) and Global Development Finance (GDF), which are the data sources for the institutional and international debt variables, respectively, as discussed further below.

3.1 Contract Enforcement and Institutional Stability

Proxy measures for contract enforcement cost and institutional stability are obtained from the political risk index of ICRG⁹. ICRG's political risk index is based on poll of experts' opinions and ratings of twelve political risk indicators. The indicators are government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. ICRG's data comprise monthly observations on the twelve components starting 1982 on a number of developed and developing countries that has reached 140 countries.

PRS also issues an academic version of ICRG – IRIS3 – which we use in this paper. IRIS3 include annual values for six indicators of quality of governance over the period 1982-1997.¹⁰ The six indicators are the risk of repudiation of contracts by government, the risk of expropriation of private investment, corruption in government, rule of law, quality of the bureaucracy, and ethnic tensions.¹¹ The advantage of this dataset is that the first five indicators reflect contract enforcement and institutional stability, which are the focus issues of this paper. However, one limitation of the dataset is that some of five indicators we are particularly interested in are not available separately beyond 1997. Data beyond 1997 do not separate out the risk of contract repudiation by government and the risk of private investment expropriation.

⁹ ICRG is a publication of The Political Risk Services (PRS) Group, a commercial service that provides financial, economic, and political risk assessment for investors.

¹⁰ Annual values are the mean values calculated from all 12 monthly values for each variable.

¹¹ See Appendix A for a description of each of these indicators.

The advantages and limitations of the methodology used in the construction of ICRG's political risk index are worth highlighting.¹² The polls of experts' opinion and ratings are designed for cross-country comparability. However, polls are subjective and are likely to be subject to two types of bias. First, experts' opinions are likely to be influenced by countries economic outcomes. If a country experiences high GDP growth rate, experts may overlook political and institutional risk. Second, the political agenda of the institution producing the rating may influence the ratings. Despite the limitation of the methodology, we agree with Kaufmann, Kraay, and Zoido-Lobaton (1999) that the usefulness of the data derives from its strong correlation with other measures and ratings, and is reflected in the considerable price tag that this service is consistently sold for.

The indicators we use to proxy for contract enforcement costs are the risk of contract repudiation by the government, the risk of expropriation of private investment, and corruption in the government. In addition we use the rule of law and the quality of bureaucracy components to proxy for the persistence in contract enforcement cost. Description of these indicators is provided in Appendix A. The risks of contract repudiation and private investment expropriation are rated on a 0-10 scale, with high score indicating low risk and vice versa. Government corruption, rule of law, and quality of bureaucracy are rated on a 0-6 score, with similar interpretation of the scores. To ease coefficient comparability among the different proxies, we transform the scores for the risks of contract repudiation and private investment expropriation to a 0-6 scale. One limitation we face relates to the absence of clear demarcation line for the coverage of

¹² See Kaufmann et al. (1999) for a discussion of the methodology used by the different data sources in rating institutions and governance.

each proxy. The different indicators seem to overlap with each other, as reflected in the correlation coefficients among them.

3.2 International Debt

Data on international debt are obtained from the World Bank's (2001) Global Development Finance. The total stock of external debt consists of long-term public, publicly guaranteed, and private non-guaranteed debt, the use of IMF credit, and short-term debt. Long-term debt is defined as a debt that has an original or extended maturity of more than one year. Public debt is an external obligation of the national government, political subdivisions, or autonomous public bodies. Publicly guaranteed debt is an external obligation of a private debtor that is guaranteed for repayment by a public entity. Private non-guaranteed external debt is an obligation of a private debtor that is not guaranteed for repayment by a public entity. Use of IMF credit comprises purchases outstanding under the credit tranches, trust fund loans, and operations under the structural adjustment and enhanced structural adjustment facilities. Short-term debt has an original maturity of one year or less. As discussed further below, short-term debt data do not allow us to distinguish between public and publicly guaranteed, on the one hand, and private non-guaranteed debt, on the other.

3.3 Summary Statistics

Table 2 provides a description of the variables used in estimation. Table 3 provides summary statistics for key variables for selected countries. Over the sample period, Nicaragua has the highest percentage of total external debt to GDP (450 percent), while Lebanon has the highest percentage of short-term debt (about 60 percent). On the other extreme, Myanmar has the lowest percentage of debt to GDP (0 percent), while Botswana

has the lowest percentage of short-term debt (1.5 percent). As for contract enforcement and institutional stability, the Czech Republic and South Africa were the lowest risk, on average, while the highest risk countries were mainly from Sub-Saharan Africa (Liberia, Somalia, and Guinea-Bissau). Summary statistics, by country, for the international debt and institutional variables are provided in Appendix B – Table 1. One can also observe the correlation among the different indicators from Table 4. For example, the Czech Republic has the highest score under contract repudiation risk, private investment expropriation risk, and the quality of bureaucracy. Table 4 provides the correlation coefficients for the different debt and risk indicators variables. The figures in this table seem to suggest that risk indicators are positively and significantly correlated with the level of debt and long-term debt. In other words, low risk encourages more international lending and lengthens the maturity of debt. The coefficients in the table also suggest that the different risk indicators are significantly correlated with each other.

4. Empirical Issues and Estimation Methodology

4.1 Empirical Issues

The seminal work of Eaton and Gersovitz (1981) and Eaton, Gersovitz, and Stiglitz (1986) on the analysis of country risk and international debt repudiation provide an appropriate starting point for examining the influence of contract enforcement on the level and maturity of international debt. Eaton and Gersovitz (1981), Eaton, Gersovitz, and Stiglitz (1986), and Grossman and van Huyck (1988) examined the issue of contract enforcement in the context of the international debt problem of the 1980s. They pointed out that the existence of sovereign borrowing is somewhat a “paradox” because there is no explicit mechanism that deters governments from debt repudiation. Sovereign

borrowers choose to repay their obligations because of their desire not to be cut off from international capital markets in the future. Because they focus on the threat of cut off from international capital markets, Eaton and Gersovitz (1981) examined in their empirical analysis proxies for the loss of international capital markets -- imports and export variability – but did not examine the issue of contract enforcement. In this paper we extend their analysis by examining the influence of contract enforcement and exclusion costs on the level and maturity of international debt.

In interpreting the results, we need to be aware of the possible influence of moral hazard on the level and maturity of international lending. One could argue that international lending might be subject to moral hazard associated with domestic and international guarantees. Domestic guarantees, explicit or implicit, to borrowers and/or international lenders might generate excessive borrowing or lending. International lending might be strongly motivated by guarantees provided by international institutions, such as the IMF, or by foreign governments. If such guarantees are common in countries with weak legal and judicial systems, and which are less institutionally stable, higher level of lending may result for any given level of contract enforcement and institutional stability, and thus the influence of these factors may be overestimated.

4.2 Model Specification and Estimation Methodology

4.2.1 The Level of International Debt

There are a number of plausible determinants of the level of international debt. In addition to contract enforcement and institutional stability, we include the level of income, the degree of development of the economy, the degree of sophistication of

financial intermediation, and the costs of future exclusion from international capital markets. Similar explanatory variables have been used in previous work.¹³

The level of income and the degree of economic development of the economy are important and significant determinants of international debt. The higher the income level and the more developed the economy, the more international lending the economy can obtain. We measure the level of income and the degree of economic development by nominal GDP and the logarithm of the real GDP per capita.

The degree of sophistication of financial intermediation can be an important factor in attracting lending. With more financial sophistication, domestic banks can attract more capital to finance investments. The degree of financial sophistication is measured by the percentage of private sector credit to GDP.

Costs of exclusion from international capital markets are deterrent to debt repudiation. The higher the exclusion costs, the lower is the probability of default, and therefore the higher level of lending the country can attract. We use trade-related finance to measure exclusion costs proxied by the percentage of imports of goods and services to GDP.

4.2.2 The Maturity of International Debt

We include similar explanatory variables in the determination of debt maturity. These include the degree of economic development, the degree of sophistication of financial intermediation, and the costs of future exclusion from international capital markets. Similar explanatory variables were used in Rodrick and Velasco (1999).

¹³ Eaton and Gersovitz (1981) and Rodrick and Velasco (1999) for example, include similar explanatory variables in the explanation of the level and maturity of international lending.

The degree of economic development is important determinant of international debt maturity. As the economy gets more developed and borrows more, it is more likely that it will borrow relatively more short-term debt. We measure the degree of economic development by the logarithm of the real GDP per capita.

The degree of sophistication of financial intermediation can be an important factor in attracting lending. With more financial sophistication, domestic banks can be more adept at increasing maturity transformation and therefore demand more short-term loans. The degree of financial sophistication is measured by the percentage of private sector credit to GDP.

The costs of exclusion from international capital markets act as a deterrent to debt repudiation, including short-term debt. As mentioned above, the higher the exclusion costs, the higher level of lending, including short term the country can attract. We use trade-related finance to measure exclusion costs proxied by the percentage of imports of goods and services to GDP.

4.2.3 Estimation Methodology

We use panel regressions in estimation. Fixed or random effects models are used as suggested by Hausman specification tests. If the Hausman test suggests the use of fixed effects model, we account for the unobservable country effects that each of the sample countries may have. We use STATA software in running regressions.

5. Empirical Results

5.1 The Level of Debt

5.1.1 Contract Enforcement

Table 5 reports the estimation results for fixed effects model for the level of debt using three proxies for contract enforcement. The results seem to support our hypothesis that an improvement in contract enforcement increases the level of debt. The coefficients of the different proxies for contract enforcement are significant. For example, the contract repudiation risk coefficient shows that as contract repudiation risk improves by 1 unit, lending increases by about \$0.8 billion. Similarly an improvement in expropriation risk by 1 unit leads to increases in lending of about \$1.2 billion. In addition, a decline in government corruption by 1 unit increases lending by about \$1 billion.

5.1.2 Other Explanatory Variables

The coefficients on the other explanatory variables are significant and have the same predicted sign. In specification (1), for example, an increase in the level of income by \$1 billion results in an increase in lending by \$85 million. An increase in real GDP per capita by 1 percent results in an increase in the level of lending by \$105 million. An increase in imports by \$1 billion results in an increase in lending by about \$425 million, while an increase in private sector credit by 1 percentage point results in an increase in lending by about \$62 million. The results for the imports variable are consistent with those obtained by Eaton and Gersovitz (1981) and suggest that as countries become more involved in trade, the costs of exclusion from international capital markets increase, thereby reducing the probability of default and encouraging more international lending.

The above results provide support to our hypothesis that better contract enforcement is important and significant for international lending. Better contract enforcement encourages international lending by increasing the prospects of getting paid back and collecting the contracted returns. The results also seem to support the importance of future exclusion from international capital markets as a deterrent mechanism for debt repudiation. Thus both contract enforcement and future exclusion from international capital markets seem to be significant factors in determining the level of international lending.

5.2 The Maturity of Debt

5.2.1 Contract Enforcement and Institutional Stability

Tables 6 and 7 provide econometric evidence on the determinants of the maturity of external debt. As hypothesized, an improvement in contract enforcement and institutional stability lengthen the maturity of debt. Also, an improvement in contract enforcement increases the percentage of long-term debt and reduces the percentage of short-term debt, as hypothesized. Specification (1) in Table 6, for example, suggests that a unit improvement in the risk of contract repudiation reduces the percentage of short-term debt by about 0.3 percentage point. Similarly specification (1) in Table 7 suggests that a unit improvement in the risk of contract repudiation increases the percentage of long-term debt by about 0.4 percentage points.

Improvement in institutional stability also lengthens the maturity of debt, as hypothesized. Specification (4) of Tables 6 and 7, for example, suggests that an improvement in the rule of law reduces the percentage of short-term debt by about 0.4

percentage points. It also increases the percentage of long-term debt by about 0.5 percentage points.

5.2.2 Other Explanatory Variables

For short-term debt, the coefficients for the explanatory variables coefficients also take the predicted signs. For example, in specification (1) of Table 6, the coefficients of the log of real GDP per capita and the percentage of private sector credit to GDP are positive and significant, a result consistent with those obtained by Rodrick and Velasco (1999). An increase in the real GDP per capita by 1 percent results in an increase in short-term debt of 0.07 percentage point. An increase in private sector credit by 1 percent results in an increase of short-term debt by 0.05 percent. The coefficient of the imports variable suggests that an increase in imports by \$1 billion results in an increase in the percentage of short-term debt by about 0.2 percentage point. The coefficient of the debt burden variable suggests that an increase in the level of debt by \$1 billion reduces the percentage of short-term debt by 0.06 percentage point. These results therefore indicate that an increase in economic development, financial sophistication, and trade activity reduces the maturity of debt. An increase in the level of debt, however, lengthens maturity. In other words, as developing and emerging countries get more developed debt maturity shortens.¹⁴

For long-term debt, the coefficients of the explanatory variables as expected have the opposite signs to those in the short-term debt. The results in specification (1) in Table 7 suggest that an increase in real GDP per capita reduces long-term debt. The coefficient of imports suggests that a \$1 billion increase in imports reduces long-term debt by about 0.2

¹⁴ The results for economic development and financial sophistication are consistent with Rodrick and Velasco (1999). However, their trade coefficient is insignificant.

percentage points. Also an increase in private sector credit by 1 percent reduces long-term debt by about 0.7 percent. Finally a \$1 billion increase in debt increase long-term debt by about 0.1 percentage point. These results suggest that as developing and emerging countries tend to be less developed, they will tend to attract more relative long-term debt.

5.3 Robustness

We conducted a set of robustness checks for the influence of contract and institutional stability on the level and maturity of international debt. First, we expressed the proxy variables in log forms. Second, we broke the sample into low- vs. middle-income countries. Thirds, we divided the sample period in two sub-periods: 1982-1989 and 1989-1997. Estimation results seemed to hold for the first two checks. In the third check, results seemed to hold only for 1989-1997.

6. Concluding Remarks

In this paper we have examined the influence of contract enforcement and institutional stability on the level and maturity of international debt. Our results show that these governance institutions matter. Improvement in contract enforcement increases the level of international debt and improvements in contract enforcement and institutional stability increase the average maturity of international debt.

This research could be extended in two directions. First, the influence of guarantees of international institutions, such as the IMF, remains to be examined. Such influence has been the focus of the IMF-induced moral hazard literature. Second, there is a need to explore whether domestic guarantees, explicit or implicit, attract international lending, especially in countries with imperfect contract enforcement and institutional stability.

Tables and Figures

Table 1. List of Sample Countries (by region)

Sub-Saharan Africa	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	East Asia and the Pacific
Angola	Albania	Argentina	Algeria	Bangladesh	China
Botswana	Bulgaria	Bolivia	Egypt	India	Indonesia
Burkina Faso	Czech Republic	Brazil	Iran	Pakistan	Korea, Rep.
Cameroon	Hungary	Chile	Jordan	Sri Lanka	Malaysia
Congo	Poland	Colombia	Lebanon		Myanmar
Cote D'Ivoire	Romania	Costa Rica	Morocco		Papua New Guinea
Ethiopia	Russia	Dominican Republic	Oman		Philippines
Gabon	Turkey	Ecuador	Syria		Thailand
Gambia, The		El-Salvador	Tunisia		Vietnam
Ghana		Guatemala	Yemen		
Guinea		Guyana			
Guinea-Bissau		Haiti			
Kenya		Honduras			
Liberia		Jamaica			
Madagascar		Mexico			
Malawi		Nicaragua			
Mali		Panama			
Mozambique		Paraguay			
Niger		Peru			
Nigeria		Trinidad and Tobago			
Senegal		Uruguay			
Sierra Leone		Venezuela			
Somalia					
South Africa					
Sudan					
Tanzania					
Togo					
Uganda					
Zambia					
Zimbabwe					

Notes: The regional distribution follows World Bank (2000 and 2001).

Table 2. Variables Definitions and Methodologies

Variable	Definition	Unit	Methodology and Source
Dependent Variables			
Level of International Debt			
TED	Total external debt	US\$ billion	GDF
Maturity of International Debt			
STFDTED	Short-term debt as percentage of total external debt.	Percentage	Calculated from GDF
LTDTED	Long-term debt as percentage of total debt.	Percentage	Calculated from GDF
Explanatory Variables			
Contract Enforcement and Institutional Stability Variables			
CONTRACT	Risk of contract repudiation by government	Index	ICRG
EXPROP	Risk of expropriation of private investment	Index	ICRG
CORRUP	Government corruption	Index	ICRG
LAW	Rule of law	Index	ICRG
BUREAU	Quality of bureaucracy	Index	ICRG
Other Explanatory Variables			
GDP	Nominal GDP	US\$ billion	WDI
GDPCAP	Log of Real GDP per capita	Units	GDP per capita is expressed in 1995 market prices
MGS	Imports of Goods and Services	US\$ billion	WDI
MMSGDP	Imports of Goods and Services as percentage of GDP		WDI
TEDGDP	Total external debt as percentage of GDP	Percentage	Calculated from GDF and WDI
CREDPRIV	Private sector credit as percentage of GDP	Percentage	WDI

Table 3. International Debt and Institutional Variables for Selected Countries, 1982-1997 Period Averages

International Debt				
Variable	Lowest Debt		Highest Debt	
	Country	Percentage	Country	Percentage
TEDGDP	Myanmar	0.0	Nicaragua	450.2
STFDTED	Botswana	1.5	Lebanon	59.5
LTD TED	Lebanon	40.5	Botswana	98.5

Contract Enforcement and Institutional Variables				
Variable	Lowest Risk		Highest Risk	
	Country	Score (Max=6)	Country	Score (Max=6)
CONTRACT	Czech Republic	5.4	Liberia	1.2
EXPROP	Czech Republic	5.9	Somalia	1.8
CORRUP	South Africa	5.3	Liberia	0.7
LAW	Czech Republic	5.8	Guinea-Bissau	1.0
BUREAU	South Africa	5.7	Haiti	0.9

Table 4. Correlation between International Debt, Contract Enforcement, and Institutional Stability Variables

	TED	STFDTED	LTD TED	CONTRACT	EXPROP	CORRUP	LAW	BUREAU
TED	1							
STFDTED	0.0989*	1						
LTD TED	-0.0334	-0.9132*	1					
CONTRACT	0.3277*	0.0492	0.0433	1				
EXPROP	0.3372*	-0.0142	0.0784*	0.8245*	1			
CORRUP	0.1401*	-0.0028	0.0918*	0.3620*	0.3840*	1		
LAW	0.2531*	-0.0147	0.0912*	0.5985*	0.6817*	0.5365*	1	
BUREAU	0.3315*	0.0204	0.0628*	0.5351*	0.5072*	0.5635*	0.5108*	1

Notes: * indicates significance at the 5 percent level.

Table 5 . Level of Debt and Contract Enforcement
Dependent Variable: TED

	Contract Enforcement		
	(1)	(2)	(3)
	CONTRACT	EXPROP	CORRUP
ENFORCEMENT	0.821** (0.271)	1.182*** (0.192)	0.996** (0.445)
GDP	0.085*** (0.015)	0.085*** (0.015)	0.087*** (0.0156)
GDPCAP	10.508* (6.207)	9.196 (6.026)	1.420** (5.974)
MGS	0.423*** (0.068)	0.414*** (0.068)	0.427*** (0.068)
CREDPRIV	0.062 (0.039)	0.067* (0.039)	0.060 (0.040)
N	1094	1094	1094
R ²	0.95	0.95	0.95

Notes: ENFORCEMENT refers to the contract enforcement variable. Fixed effects models estimation accounting for country-specific effects, as suggested by Hausman test. Standard deviations corrected for heteroscedasticity are in parentheses. Overall R² is reported. ***(**, *) significant at the 1 (5,10) percent level.

Table 6. Short-term Debt, Contract Enforcement, and Institutional Stability
Dependent Variable: STFDTED

	Contract Enforcement			Institutional Stability	
	(1) CONTRACT	(2) EXPROP	(3) CORRUP	(4) LAW	(5) BUREAU
ENFORCEMENT	-0.306*** (0.153)	-0.553*** (0.145)	-0.383** (0.162)		
STABLE				-0.397*** (0.127)	-0.041 (0.198)
GDPCAP	7.003*** (0.751)	7.208*** (0.769)	6.090*** (0.744)	6.538*** (0.672)	6.124*** (0.745)
MGS	0.159*** (0.024)	0.159*** (0.025)	0.160*** (0.024)	0.156*** (0.024)	0.162*** (0.025)
CREDPRIV	0.052*** (0.013)	0.053*** (0.013)	0.051*** (0.013)	0.058*** (0.013)	0.042*** (0.014)
TED	-0.059*** (0.017)	-0.057** (0.017)	-0.058*** (0.015)	-0.058*** (0.015)	-0.057*** (0.016)
N	1095	1095	1095	1095	1095
Chi-squared	254	251	213	254	210

Notes: ENFORCEMENT refers to the contract enforcement variable. STABLE refers to the institutional stability variable. Estimates are based on random effects models as suggested by Hausman test. Standard deviations corrected for heteroscedasticity and serial correlation are in parentheses. ***(**,*) significant at the 1 (5,10) percent level.

Table 7. Long-term Debt, Contract Enforcement, and Institutional Stability
 Dependent variable: LTDTED

	Contract Enforcement			Institutional Stability	
	(1) CONTRACT	(2) EXPROP	(3) CORRUP	(4) LAW	(5) BUREAU
CONTRACT	0.393** (0.176)	0.748*** (0.158)	0.347* (0.190)		
STABLE				0.469*** (0.150)	0.361 (0.234)
GDPCAP	-3.948*** (0.773)	-3.899*** (0.747)	-3.895*** (0.793)	-3.856*** (0.803)	-5.034*** (0.760)
MGS	-0.156*** (.027)	-0.165*** (0.027)	-0.152*** (.027)	-0.148*** (.025)	-0.160*** (.026)
CREDPRIV	-0.059*** (0.013)	-0.064*** (0.013)	-0.062*** (0.020)	-0.062*** (0.013)	-0.064*** (0.026)
TED	0.067*** (0.017)	0.067*** (0.016)	0.065*** (0.016)	0.067*** (0.015)	0.077*** (0.014)
N	1095	1095	1095	1095	1095
Chi-squared	133	148	136	113	1232

Notes: ENFORCEMENT refers to the contract enforcement variable. STABLE refers to the institutional stability variable. Estimates are based on random effects models as suggested by Hausman test. Standard deviations corrected for heteroscedasticity and serial correlation are in parentheses. ***(**,*) significant at the 1 (5,10) percent level.

Appendix

Appendix A Contract Enforcement and Institutional Stability Indicators

The risk of government repudiation of contracts indicates "the possibility that foreign businesses, contractors, and consultants face the risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down" due to "an income drop, budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities." The indicator ranges from 0 to 10 with lower scores signifying "a greater likelihood that a country will modify or repudiate a contract with a foreign business."

The risk of private investment expropriation variable evaluates the risk of "outright confiscation and forced nationalization" of property. The variable ranges from 0 to 10 with lower ratings "given to countries where expropriation of private foreign investment is a likely event."

The government corruption variable ranges from 0 to 6. Lower scores indicate that, "high government officials are likely to demand special payments" and that "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, police protection, or loans."

The rule of law variable "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes." The variable ranges from 0 to 6. Lower scores indicate "a tradition of depending on physical force or illegal means to settle claims." Upon changes in government new leaders "may be less likely to accept the obligations of the previous regime." Higher scores indicate "sound political institutions, a strong court system, and provisions for an orderly succession of power." The bureaucracy quality variable ranges from 0 to 6. High scores indicate "an established mechanism for recruitment and training," "autonomy from political pressure," and "strength and expertise to govern without drastic changes in policy or interruptions in government services" when governments change.

Appendix B

Table B1. International Debt and Institutional Variables, 1982-1997 Period Averages

Country	TEDGDP	STFDTED	LTDTED	CONTRACT	EXPROPRIATION	CORRUPTION	LAW	BUREAUACRACY
Albania	43.4	51.2	44.2	4.4	4.4	3.7	3.8	2.0
Algeria	50.1	6.2	91.7	3.8	4.1	3.4	2.2	2.4
Angola	125.6	12.6	87.4	2.6	3.5	3.0	1.7	2.9
Argentina	45.9	17.6	77.9	3.2	3.8	3.5	3.5	3.0
Bangladesh	39.7	1.5	92.3	2.7	3.2	0.8	1.6	1.3
Bolivia	103.6	7.8	87.7	3.0	3.4	1.9	1.6	1.3
Botswana	18.5	1.5	98.5	4.2	4.8	3.7	4.9	3.6
Brazil	33.7	16.0	82.3	4.0	4.7	3.7	3.7	4.0
Bulgaria	60.0	6.2	90.9	4.1	5.4	3.9	5.0	3.0
Burkina Faso	40.5	7.0	90.5	3.1	2.9	3.5	3.3	2.4
Cameroon	62.2	13.8	85.2	3.7	3.9	2.6	2.8	3.8
Chile	71.2	17.1	79.2	4.3	4.7	3.3	4.3	3.4
China	12.7	24.2	73.8	4.1	4.9	3.7	3.8	3.1
Colombia	31.6	17.3	82.7	4.3	4.4	2.9	1.4	3.9
Congo, Rep.	185.3	15.3	84.3	2.8	3.1	3.0	2.3	2.0
Costa Rica	81.1	11.6	86.3	3.6	4.2	5.0	4.0	2.9
Cote d'Ivoire	155.4	16.7	79.4	3.8	4.2	3.1	3.3	4.0
Czech Republic	21.1	44.2	53.4	5.4	5.9	4.1	5.8	4.0
Dominican Republic	49.4	13.2	82.3	2.4	3.8	3.1	3.3	3.0
Ecuador	85.9	15.5	82.3	3.3	4.1	3.2	4.0	3.0
Egypt, Arab Rep.	87.3	12.7	86.8	4.0	4.1	2.3	2.7	2.7
El Salvador	40.7	10.5	87.3	3.1	3.1	2.4	1.7	1.2
Ethiopia	124.4	2.7	96.0	3.0	3.6	2.6	2.9	1.2
Gabon	65.9	17.3	80.6	4.1	4.5	1.6	2.5	3.7
Gambia, The	117.9	7.7	81.9	3.2	5.0	3.1	3.9	2.5
Ghana	67.1	8.6	73.3	3.7	3.7	2.6	2.1	2.9
Guatemala	29.0	13.8	83.6	3.2	3.1	2.2	1.6	1.2
Guinea	88.6	6.7	90.9	2.7	4.0	3.5	3.0	1.9
Guinea-Bissau	278.6	9.7	89.4	2.4	2.8	2.0	1.0	2.0
Guyana	375.9	18.5	73.9	3.5	3.6	1.5	1.7	1.4
Haiti	33.9	9.8	82.9	2.0	2.5	1.0	1.3	0.9
Honduras	95.4	8.7	88.2	3.2	3.2	2.0	2.2	1.6
Hungary	63.0	17.1	78.9	4.6	5.4	4.6	5.2	4.2
India	23.5	8.3	85.3	3.9	4.8	2.8	2.7	3.8
Indonesia	54.3	17.4	82.0	3.9	4.5	1.5	2.7	1.7
Iran, Islamic Rep.	11.8	58.0	42.0	3.1	2.8	3.1	2.6	2.5
Jamaica	124.0	8.2	80.9	4.1	4.2	2.3	2.2	3.1
Jordan	119.6	13.8	84.6	3.2	3.9	3.4	2.9	3.0
Kenya	77.3	10.4	81.9	3.6	3.8	2.9	3.4	3.7
Korea, Rep.	27.8	32.5	65.8	5.3	5.1	3.3	3.3	4.3
Lebanon	33.0	59.5	40.5	2.9	3.2	2.5	2.0	1.9
Liberia	118.7	20.1	61.8	1.2	2.3	0.7	1.5	1.0
Madagascar	112.6	7.1	88.2	1.9	2.8	4.0	3.3	2.6
Malawi	98.6	4.3	87.4	3.3	4.1	3.7	2.4	2.1
Malaysia	49.4	17.0	82.6	4.6	4.9	4.4	4.2	3.6

Table B1. International Debt and Institutional Variables, 1982-1997 Period Averages (continued)

Country	TEDGDP	STFDTED	LTDTED	CONTRACT	EXPROPRIATION	CORRUPTION	LAW	BUREAUACRACY
Mali	106.1	3.2	92.2	1.9	2.4	1.9	2.4	1.0
Mexico	48.1	15.9	79.5	4.2	4.5	2.8	3.2	2.9
Morocco	87.2	3.5	92.6	3.6	4.0	2.5	3.1	2.9
Mozambique	172.4	4.9	93.6	3.2	4.1	4.0	2.4	3.1
Myanmar	0.0	4.3	94.1	2.5	3.6	1.8	2.8	1.3
Nicaragua	450.2	16.9	82.9	3.1	3.2	4.5	2.3	1.8
Niger	73.5	6.4	88.8	3.2	3.3	3.2	2.9	3.0
Nigeria	99.2	14.6	85.4	2.9	3.2	1.9	1.8	2.4
Oman	26.6	17.8	82.2	4.3	4.4	3.0	4.0	3.4
Pakistan	46.7	11.2	82.0	3.3	3.7	1.9	2.1	2.7
Panama	96.1	28.3	67.8	3.3	3.6	2.1	2.2	1.2
Papua New Guinea	68.3	5.6	92.7	4.2	4.6	3.0	3.4	4.0
Paraguay	37.3	17.4	82.6	4.6	4.1	1.4	2.7	1.8
Peru	62.3	21.8	73.9	3.1	3.7	2.9	1.7	2.1
Philippines	69.7	22.0	74.7	3.2	3.5	1.8	2.0	1.7
Poland	47.3	12.9	86.5	3.8	4.7	4.5	4.7	3.2
Romania	14.6	24.2	62.6	3.4	4.5	3.0	3.3	1.6
Russian Federation	23.5	14.0	83.8	4.2	5.1	3.5	3.0	3.1
Senegal	80.0	8.6	82.3	3.1	3.6	3.0	2.1	3.0
Sierra Leone	111.9	29.9	58.6	2.3	3.4	1.7	2.7	2.1
Somalia	197.4	11.9	81.0	1.6	1.8	2.8	2.1	1.5
South Africa	17.0	39.7	57.1	4.5	4.4	5.3	2.6	5.7
Sri Lanka	63.8	6.8	84.3	3.5	3.9	3.1	1.6	3.0
Sudan	133.5	25.1	67.9	1.7	2.4	1.8	1.9	1.4
Syrian Arab Republic	116.4	14.6	85.4	3.2	3.2	2.5	2.7	2.2
Tanzania	136.6	18.3	79.5	3.6	4.1	3.2	3.7	1.4
Thailand	43.1	29.4	67.9	4.6	4.6	3.1	4.0	4.4
Togo	102.3	8.6	85.0	3.0	3.9	2.0	2.2	2.0
Trinidad and Tobago	38.4	13.2	82.5	4.1	4.4	2.6	4.0	3.1
Tunisia	59.7	7.4	90.3	3.6	3.9	3.0	3.0	3.0
Turkey	39.7	18.0	79.7	3.8	4.4	2.9	3.3	3.4
Uganda	56.1	3.9	79.1	2.8	2.9	2.3	1.9	1.4
Uruguay	48.5	22.2	73.7	4.5	4.2	3.0	3.0	2.2
Venezuela, RB	57.8	15.7	80.5	3.9	4.3	2.8	3.8	2.9
Vietnam	132.3	5.8	84.5	3.1	4.2	2.7	3.6	2.2
Yemen, Rep.	132.4	12.4	86.5	3.7	4.1	2.5	2.3	2.1
Zambia	195.6	15.5	69.0	2.3	4.0	2.4	2.5	1.8
Zimbabwe	45.8	15.9	78.0	3.2	3.6	3.2	2.5	3.5
	85.4	15.0	80.7	3.4	3.9	2.8	2.8	2.6

Figure 1
Optimal Investment Strategy

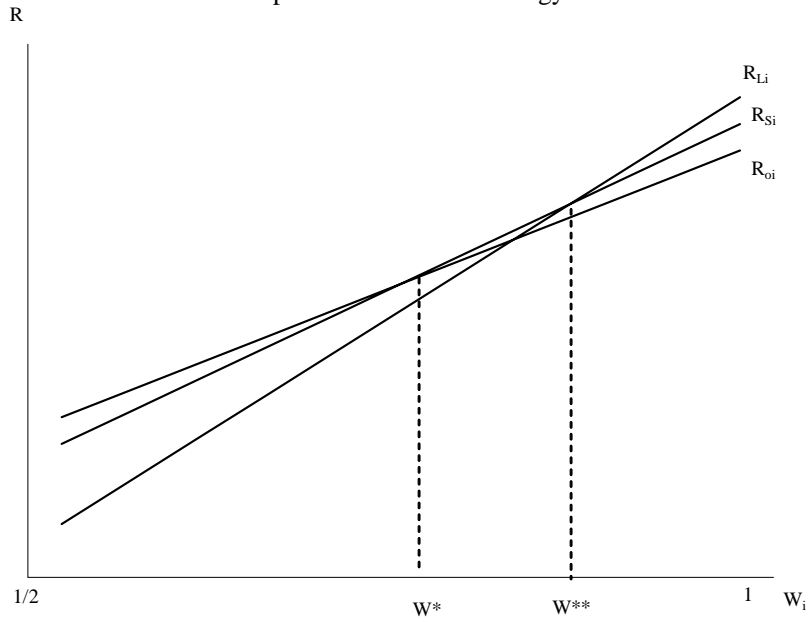
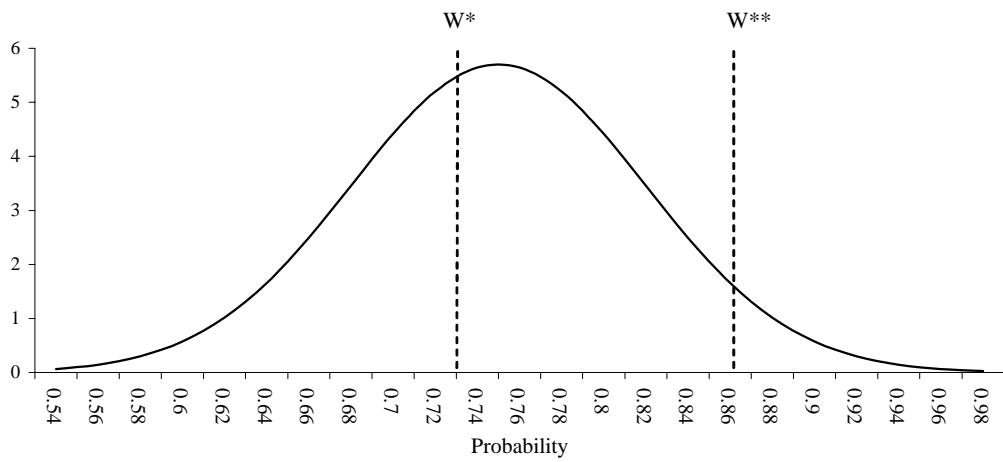


Figure 2
The Volume and Maturity of International Loans



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