How does private foreign borrowing affect the risk of sovereign default in developing countries?

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Abstract

We argue that increased foreign borrowing by the private sector reduces the risk that a developing country's government defaults on its foreign debt. We present a simple model in which private foreign borrowing reflects a surge of private entrepreneurship. A larger "entrepreneurial class" raises the political costs of default and reduces the government's incentive to deny repayment. The results of our empirical analysis support the model's key hypothesis.

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1 Introduction

For a long time, debt-creating capital flows to emerging markets and developing countries used to be dominated by government borrowing. However, this dominance has steadily vanished in recent years: while in 1990 the public sector still accounted for 84 percent of all foreign loans disbursed to countries covered by the World Bank's *Global Development Finance*, this share amounted to a mere 38 percent in 2004 (see Figure 1). Of course, these average figures mask a substantial degree of cross-country heterogeneity: in 2004, private borrowing was many times higher than public borrowing in emerging economies like Chile or Thailand, but in numerous low-income countries the privilege to access international capital markets is still reserved to the government.

In this paper, we investigate the consequences of private foreign borrowing for sovereign creditworthiness. The prevailing belief is that private external borrowing contributes to higher sovereign risk. This belief is based on the notion that large-scale private borrowing creates vulnerabilities that may eventually lead to financial crises. The public sector may be forced to assume at least part of private debt, and the real exchange rate depreciation associated with a "sudden stop" may cause debt-service difficulties for the government. Following this logic, both *private* and *public* external debt pose a threat to external fiscal sustainability.[1] By contrast, we advance a political economy argument which suggests that a larger amount of private external debt is likely to *enhance* sovereign cred-

[1]The view that governments bail out the private sector is supported by anecdotal evidence on private debt nationalizations after currency and financial crises. For instance Reinhart (2002) states that "Even if the government itself has little outstanding debt, history has shown that, time after time, governments assume private sector debt during currency crises." Note, however, that most of the studies which find a negative association of sovereign ratings with the overall amount of external debt (see, e.g., Cantor and Packer (1996),Haque et al. (1996), Harms and Rauber (2006)) are based on sample periods in which public debt constituted the bulk of total external debt.

itworthiness. We claim that governments have a lower incentive to default on their foreign debt if the private sector is more exposed to international capital markets. Our key argument runs as follows: public borrowing eventually leads to repayment obligations which force the government to raise taxes. Without a countervailing force, a government that maximizes its political support among the domestic population is tempted to deny repayment. We argue that private-sector access to international capital markets creates such a countervailing force, i.e. it generates a class of agents who are vulnerable to the sanctions and disruptions resulting from government default. As the size and stake of this group increases, the attractiveness of sovereign default declines.

To present this argument in a transparent fashion and to get some guidance for the specification of our empirical tests, we develop a simple political-economy model in which the extent of private foreign borrowing determines the size of an economy's "entrepreneurial class", i.e. the number of agents who invest in new firms and hire workers to reap the profits and capital gains associated with firm ownership. Public borrowing is exogenous, and a share of disbursed loans is allocated to infrastructure projects which raise total factor productivity. At the end of each period, the government decides between repayment and default, taking into account the interests of workers and entrepreneurs. While workers unambiguously support default because they prefer a lower tax burden, entrepreneurs anticipate that the value of their firms drops in case of default and thus support repayment. The larger the entrepreneurial class, i.e. the larger the volume of private foreign borrowing, the greater the likelihood that the political costs of default exceed its benefits, and the higher the likelihood of repayment.

Having developed our main hypothesis - namely, that private foreign borrowing reduces the risk of sovereign default - we test it by using data on country creditworthiness, the composition of foreign borrowing, and a broad set of control variables. A first impression of the relationship between private foreign borrowing and sovereign risk is provided by Figure 2, which plots the *Institutional Investor's*

measure of country creditworthiness ($IICCR$) against the average value of private foreign borrowing relative to GNI (in percentage terms). The correlation is strongly positive, even if we remove the three observations for which private foreign borrowing and creditworthiness was particularly high.[2] But, of course, this is no proof of the causal relationship suggested above. Instead, the scatterplot may merely illustrate that lower sovereign risk encourages private foreign borrowing.[3] Further evidence in favor of our hypothesis is provided by Figure 3: the top panels plot the cross-country averages of private and public foreign debt (as a share of GNI) before and after increases of *Moody's* sovereign ratings (at $t = 0$) which were not preceded by rating changes in the previous three years.[4] The bottom panels do the same for private and public foreign *borrowing*: notably, private debt and borrowing are on the rise while public debt and borrowing are declining prior to a rating increase, indicating that, on average, increases in private debt and borrowing *preceded* improvements of country creditworthiness. Again, however, this dynamic pattern does not necessarily prove causality – especially since other factors that influence borrowing behavior and perceived sovereign risk are not taken into account.

The key challenge we face in testing the model is therefore to come to terms with the simultaneity of both private borrowing and sovereign risk and to control for other factors that might have an impact on these variables. Using a host of alternative empirical approaches and specifications, we demonstrate that the data support our hypothesis: exogenous shifts in the volume of private foreign

[2]The data points refer to five-year averages between 1980 and 2004. The three extreme observations are Hungary, Estonia and Kazakhstan between 2000 and 2004.

[3]Several papers (Durbin and Ng (2005), Borensztein et al. (2006a), Borensztein et al. (2006b)) document that governments' credit-ratings influence private borrowing by constituting a ceiling for the credit ratings of most private entities.

[4]By focusing on rating increases that were preceded by long periods of stable creditworthiness assessments, we are reducing the likelihood that changes in private and public debt just reflect past rating increases.

borrowing (relative to GNI) have a significant impact on a government's perceived creditworthiness.

The rest of the paper is structured as follows: the next section offers a brief review of the relevant literature and highlights our own contribution. Section 3 presents the theoretical model. Section 4 introduces our empirical specification, the data we use, and comments on the results. Section 5 summarizes and concludes. Detailed information on data definitions and sources are given in the data appendix.

2 Review of the Literature

There is a rich literature on the causes and consequences of sovereign risk. In the absence of a supra-national enforcement institution, the incentive to repay crucially hinges on the sanctions a government faces in case of default. These sanctions can be subdivided into two main types: starting with Eaton and Gersovitz (1981), it has been argued that governments avoid default in order to preserve access to future loans. However, this idea was criticized by Bulow and Rogoff (1989) who demonstrate that a sovereign debtor can achieve a higher welfare level by denying repayment and by investing the outstanding amount in a third country. Hence, unless it is possible to exclude countries from financial markets both as debtors *and* as creditors, only the threat of direct sanctions – including negative "reputation spillovers" (Cole and Kehoe (1997)) – is effective to enforce repayment.[5]

While the notion that defaulting governments are shut off from international capital markets gets mixed empirical support (see Eichengreen and Lindert (1989), Gelos et al. (2003) and Miller et al. (2006)), there is ample evidence that a debt crisis imposes large costs on the economy: Rose (2005) demonstrates that

[5]An authoritative survey of this discussion is provided by Eaton and Fernandez (1995).

the volume of trade is reduced by as much as eight percent for a considerable time span after a sovereign default. And Arteta and Hale (2005, 2006) show that private firms find it much harder to access international credit markets once government creditworthiness has plummeted.

It is quite obvious that the costs of default do not affect all citizens of a country in a symmetric fashion. In fact, there is strong evidence that "political factors" - e.g. the proximity of elections or the characteristics of the instititutional environment - have a significant effect on countries' perceived creditworthiness and the likelihood of default.[6] Nevertheless, there are few studies that explicitly consider the distributional effects of debt crises and agents' conflicting interests with respect to sovereign default. Two notable contributions in this spirit are Tomz (2002) and Saiegh (2005). In his paper, Tomz offers a careful analysis of the shift in popular attitude that preceded the Argentine default of 2001. Saiegh sketches a model which is based on the Eaton/Gersovitz (1981) assumption that countries are denied access to international capital markets after a default: since agents differ in their ownership of productive assets, the net benefits from default are distributed unevenly across the population. Whether the government defaults is thus a matter of group size and political influence.[7]

The original contribution of our paper is to highlight one kind of distributional conflict that we consider particularly relevant for a government's default decision - namely, the conflict between an "entrepreneurial class" whose fortunes are closely linked to the government's treatment of foreign lenders, and the large group of

[6]See, e.g., Manasse et al. (2003), Van Rijckeghem and Weder (2004), Block and Vaaler (2004).

[7]Amador (2002) highlights another channel through which political considerations enter a government's default decision: if parties alternate in power, their ability to implement the Bulow/Rogoff (1989) investment scheme is limited by the incentive to overconsume. In a world in which defaulting countries face an embargo by international investors, the incumbent government may therefore choose repayment.

workers for whom the costs of default are negligible. To the best of our knowledge, none of the existing empirical studies on sovereign ratings (see,e.g.,Cantor and Packer (1996), Haque et al. (1996), Harms and Rauber (2006)) explores the potentially different impact of public and private external debt. By contrast, there is a growing number of studies that explore how sovereign creditworthiness and default affect the access of the private sector to external credit.[8] An analysis of how the costs inflicted on the private sector shape the political support for debt repayment enhances our understanding of sovereign default and improves our assessment of governments' creditworthiness.

3 A simple model of international borrowing and default risk

3.1 Structure and assumptions

We consider a small open economy where firms produce a tradable good whose price is normalized to one. There is a large number of risk-neutral, ex-ante identical agents with total mass one. Agents live for one period and leave no bequests.

At the beginning of every period, the government borrows an exogenous amount G at the gross interest rate R^G. A share ϕ of government borrowing is used productively while $(1-\phi)G$ is consumed by the government. We assume that there are no domestic savings, hence all borrowing – public and private – is *international* borrowing. At the end of the period, the government decides

[8] See, e.g., Arteta and Hale (2006), Durbin and Ng (2005), Borensztein et al. (2006a), Borensztein et al. (2006b). Jeske (2006) models the default incentives of private and public borrowers and concludes that the externalities associated with non-regulated private borrowing warrant a control of international capital flows. However, he does not consider the impact of private borrowing on the likelihood of government default.

whether to pay back the loan or to default. We denote the likelihood of repayment by q.

International capital markets are populated by risk-neutral investors who have access to an asset which pays the risk-free interest rate R^W. It follows that the interest rate paid by the domestic government (R^G) has to satisfy $qR^G = R^W$. In case of default in period t, the government is shut off from international capital markets in period $t+1$, hence $G_{t+1} = 0$. If the government does *not* default, it has to raise taxes $T = R^G G$ to finance principal and interest payments. We assume that the tax burden is the same for all agents in the economy.

The representative firm uses the following technology:

$$Y_i = \theta_i \phi G L_i^{\alpha}. \tag{1}$$

In (1), Y_i is the firm's revenue, L_i is the amount of labor employed by firm i, and θ_i is an idiosyncratic productivity shock with two realizations: $\theta_i \in \{0, 1\}$. Productivity shocks are identically and independently distributed across firms and time, and the probability that $\theta_i = 1$, i.e. that a firm is "successful" in a given period, is p. As a consequence, a share p of firms is able to produce positive output while the rest goes out of business. If the government is unable to finance its expenditure ($G = 0$) agents have access to an alternative linear production technology whose output we normalize to zero.

Once government spending has been determined, agents decide whether to become *entrepreneurs* or *workers*.[9] An entrepreneur sets up a firm before θ_i is realized. We assume that setting up a firm requires a fixed investment K. Since agents are born without an endowment, they have to borrow this amount on the international capital market. The interest rate an entrepreneur has to pay to foreign creditors is denoted by R^P. If the entrepreneur is "successful", i.e. if $\theta_i =$

[9]This part of the model is reminiscent to Harms and Zink (2005).

1, she hires workers, pays wages as well as interest and principal on her loan, and retains the rest. At the end of the period, she sells the firm to an entrepreneur of the next cohort at a price V_i. If the entrepreneur fails – i.e. if $\theta_i = 0$ – she becomes a worker. To allow for varying degrees of contract enforceability, we introduce the parameter $\gamma \in [0, 1]$ and assume that, in case of failure, international creditors get hold of the amount $\gamma R^P K$.[10] In the extreme case of $\gamma = 1$, private contracts are perfectly enforceable across national boundaries. Conversely, if $\gamma = 0$, a failed entrepreneur who declares "private default" is able to abscond completely, and the foreign creditor has to write off the entire loan. It follows that R^P is given by

$$R^P = \frac{R^W}{p + (1-p)\gamma}. \tag{2}$$

We assume that the effective costs of a loan also depend on the quality of the "financial infrastructure", i.e. on the degree of competition in the financial sector, the extent of government regulation etc. These aspects are captured by the parameter c, which decreases in the quality of the financial infrastructure. Note that, by allowing c to differ across countries and time periods, we introduce a parameter which potentially influences private borrowing without being affected by the likelihood of default. This will turn out to be extremely useful in the empirical analysis.

3.2 Entrepreneurs and workers

Given our assumptions, the expected utility of an entrepreneur can be written as follows:

[10] We assume that successful entrepreneurs comply with their repayment obligations.

$$\begin{aligned} \mathrm{E}[U_i^e] &= p[q(\pi_i - R^P K - c - T + V_i^{ND}) + (1-q)(\pi_i - R^P K - c + V_i^D)] \\ &\quad +(1-p)[q(w - T - c - \gamma R^P K) + (1-q)(w - c - \gamma R^P K)], \end{aligned} \tag{3}$$

where π_i is revenue minus wages, w is the real wage, V_i^{ND} is the value of the firm if the government honors its international debt, and V_i^D is the firm value in case of default. Given our assumption that setting up a firm requires an initial investment of K and that $G_{t+1} = 0$ if the government defaults in period t, it is straightforward to show that $V_i^{ND} = K$ and $V_i^D = 0$: if the government keeps supplying productive infrastructure, aging (successful) entrepreneurs meet the perfectly elastic demand of future entrepreneurs who are willing to pay the price K, i.e. exactly the sum it would take to set up a *new* firm. In case of default, production dies down, and there is no subsequent entrepreneurial class willing to purchase old firms.

Using this result, we can reformulate (3) to get

$$\mathrm{E}[U_i^e] = p[\pi_i - (1 + \gamma\frac{1-p}{p})R^P K] - c + (1-p)w - q(R^G G - pK). \tag{4}$$

Note that the last term in brackets succinctly illustrates entrepreneurs' attitude towards public default: on the one hand, a defaulting government does not raise taxes which allows for higher consumption. On the other hand, government default destroys firm value, and this hurts successful entrepreneurs.

The number of entrepreneurs n^* is determined by a equilibrium condition which guarantees that the expected utility of becoming a – potentially failed – entrepreneur equals the expected utility of abstaining from international capital markets:

$$p[\pi_i - (1+\gamma\frac{1-p}{p})R^P K + qK] - c - qR^G G + (1-p)w = w - qR^G G, \qquad (5)$$

where the RHS gives expected utility of an agent who does not borrow. The technology given by (1) and the assumption that labor markets are perfectly competitive imply that

$$\pi_i = (1-\alpha)\phi G L_i^{\alpha}, \qquad (6)$$

$$w = \alpha\phi G L_i^{(\alpha-1)}, \qquad (7)$$

In a symmetric equilibrium, the number of workers per firm is given by the number of agents who decided not to borrow plus the number of *failed* entrepreneurs, divided by the number of *successful* entrepreneurs. Denoting the number of successful entrepreneurs by $m = np$, this means

$$L_i = \frac{1-m}{m}, \qquad (8)$$

Using equations (6) – (8) as well as (2), we can simplify (5) to get

$$(1-\alpha)\left(\frac{1-m}{m}\right)^{\alpha} - \frac{1}{\phi G}\left(\frac{R^W}{p}K - qK + \frac{c}{p}\right) = \alpha\left(\frac{1-m}{m}\right)^{(\alpha-1)}. \qquad (9)$$

Figure 4 demonstrates how the equilibrium number of entrepreneurs n^* is determined for given values of q and G: the LHS of (9) is upward-sloping in $(1-m)/m$, with the intercept given by $\frac{-1}{\phi G}\left(\frac{R^W}{p}K - qK + \frac{c}{p}\right)$. Conversely, the RHS is downward-sloping. The point of intersection gives the equilibrium number of workers per firm. The lower quadrant shows how to translate this value into the equilibrium number of successful entrepreneurs m^*. Dividing m^* by p yields the equilibrium number of agents who set up firms, n^*. Accordingly, the volume of *private foreign borrowing* is given by n^*K.

3.3 Comparative statics

It follows from (9) that raising ϕG has a positive effect on m^* whereas raising c or R^W lowers the equilibrium number of successful entrepreneurs. For a given value of p, this translates into a higher (lower) volume of private foreign borrowing.

Raising the likelihood of entrepreneurial success p increases m^*. However, the effect on foreign borrowing $n^*K = m^*K/p$ is ambiguous. The economic explanation for this result runs as follows: on the one hand, a higher likelihood of entrepreneurial success reduces the effective costs of borrowing. On the other hand, however, a higher share of "surviving" entrepreneurs reduces the number of workers per firm and thus squeezes expected profits. While raising p may thus actually lower the volume of private foreign borrowing, the effect on R^P is unambiguous: obviously, a higher value of p results in a lower interest rate.

The parameter γ, which captures the enforceability of private contracts, does not affect agents' entrepreneurial decisions: a lower value of γ raises the interest rate R^P. At the same time, it lowers the expected interest burden for entrepreneurs. In equilibrium, both effects cancel out.

Finally, it follows from (9) that increasing q raises m^* and n^*: A higher likelihood that the government will honor its debt and will be able to finance public infrastructure in the next period raises the expected value of a firm and thus

makes it more attractive to become an entrepreneur. This relationship is depicted by the function $m^*(q)$ in Figure 5. Note that $m^*(0) > 0$ and $m^*(1) < 1$: even if the government defaults for sure, current profits are strictly positive and the supply of entrepreneurs does not completely dry out. Conversely, diminishing returns to labor make sure that some agents will decide not to become entrepreneurs even if $q = 1$.

3.4 The government's default decision

When deciding whether to default on its debt, the government maximizes its "political support", i.e. a weighted sum of domestic agents' utility, with the weights ω and $(1 - \omega)$ reflecting the political impact of successful entrepreneurs and workers, respectively. Moreover, the government takes into account the (economic and reputational) costs of default. These costs are represented by the variable ρ which is defined on the support $[-\infty, +\infty]$ with distribution function F. The fact that the costs ρ may become *negative* is meant to reflect other exogenous political and economic shocks that possibly induce the government to discriminate against foreign creditors. Given these assumptions, we can state that a default takes place if the following condition is satisfied:

$$\rho < (1 - \omega)(1 - m)R^G G + \omega m(R^G G - K) \tag{10}$$

The first term on the right hand side reflects workers' interests, who unambiguously benefit from a default. The second term reflects the position of (successful) entrepreneurs who are torn between the appeal of lower taxation and the desire to protect their capital gains.

The inequality in (10) implies that the government chooses to repay its debt

if the costs of default exceed a threshold value $\hat{\rho}$ which is given by

$$\hat{\rho} = R^G G - \omega m K. \tag{11}$$

Conversely, the government defaults if $\rho < \hat{\rho}$. The likelihood of repayment is thus given by $q = 1 - F(\hat{\rho})$.

Recall that the interest rate R^G charged by international investors is R^W/q and that m denotes the number of successful entrepreneurs. The equilibrium likelihood of repayment is thus implicitly given by

$$q^* = 1 - F\left(\frac{R^W G}{q^*} - \omega m K\right). \tag{12}$$

In what follows, we *assume* that (12) has a unique solution, as illustrated in Figure 6.[11] Obviously, q^* decreases in G and increases in m. The latter relationship reflects the fact that, with m increasing, the "capital costs" of default get a larger weight in the government's objective function, making it less attractive to default. This effect is magnified by a multiplier-like process, through which a higher level of q lowers R^G, which further increases q etc. The relationship between m and the likelihood of repayment is depicted by the line $q^*(m)$ in Figure 7. Note that $q^*(0) > 0$: even if there are no entrepreneurs, the costs of default may be high enough to induce the government to repay its debt. Conversely, $q^*(1) < 1$: even if all agents are entrepreneurs, other shocks may be strong enough to trigger default.

[11] Without this assumption, and without imposing more structure on the function F, we would have to allow for the possibility that there are multiple solutions to (12) or no solution at all.

3.5 Comparative static properties of the equilibrium

In Figure 7, the equilibrium values m^{eq} and q^{eq} are given by the intersection of the two lines $m^*(q)$ and $q^*(m)$, i.e. by the joint solution of equations (9) and (12). The fact that $q^*(0) > 0$, $q^*(1) < 1$, $m^*(0) > 0$, $m^*(1) < 1$ guarantees that $m^*(q)$ cuts $q^*(m)$ from below.

How does this equilibrium react to changes in the exogenous variables? Improving the financial infrastructure, i.e. lowering c shifts the $m^*(q)$ curve to the right: reducing the costs of borrowing makes it more attractive to set up a firm for a given value of q, raising $m^*(q)$. The greater number of successful entrepreneurs, in turn, makes it less attractive to default and raises q. As a result, both m^{eq} and q^{eq} increase: foreign lending by private agents increases, and this development is accompanied by an improving creditworthiness of the domestic government. In a similar fashion, raising the productive share of government spending ϕ increases m^{eq} and q^{eq}. Note, however, that raising the total volume of G has an ambiguous effect on m^{eq} and q^{eq} since, for a given value of ϕ, increasing G raises the attractiveness of becoming an entrepreneur, but also the tax burden and thus the incentive to default. Finally, raising p, the likelihood of entrepreneurial success, increases both m^{eq} and q^{eq} by shifting the $m^*(q)$-curve to the right.

3.6 Discussion

While we modeled the private costs of sovereign default as resulting from a contraction of public borrowing and the associated breakdown in productivity-enhancing infrastructure services, we would like to point out that our theoretical framework allows for a wide array of alternative interpretations: capital losses could, e.g., result from restricted private-sector access to international lending as documented by Arteta and Hale (2006). If economic activity hinges on the availability of international credit, the consequences of government default would be the same as in our model.

Moreover, sovereign default is often associated with a massive depreciation of the domestic currency. If private sector loans are denominated in foreign currency and if goods prices do not adjust immediately, such a depreciation has a dramatic effect on firms' profitability. This is another channel through which public default generates costs for private debtors.

Hence, we do not claim that our model highlights the *only* channel through which sovereign default inflicts costs on the private sector. We do, however, believe that our theoretical framework conveys the gist of our argument, namely that private foreign borrowing results in growing opposition against government default. Endowed with this hypothesis, we turn to the empirical analysis.

4 Empirical analysis

4.1 Model specification

The central claim of this paper is that an increase of *private* foreign borrowing in developing countries reflects the emergence of an "entrepreneurial class" which is hurt by the consequences of government default. These losses are taken into account by support-maximizing politicians and may thus raise the likelihood that the government meets its repayment obligations. An exogenous shift in private borrowing should thus raise sovereign creditworthiness.

The rest of the paper will be devoted to estimating variants of the following equation:

$$q_{it} = \beta_n n_{it} + \beta_G G_{it} + \sum_{k=1}^{K} \gamma_k \; x_{k,it} + \xi_t + \varepsilon_{it} \tag{13}$$

,

where q_{it} is a proxy for sovereign creditworthiness in country i at time t, n_{it} and G_{it} reflect private and public foreign borrowing, respectively, $x_{k,it}$ are control variables, ξ_t are time dummies and ε_{it} the usual error term.

The key hypothesis we want to test is that β_n is positive. However, this is complicated by the fact that – as illustrated by equation (9) – private foreign borrowing is a function of sovereign risk: a higher likelihood of public default reduces the expected return on entrepreneurial activity and thus reduces the incentive to borrow abroad. Estimating (13) by OLS would therefore produce biased parameter estimates. Fortunately, however, our theoretical model suggests a number of "shift parameters" which we can use as instruments to identify β_n: most importantly, we will use proxies for c (the costs of borrowing), ϕ (the share of public loans that are used productively) and p (the likelihood of entrepreneurial success). Exogenous variations in these variables result in variations of private borrowing which are not due to changes in government creditworthiness.

4.2 Data

We proceed by introducing the proxies and control variables we use to estimate (13): To capture the likelihood of public debt repayment (q), we use the *Institutional Investor*'s rating of country creditworthiness ($IICCR$). The IICCR ranks countries on a scale from 0 to 100, with a lower rating reflecting a higher likelihood that borrowers in this country will default on their debt. The ratings are "...based on information provided by senior economists and sovereign risk analysts at leading global banks and money management and securities firms" (Institutional Investor, 2002:170) and have been published twice per year since 1979.[12]

The advantage of the $IICCR$ is its large country coverage and its regular frequency. Although it does not exclusively refer to the likelihood of *government* default, we conjecture that *sovereign risk* makes up for a large share of "country

[12]As reported by Haque et al. (1996), the individual criteria used by banks to assess default risk are not specified. Hence, we have no information on whether observed aid flows directly enter the ratings.

creditworthiness". Our conjecture is confirmed by comparing the *Institutional Investor* rating to ratings which explicitly focus on government creditworthiness, but cover a smaller number of countries and years.[13]

The variables reflecting private and public foreign borrowing are taken from the World Bank's *Global Development Finance* database: n is proxied by the volume of "private non-guaranteed loans disbursed", divided by the country's GNI in the same year ($PRIVLOANS$). We believe that "loans disbursed" are a closer analogue to n than, e.g., "net flows" (loans disbursed minus principal repayments) or "net transfers" (net flows minus interest payments) since they represent foreign borrowing in the current period, and are not affected by *past* capital inflows. To operationalize G, we use the volume of "public and publicly guaranteed loans disbursed", also divided by GNI ($PUBLOANS$). Note that we do not distinguish between different *sources* of loans. That is, public borrowing comprises both loans of international institutions and loans of private investors. In the later part of the paper, we will check whether our key findings are robust to the use of alternative proxies for n and G.

As described above, private borrowing increases in the quality of the financial infrastructure, which is reflected by the variable c. As a proxy for (the inverse of) c, we use the *Fraser Institute*'s measure of credit market regulation ($CREDREG$). This index, which is defined on a scale from zero to ten – with higher variables reflecting a *more favorable* regulatory environment – captures the administrative hurdles and entry barriers that raise the costs of borrowing. Among the criteria that enter this index is the degree of competition faced by domestic banks, the presence of interest rate controls etc. The Fraser Institute has been publishing this index every five years between 1970 and 2000. Since 2001 the index is available on an annual basis.

[13]The rank correlation between the $IICCR$ and the sovereign ratings published by *Moody's* in the 1990s is 0.92. The rank-correlation with the sovereign ratings of *FitchRatings* is 0.85.

The fact that we do not have annual data for the credit regulation index during the 1980s and 1990s determines the frequency of our data set: The variables used in our regressions will either be five-year averages (1980-84, 1985-1989, 1990-1994, 1995-1999, 2000-2004), or initial values of the respective five-year periods. We use the initial level of credit market regulation, but average values of the IICCR, private borrowing and public borrowing.

To capture the share of government borrowing that is used productively (ϕ), we need a measure of "governance". Indices which measure the "quality of institutions" have mushroomed in recent years (see, e.g., Kaufmann et al. (2006)). Unfortunately, however, few of them are available for the entire time span we consider, i.e. the years 1980 to 2004. We therefore use the squared distance from the equator ($LATITUDE$) as a proxy, referring to the argument of, e.g., Acemoglu et al. (2001), Easterly and Levine (2003) and Rodrik et al (2004) that geographical and climatic factors play an important role in shaping the quality of institutions. In addition, we conjecture that governments which face less constitutional constraints are more likely to squander the means borrowed abroad, and use five-year-averages of the Freedom House (2006) measure of political rights ($POLREPRESS$) as a second proxy for ϕ. This index is defined on a scale between 1 and 7, with higher values reflecting a higher degree of political *repression*.

The hardest task is to find an instrument which captures the likelihood of entrepreneurial success. Arguing that more favorable terms of trade improve business prospects – especially in economies which are strongly dependent on agricultural and raw materials exports – we use the lagged five-year average of the terms of trade ($TOT(-1)$) as a proxy for p.

Concerning the control variables, we follow the studies of Haque et al. (1996) as well as Harms and Rauber (2006). First and foremost, we use the lagged five-year average of the IICCR as a regressor ($IICCR(-1)$). A dynamic specification is suggested by Haque et al. (1996:718) who find that "there is considerable persistence in the ratings, so that a country tends to retain its rating over time unless

significant adverse or positive developments occur". While the low frequency of our data set is likely to reduce the persistence of $IICCR$, it turned out that the fit of our model improved substantially when we included the lagged dependent variable.

Additional control variables are: regional dummies (for East Asia, Eastern Europe and Central Asia, South Asia, Latin America and Subsaharan Africa) the log of a country's real, PPP-adjusted per capita income at the beginning of a five-year period ($INCOME$), the initial level of government debt as a share of GNI ($GOVDEBT$), the initial volume of reserves as a share of imports ($RESERVES$), the log of the average inflation rate in the past five-year period ($INFLA(-1)$), and the inital degree of trade openness ($OPEN$), measured as the ratio of exports and imports to GNI. We conjecture that using initial values reduces the risk that these variables are endogenous with respect to IICCR. Whether this conjecture is correct will have to be tested.

Given our choice of proxies and control variables, the empirical model is specified as follows:

$$IICCR_{it} = \delta IICCR_{i(t-1)} + \beta_n PRIVLOANS_{it} + \beta_G PUBLOANS_{it} + \sum_{k=1}^{K} \gamma_k \, x_{k,it} + \xi_t + \varepsilon_{it} \tag{14}$$

.

As outlined above, we will estimate this equation applying instrumental variable (IV) techniques. Initially, we will use $CREDREG_{it}$, $LATITUDE_i$, $POLREPRESS_{it}$, and $TOT(-1)_{it}$ as instruments for $PRIVLOANS_{it}$.

Note that, for the time being, we do not decompose the disturbance ε_{it} into an unobserved/fixed effect and a white noise error. However, our t-statistics will be based on standard errors that are robust to heteroskedasticity and serial correlation within clusters. In the presence of heteroskedasticity, IV estimation is consistent, but a GMM estimator, which optimizes the weights of the moment

conditions, is more efficient (see (Baum et al. (2003)). We therefore decided to apply the GMM estimator. We will later check different alternatives and show that our key results do not hinge on this particular choice.

4.3 Results

4.3.1 Single-equation regressions

The first column in Table 1 shows the results of estimating equation (14) by GMM.[14] Apparently, private foreign borrowing has a strongly positive effect on creditworthiness, even if we take into account the potential endogeneity of this variable. Except for $OPEN$, most of the control variables have the expected sign. The fact that public borrowing ($PUBLOANS$) has a positive effect seems surprising at first glance. Note, however, that our model did not offer any hypothesis on the effect of this variable.

The p-value associated with Hansen's J-statistic supports our overidentifying restrictions, and the p-value on the (partial) significance of excluded instruments does not signal a serious problem with weak instruments. We also tested whether $PRIVLOANS$ is exogenous by performing a ("difference in Sargan") C test. The p-value at the bottom of column 1 indicates that we have to reject this hypothesis, which confirms our assumption about the endogeneity of private borrowing.

When we re-ran our regressions with varying specifications, it turned out that we can improve the quality of the empirical model by dropping $POLREPRESS$ from the list of instruments. Column (2) shows the result of estimating (14) with a reduced set of instruments. While the J-statistic is somewhat lower, it is still in the acceptable range. Conversely, the relevance of the remaining instruments increases substantially. The following results will therefore be based on regressions that use the smaller set of instruments.

[14]To implement this estimator, we used the *ivreg2* module programmed for *Stata* by Baum et al. (2006).

In the theoretical model of section 2, public borrowing G was assumed to be exogenous. However, this assumption may not be correct. We therefore estimated equation (14) by instrumenting both $PRIVLOANS$ and $PUBLOANS$. The results are displayed in column 3 of Table 1. To test the hypothesis that $PUBLOANS$ is exogenous, we computed the C statistic. The p-value referring to the null hypothesis is displayed in the last row: apparently (and quite surprisingly) we cannot reject the exogeneity of public borrowing.

We also tested the exogeneity of the other – included and excluded – instruments by performing individual C-tests for all regressors. The results prevent us from rejecting the null of exogeneity, suggesting that our empirical model is properly specified.[15]

As mentioned above, GMM estimation is more efficient than IV estimation if disturbances are not homoskedastic. The downside are the poor small-sample properties of the GMM estimator. To check whether using GMM has any consequences for our results, we estimated equation (14) neglecting the presence of heteroskedasticity and serial correlation. The results are displayed in column 4 of Table 1. Apparently, the estimated coefficients and standard errors of the relevant variables do not change by much.

Finally, we checked whether our results are just picking up unobserved heterogeneity: if $\varepsilon_{it} = \alpha_i + \nu_{it}$ and if the "unobserved effect" α_i is correlated with the regressors, our estimates are biased. The presence of the lagged dependent variable $IICCR(-1)$ on the right hand side prevents us from simply applying the "fixed effects" estimator. We therefore follow the approach of Arrelano and Bond (1991) and estimate (14) by differencing both the LHS and the RHS and by using lagged levels of the regressors as instruments. Not surprisingly, the estimated coefficients and significance levels change (see column (5) of Table 1). However, we

[15]The p-values are: 0.44 for $CREDREG$, 0.50 for $TOT(-1)$, 0.53 for $PUBLOANS$, 0.36 for $INCOME$, 0.40 for $GOVDEBT$, 0.44 for $RESERVES$, 0.99 for $INFLA(-1)$, 0.46 for $OPEN$.

still find a significantly positive impact of private borrowing on creditworthiness.

4.3.2 Alternative proxies for the "entrepreneurial class" and varying samples

So far, we used the volume of private foreign *borrowing* relative to GNI as a proxy for the equilibrium size of the "entrepreneurial class" (n^{eq}) – or, more generally, for the strength of political resistance against government default. In this subsection we check whether our affirmative results are an artifact of this particular choice and use a number of "close relatives" as alternative proxies.

In column (1) of Table 2 we use the initial level of private foreign *debt* instead of private foreign *borrowing*. While our theoretical model points to the volume of new loans as a proxy for n^{eq}, the initial *stock* of private debt is also proportional to the private-sector costs of public default. The estimated coefficients and t-statistics indicate that our key hypothesis – that private exposure to international capital markets has a positive effect on creditworthiness – is also supported if we use this modified specification.

As an alternative to separately including $PRIVLOANS$ and $PUBLOANS$ we used the *ratio* of those two variables, i.e. the share of private foreign borrowing relative to public (and publicly guaranteed) foreign borrowing ($PRIVLOANS/PUBLOANS$). While the estimated coefficient of this variable is positive and significant, the J-statistic indicates problems with the overidentifying restrictions. Upon closer scrutiny, it turned out that this was due to a few extreme observations that are characterized by huge private loans and a tiny volume of public foreign borrowing. To attenuate the impact of these data points, we took the log of $(1 + PRIVLOANS/PUBLOANS)$.[16] The results in column (2) of Table 2 indicate that this variable has a significantly positive effect.

[16]Using ln(1+x) instead of ln(x) prevented us from dropping those observations for which $PRIVLOANS$ is zero.

Returning to our benchmark specification (column (2) in Table 1), we tested whether our results survive small modifications in sample size. Column (3) of Table 2 displays the results of omitting multivariate outliers *à* la Hadi (1994). While the quality of our instruments deteriorates when we drop these nine observations, the key relationship – the positive impact of $PRIVLOANS$ on $IICCR$ – still emerges.

Dropping those observations for which $PRIVLOANS = 0$ has almost no impact on our results (see column (4) of Table 2). Conversely, omitting those countries for which $PRIVLOANS$ was greater than 15 percent substantially lowers the precision of our estimate and raises the significance level of the estimated coefficient slightly above 5 percent (column (5)). While this illustrates that countries with a huge volume of private foreign borrowing are quite influential in generating our results, our key findings are still intact if we remove these observations.

4.3.3 System estimation

So far, we have used single-equation GMM techniques to estimate the impact of private foreign borrowing n^{eq} on creditworthiness q^{eq}. Since our model establishes a simultaneous effect of creditworthiness on foreign borrowing, it is of interest whether both causal effects can be uncovered when we estimate the whole system. To do this, we stick to the identifying assumptions used above: specifically, we keep assuming that $CREDREG$, $LATITUDE$ and $TOT(-1)$ affect $IICCR$ through their impact on $PRIVLOANS$ – i.e. that these variables should be *excluded* instruments in the $IICCR$ equation – while the control variables in (14) have a direct effect on creditworthiness.[17] We somewhat depart from our previous specification by including regional and time dummies in both the n^{eq}-equation

[17]Note that the validity of this assumption was tested using the J-tests and C-tests mentioned above.

and the q^{eq} equation. Table 3 presents the results of estimating this system by 3SLS. Column (1) confirms our previous finding that private borrowing raises creditworthiness. The second column illustrates that $PRIVLOANS$, in turn, is affected by $IICCR$. It also confirms that the quality of credit market regulation as reflected by $CREDREG$ is a strong determinant of private foreign borrowing. The p-value of the Hansen-Sargan stastic displayed in the last row of column (2) prevents us from rejecting the hypothesis that the model is correctly specified.

Despite the good performance of our empirical model and the affirmative diagnostic statistics, we wondered whether the positive coefficient of $PRIVLOANS$ in the first equation might just pick up a *direct* effect of financial deregulation on creditworthiness. To test this conjecture, we modified our specification and included $CREDREG$ in both the $IICCR$ and the $PRIVLOANS$ equation. The results in column (2.1) of Table 3 indicate that there is a positive effect of the credit regulation variable on creditworthiness, but that it is not significant. This confirms our conjecture that the effect of regulatory quality in the financial sector on sovereign risk mainly acts via its impact on private borrowing, which, in turn, reduces the likelihood of default.

5 Summary and conclusions

While external debt figures among the usual suspects when it comes to explaining sovereign risk, little attention has been devoted to the potentially different effects of *private* and *public* foreign borrowing. The main contribution of our paper is to emphasize that this difference is substantial, and that higher private foreign borrowing may *raise* government creditworthiness by increasing the political costs of default.

Our empirical results lend support to this view: even if we account for the mutual dependence of sovereign risk and private borrowing, the causal relationship outlined above is clearly discernible: an exogenous increase in private exposure

to international capital markets – triggered, e.g., by an improved regulatory environment in the financial sector – raises governments' creditworthiness.

However, the empirical success of our simple hypothesis should not mask the complex interaction between private borrowing, public borrowing, and the likelihood of financial crises: by focusing on the political-economy implications of private sector exposure, we have not allowed private sector borrowing to have a negative impact on sovereign creditworthiness – e.g. by raising the likelihood of a costly fiscal bailout as described by Reinhart (2002). Moreover, we have modeled the default decision of the *private* sector in a rather simplified fashion. Allowing successful entrepreneurs to deny repayment would move the model closer to reality and partially shift the focus from financial sector deregulation towards the enforcement of property rights.

Finally, we used the *volume* of private foreign borrowing as a proxy for the size of the "entrepreneurial class". The assumption that all agents borrow the same amount on international capital markets is, of course, heroic. Departing from this assumption would require to look at the cross-sectional distribution of foreign borrowing. If such activities were concentrated in the hands of a few agents, this would lower the share of the population opposing government default. However, it would also raise the stakes and political activism of those agents, such that, from a theoretical point of view, the overall impact on sovereign creditworthiness is ambiguous. We believe that these and related questions provide ample scope for future research.

6 Data appendix

6.1 Definitions and sources

Institutional Investor Country Credit Rating (IICCR): Country Credit Ratings published in the Institutional Investor magazine every March and September since

1980. Source: Institutional Investor magazine.

PRIVLOANS: Five-year average of (foreign loans disbursed to private entities and not guaranteed for repayment by a public entity)/GNI.Sources: World Bank (2006a), World Bank (2006b).

PUBLOANS: Five year average of (foreign loans disbursed to public debtor or guaranteed for repayment by a public entity)/GNI.Sources: World Bank (2006a), World Bank (2006b).

INCOME: Log of initial value of real per capita income in constant PPP-adjusted dollars. Source: World Bank (2006a).

GOVDEBT: Initial value of (outstanding external debt of public sector or guaranteed for repayment by a public entity)/GNI Sources: World Bank (2006a), World Bank (2006b).

RESERVES: Initial value of the ratio (International reserves)/(Imports of goods and services) Source: World Bank (2006a).

INFLA(-1): Average growth rate of the consumer price index in the preceding five-year period. Source: World Bank (2006a)

OPEN: Initial value of the ratio (Exports + imports)/GNI. Source: World Bank (2006a)

CREDREG: Initial value of the *Fraser Institute's* index of credit market regulation, ranging from 0 (minimal regulation) to 10 (maximal regulation). Criteria: (i) Ownership of banks: percentage of deposits held in privately owned banks; (ii) Competition: domestic banks face competition from foreign banks; (iii) Extension of credit: percentage of credit extended to private sector; (iv) Avoidance of interest rate controls and regulations that lead to negative real interest rates; (v) Interest rate controls: interest rate controls on bank deposits and/or loans are freely determined by the market. Source:Fraser Institute (2006).

LATITUDE: Squared latitude. Source: World Bank (2001).

TOT(-1): Average level of the terms of trade in the preceding five-year period. Terms of trade were computed by dividing the series "Exports as a capacity to import (in constant LCU)" by the series "Exports of goods and services (in constant LCU)" Source:

World Bank (2006a).

POLREPRESS: Average level of the *Freedom House* index of political rights, ranging from 0 (maximal rights) to 7 (minimal rights). Source: Freedom House (2006).

6.2 Countries

Algeria , Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Bulgaria, Cameroon, Chile, China, Colombia, Congo Rep., Costa Rica, Cote d'Ivoire, Democratic Republic of Congo, Dominican Republic, Ecuador, Egypt Arab Rep., El Salvador, Estonia, Gabon, Ghana, Haiti, Honduras, Hungary, India, Indonesia, Jamaica, Jordan, Kenya, Latvia, Lithuania, Malawi, Malaysia, Mali, Mauritius, Mexico, Morocco, Nicaragua, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Senegal, Sierra Leone, South Africa, Sri Lanka, Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela RB, Zambia, Zimbabwe.

References

Acemoglu, D., S. Johnson and J.A. Robinson: "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review, vol. 91, 1369-1401*, (2001).

Amador M.: "A Political Economy Model of Sovereign Debt Repayment." *unpublished Working Paper*, (2002).

Arellano M. and S. Bond: "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies, vol. 58, 277-297*, (1991).

Arteta C. and G. Hale: "Are Private Borrowers Hurt by Sovereign Debt Rescheduling?." *Federal Reserve Bank of San Francisco and the Board of Governors of the Federal Reserve System, mimeo*, (2005).

Arteta C. and G. Hale: "Sovereign Debt Crises and Credit to the Private Sector." *Federal Reserve Bank of San Francisco and the Board of Governors of the Federal Reserve System, mimeo*, (2006).

Baum, C.F., Schaffer, M.E. and S. Stillman: "Instrumental variables and GMM: estimation and testing." *Boston College Working Paper No. 545*, (2003).

Baum, C.F., Schaffer, M.E. and S. Stillman: "ivreg2: Stata module to Extended instrumental variables/2SLS, GMM and AC/HAC, LIML and k-class regressions." *http://ideas.repec.org/c/boc/bocode/s425401.html*, (2006).

Block S.A. and P.M. Vaaler: "The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries." *Journal of International Money and Finance, vol. 23, 917-946*, (2004).

Blundell R. and S.R. Bond: "Initial conditions and moment restrictions in dynamic panel data models" *Journal of Econometrics, vol. 87, 115-143*, (1998).

Bond S.: "Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice." *CEMMAP Working Paper No. CWP09/02*, (2002).

Borensztein, E., K. Cowan, and P. Valenzuela: "The Sovereign Credit Ceiling Lite." *Inter-American Development Bank and Central Bank of Chile, mimeo*, (2006a).

Borensztein, E., K. Cowan, and P. Valenzuela: "Bank Credit Ratings in Emerging Market Economies." *Inter-American Development Bank and Central Bank of Chile, mimeo*, (2006b).

Bulow J. and K. Rogoff: "A Constant Recontracting Model of Sovereign Debt." *Journal of Political Economy, vol. 97, 155-178*, (1989).

Cantor R. and F. Packer: "Determinants and Impact of Sovereign Credit Ratings." *FRBNY Economic Policy Review*, (October 1996).

Cole H. and P. Kehoe: "Reviving Reputation Models of International Debt." *Federal Reserve Bank of Minneapolis Quarterly Review, vol. 21*, (1997).

Durbin, E. and D. Ng: "The sovereign ceiling and emerging market corporate bond spreads." *Journal of International Money and Finance 24, 631-649*, (2005).

Easterly W. and R. Levine: "Tropics, Germs and Crops: How Endowments influence Economic Development." *Journal of Monetary Economics, vol. 50, 3-39*, (2003).

Eaton, J. and R. Fernandez: "Sovereign Debt."In G. Grossman and K. Rogoff (eds.) *Handbook of International Economics, vol. III*, (1995).

Eaton J. and M. Gersovitz: "Debt with potential repudiation: theory and estimation." *Review of Economic Studies ,vol. 48, 289-309.*, (1981).

Eichengreen B. and P.H. Lindert: *The international debt crisis in historical perspective.* The MIT Press (Cambridge, MA) (1989).

Eichengreen B. and A. Mody: "What explains changing Spreads on Emerging Market Debt: Fundamentals or Market Sentiment? " *NBER Working Paper No. 6408*, (1998).

Fraser Institute: "Economic Freedom in the World" , (2006).

Freedom House: "Freedom in the World" , (2006).

Gelos, R.G., R. Sahay, and G. Sandleris: "Sovereign Borrowing by Developing Countries: What Determines Market Access? " *IMF Working Paper No. 03/xx*, (2003).

Hadi A.S.: "A Modification of a Method for the Detection of Outliers in Multivariate Samples." *Journal of the Royal Statistical Society, Series B, vol. 56, 393-396.* (1994).

Haque U. N., M. Kumar, N. Mark, and D. Mathieson: "The Economic Content of Indicators of Developing Country Creditworthiness." *IMF-Staff Papers, vol. 43, 688-724*, (1996).

Harms, P. and S. Zink: "Growing into and out of social conflict." *Economica, vol. 72, 267-286.* (2005).

Harms, P. and M. Rauber: "Foreign aid and developing countries' creditworthiness." *Study Center Gerzensee Working Paper No.* , (2006).

Jeske, K.: "Private international debt with risk of repudiation." *Journal of Political Economy, vol. 114, 576-593.* (2006).

Kaufmann, D. A. Kraay, and M. Mastruzzi : "Governance Matters V: Governance Indicators for 19962005" *Washington DC, The World Bank*, (2006).

Manasse P., N. Roubini and A. Schimmelpfennig: " Predicting Sovereign Debt Crises." *IMF Working Paper No. 03/221*, (2003).

Miller, D.A., M. Tomz C. and M.L.J.Wright: "Sovereign Debt, Defaults, and Bailouts." *Stanford University, mimeo*, (2006).

Reinhart, C.M.: "Credit ratings, default, and financial crises: evidence from emerging markets" *World Bank Economic Review 16, 151-170*, (2002).

Rodrik D., A. Subramanian and F. Trebbi: "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development." *Journal of Economic Growth, vol. 9, 131-165*, (2004).

Rose, A. : "One reason countries pay their debts: renegotiation and international trade" *Journal of Development Economics*, (2005).

Saiegh S. M.: "Income Redistribution, Political Competition, and Sovereign Debt Repudiation." *unpublished Working Paper*, (2005).

Tomz M.: "Democratic Default: Domestic Audiences and Compliance with International Agreements." *unpublished Working Paper*, (2002).

van Rijckeghem C. and B. Weder.: " The Politics of Debt Crises." *unpublished Working Paper*, (2004).

World Bank: "Global Development Network Growth Database " *Washington DC, The World Bank*, (2001).

World Bank: "World Development Indicators 2006 on CD-ROM " *Washington DC, The World Bank*, (2006a).

World Bank: "Global Development Finance 2006 on CD-ROM " *Washington DC, The World Bank*, (2006b).

6 Tables

Table 1: The effect of $PRIVLOANS$ on $IICCR$ – single-equation regressions

	(1) GMM	(2) GMM (few instr.)	(3) GMM (PUBLOANS endog.)	(4) IV	(5) GMM (Arellano-Bond)
IICCR(-1)	0.412	0.413	0.375	0.417	0.382
	(4.11)***	(4.16)***	(2.55)**	(3.96)***	(2.24)**
PRIVLOANS	3.958	3.945	4.343	4.14	1.933
	(2.37)**	(2.37)**	(2.24)**	(2.28)**	(2.37)**
PUBLOANS	0.415	0.412	1.32	0.352	0.225
	(1.90)*	(1.87)*	(0.83)	(1.53)	(0.57)
INCOME	5.848	5.826	6.169	5.579	12.243
	(3.64)***	(3.54)***	(2.85)***	(3.27)***	(1.65)
GOVDEBT	-0.02	-0.02	-0.041	-0.019	-0.012
	(2.08)**	(2.07)**	(1.10)	(2.01)**	(0.61)
RESERVES	0.056	0.056	0.069	0.055	0.036
	(4.27)***	(4.25)***	(2.35)**	(4.00)***	(0.57)
INFLA(-1)	-0.662	-0.659	-0.501	-0.487	0.772
	(1.34)	(1.35)	(1.02)	(0.93)	(0.87)
OPEN	-0.041	-0.04	-0.04	-0.032	-0.066
	(1.44)	(1.36)	(0.99)	(0.95)	(0.91)
East Asia/Pacific	-3.347	-3.264	-1.903	-4.106	
	(0.67)	(0.63)	(0.30)	(0.70)	
South Asia	3.27	3.252	6.158	3.255	
	(1.17)	(1.17)	(1.17)	(1.17)	
E. Europe/ C. Asia	-16.478	-16.395	-16.868	-16.972	
	(2.32)**	(2.27)**	(2.26)**	(2.23)**	
Sub-Sah. Africa	-0.955	-0.995)	1.475	-1.00	
	(0.45)	(0.46)	(0.29)	(0.46)	
Latin America	-6.89	-6.879	-5.349	-6.874	
	(2.27)**	(2.27)**	(1.30)	(2.23)**	
Oil	-0.15	-0.18	0.167	-0.561	
	(0.06)	(0.07)	(0.06)	(0.22)	
Observations	213	213	213	213	178
R-squared	0.69	0.69	0.62	0.67	
J-stat. (p value)	0.83	0.64	0.50	0.64	0.35
Excl. instr. (p value)	0.11	0.05	0.08/0.33	0.05	
Exog. (p value)	PRIVLOANS: 0.00		PUBLOANS: 0.53		
AB stat. (p value)					0.67

Notes on Table 1: In parentheses: Absolute values of t-statistics, based on a robust covariance-matrix.
***, **, *: significance levels of 1, 5, 10 percent.
The coefficients of the time dummies (not shown) are available upon request.

Table 2: Alternative proxies for n and different subsamples

	(1) Priv. Ext. Debt	(2) Priv./Pub. Borrowing	(3) PRIVLOANS No outliers	(4) PRIVLOANS PRIVLOANS > 0	(5) PRIVLOANS PRIVLOANS < 15
IICCR(-1)	0.381	0.433	0.336	0.325	0.392
	(4.02)***	(4.28)***	(2.27)**	(2.91)***	(2.70)***
Priv. borrowing	1.212	5.289	6.750	3.879	5.981
	(2.71)***	(2.97)***	(2.02)**	(2.71)***	(1.89)*
PUBLOANS			0.264	0.466	0.269
			(0.85)	(1.39)	(0.99)
INCOME	4.969	0.905	3.12	5.991	5.57
	(2.96)***	(0.55)	(2.07)**	(2.74)***	(2.72)***
GOVDEBT	-0.02	0	-0.078	-0.066	-0.018
	(1.47)	(0.02)	(3.53)***	(2.88)***	(1.62)
RESERVES	0.045	0.078	0.064	0.032	0.055
	(2.77)***	(3.22)***	(2.58)**	(1.16)	(2.93)***
INFLA(-1)	-0.462	-1.408	-0.512	-0.488	-0.364
	(0.95)	(2.07)**	(0.97)	(0.80)	(0.65)
OPEN	0.005	0.045	0.02	-0.053	-0.004
	(0.20)	(1.87)*	(0.82)	(1.37)	(0.16)
Observations	213	210	204	157	211
R-squared	0.5	0.68	0.63	0.62	0.60
J-stat. (p-value)	0.24	0.56	0.91	0.75	0.67
Excl. instr. (p)	0.08	0.04	0.12	0.03	0.07

Notes on Table 2: In parentheses: Absolute values of t-statistics, based on a robust covariance-matrix.
***, **, *: significance levels of 1, 5, 10 percent.
The coefficients of the time dummies and regional dummies (not shown) are available upon request.

Table 3: System estimation

	(1.1) IICCR	(1.2) PRIVLOANS	(2.1) IICCR	(2.2) PRIVLOANS
IICCR(-1)	0.506		0.52	
	(6.03)***		(5.32)***	
PRIVLOANS	4.932		4.044	
	(4.25)***		(2.45)**	
PUBLOANS	0.178	0.031	0.219	0.031
	(0.81)	(0.69)	(1.15)	(0.70)
CREDREG		0.217	0.286	0.204
		(2.77)***	(0.55)	(2.42)**
GOVDEBT	-0.017		-0.017	
	(2.50)**		(2.49)**	
INCOME	3.393		3.511	
	(3.80)***		(3.45)***	
RESERVES	0.037		0.038	
	(2.79)***		(2.52)**	
INFLA(-1)	-0.046		-0.016	
	(0.14)		(0.05)	
IICCR		0.028		0.028
		(1.90)*		(1.89)*
LATITUDE		0.000		0.001
		(1.60)		(1.51)
TOT(-1)		0.002		0.003
		(0.70)		(0.61)
Observations	213	213	213	213
Hansen-Sargan (p)	0.92		0.89	

Notes on Table 3: In parentheses: Absolute values of t-statistics, based on a robust covariance-matrix.
***, **, *: significance levels of 1, 5, 10 percent.
The coefficients of the time dummies and regional dummies (not shown) are available upon request.

Figure 1

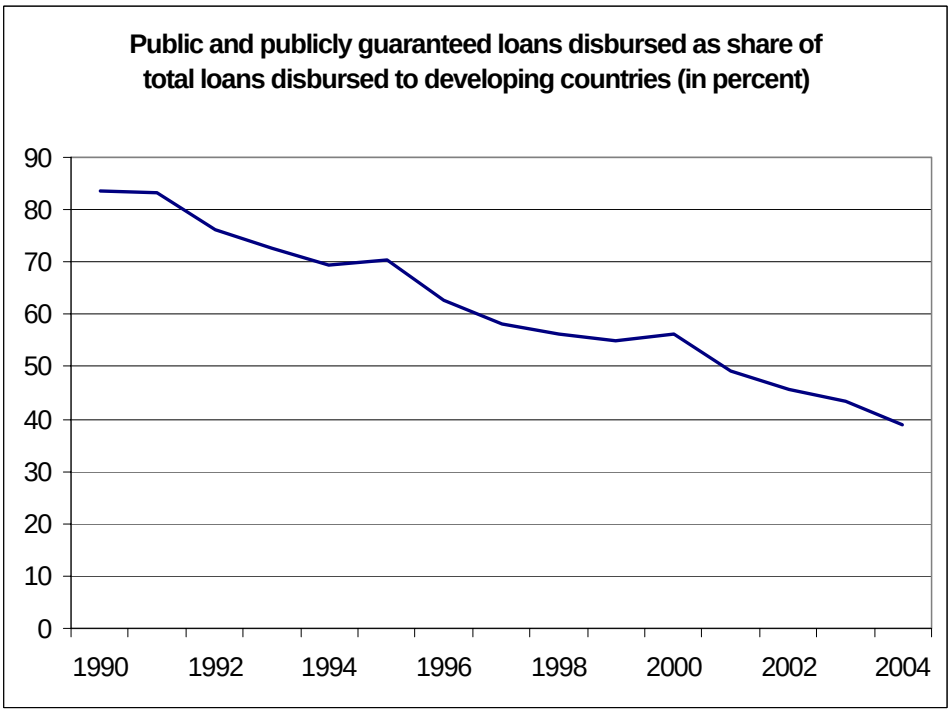


Figure 2

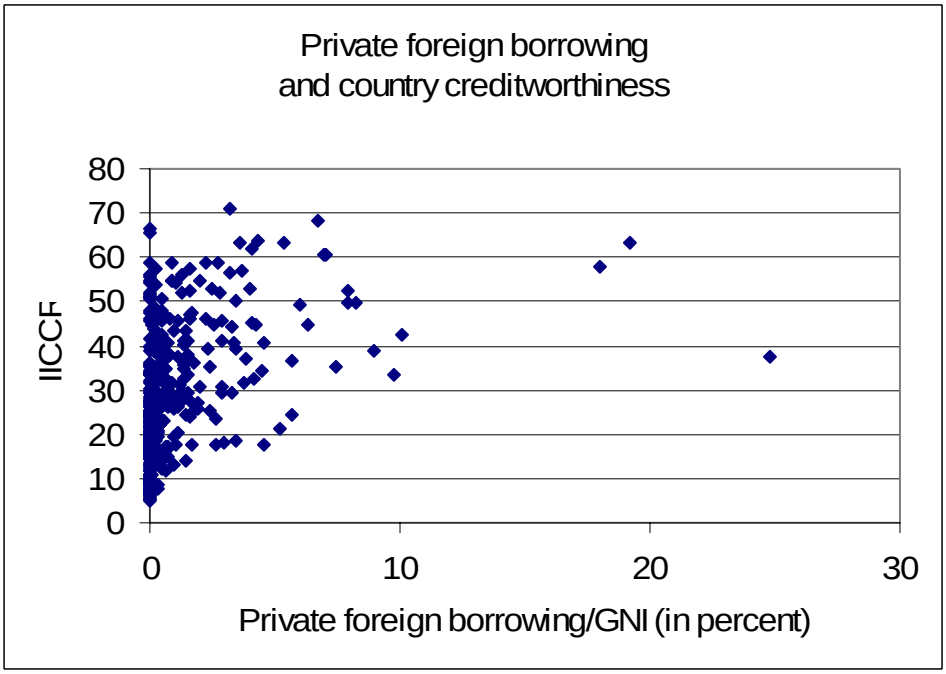
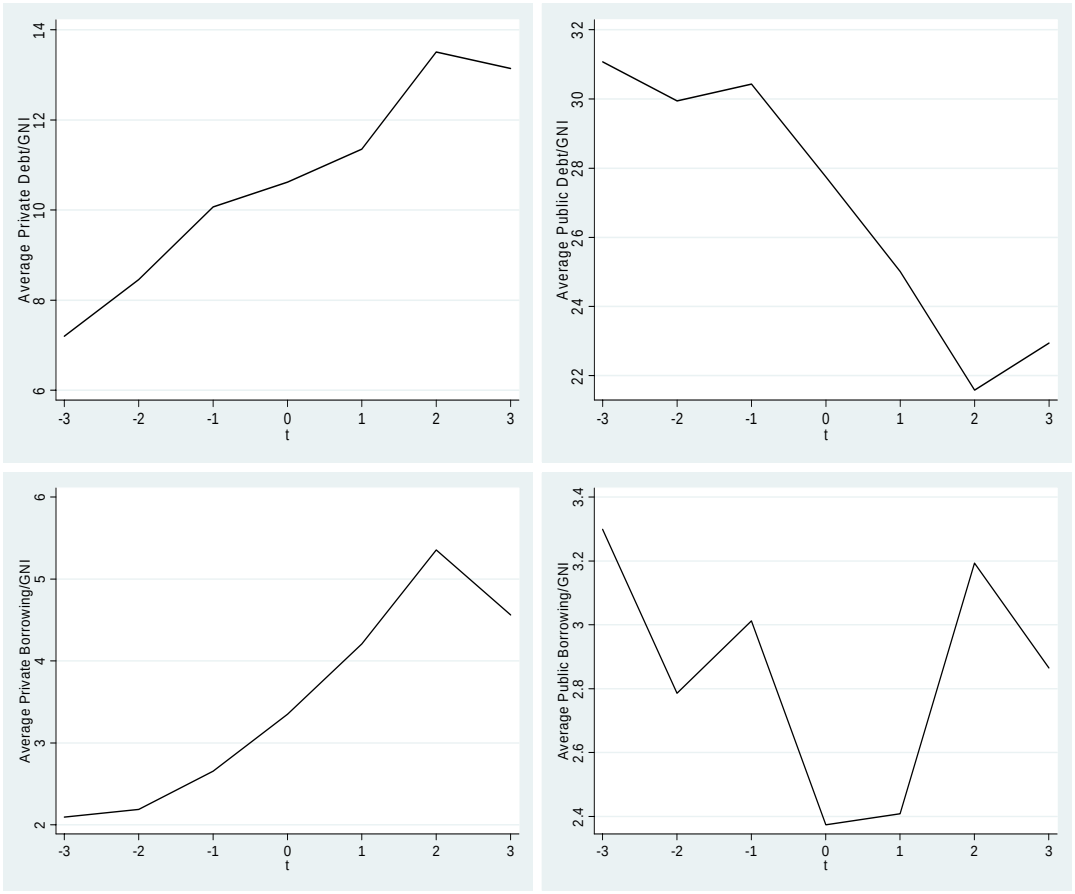


Figure 3 . Average public and private external debt and borrowing before and after Moody's sovereign rating increases (percent of GNI).



Notes: Worldbank Global Development Finance database and Moody's Investor Service. t=0 denotes the year in which there was a sovereign rating upgrade. Rating upgrades that were preceeded by a rating change in the past 3 years were excluded.

Figure 4

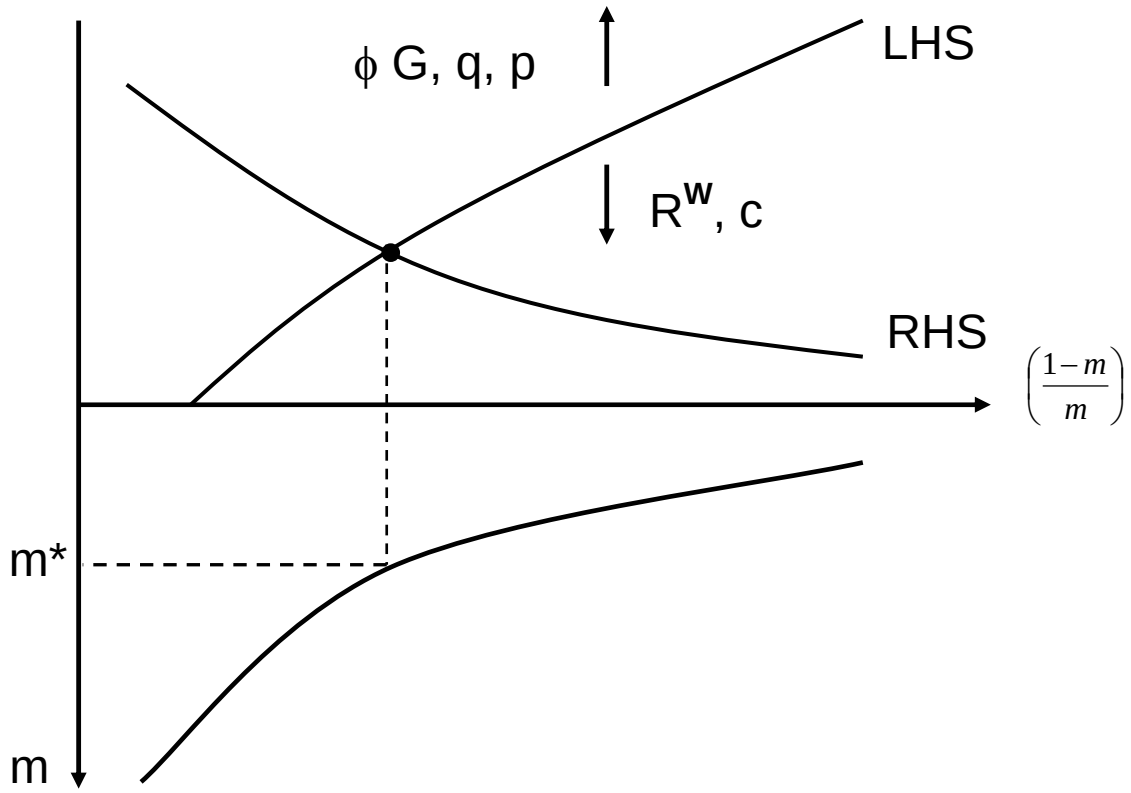


Figure 5

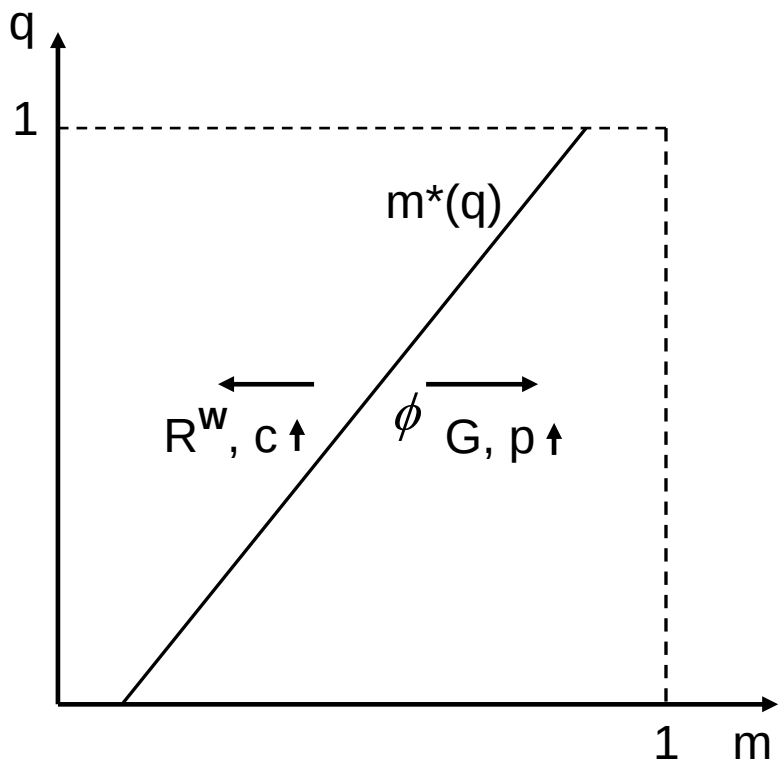


Figure 6

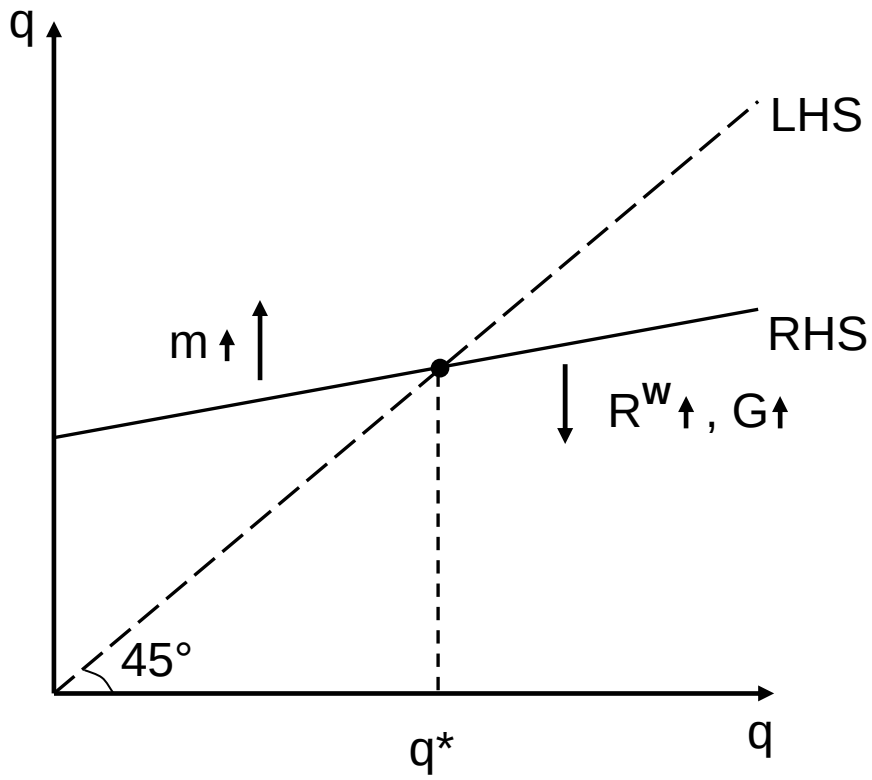


Figure 7