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 is commensurate with 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 chooses 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 all subsequent periods, hence $G_{t+j} = 0$ for all $j \geq 1$.[9] 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*.[10] An entrepreneur sets up a firm before θ_i is realized. We assume that setting up a firm requires a fixed payment K, which should be interpreted as the cost of establishing a brand name, acquiring a cus-

[9] Our main argument would still hold if we assumed that, after a default, the government is unable to borrow for a *limited* number of periods.

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

tomer basis etc.. 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 $\theta_i = 1$, 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 $\gamma R^P K$.[11] 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:

[11] 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:

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

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

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

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

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

$$L_i = \frac{1-m}{m}, \tag{8}$$

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

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

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 or p has a positive effect on m^* whereas raising c or R^W lowers the equilibrium number of successful entrepreneurs.[12] Moreover, q has a positive effect on m^*: 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 the sum of domestic agents' utilities. Moreover, it 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:

[12] While raising the likelihood of entrepreneurial success p increases m^*, the impact 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.

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

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

$$\hat{\rho} = R^G G - mK. \tag{11}$$

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

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

In what follows, we *assume* that (12) has a unique solution, as illustrated in Figure 6.[13] 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

[13]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.

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.

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 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 unit of time measurement is five years, reflecting the persistence of sovereign creditworthiness and the fact that the political economy considerations we have modeled are likely to have a discernible effect on creditworthiness only at a low frequency. The variables used in our regressions will therefore either be five-year averages (1980-84, 1985-1989, 1990-1994, 1995-1999, 2000-2004), or initial values of the respective five-year periods.

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.[14] Estimating (13) by OLS would therefore produce biased parameter estimates. However, 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. The validity of this claim will have to be confirmed using tests of instrument relevance and exclusion restrictions, as discussed below.

[14]Recent empirical research also shows that a higher assessment of sovereign risk may reduce corporate credit ratings and lower the supply of credit to private borrowers (see Durbin and Ng (2005), Borensztein et al. (2006b))

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 five-year average of 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.[15]

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 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.[16]

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" relative to a country's GNI, averaged over five years ($PRIVLOANS$). 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 and averaged over five years

[15] As reported by Haque et al. (1996), the individual criteria used by banks to assess default risk are not specified.

[16] 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.

($PUBLOANS$). 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 discussed 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. In our regressions, we use the *initial* values of $CREDREG$ for the different five-year periods.[17]

To capture the share of government borrowing that is used productively (ϕ), we need a measure of "governance". We use the squared distance from the equator ($LATITUDE$) as a first 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. Based on the idea that more autocratic governments are more likely to squander the means borrowed abroad, we use the Freedom House (2006) measure of political rights ($POLRIGHTS$) as an additional proxy for ϕ. Finally, we construct a measure of the quality of governance based on the *International Country Risk Guide (ICRG)* country risk ratings (Political Risk Services (2006)). We take a

[17]We also experimented with alternative proxies of the financial infrastructure such as banking system competition (Abiad et al. (2007)) and concentration Beck et al. (2000)), which are available annually but for a smaller sample of countries. However, these variables did not have any value added over $CREDREG$ in terms of improving the first-stage fit.

simple average of three indices that measure the quality of the bureaucracy, the rule of law, and the prevalence of corruption, where a higher rating indicates better governance. We note that this variable ($GOVERNANCE$) not only captures the share of foreign public borrowing that is likely to be used productively, but also the investment climate facing the private sector. A higher value of the index is likely to be associated with fewer bureaucratic, administrative, and legal hurdles for private businesses, and therefore would be expected to be positively correlated with $PRIVLOANS$.[18]

The hardest task is to find instruments which capture the likelihood of entrepreneurial success. Arguing that high and stable export demand growth improves business prospects, especially in economies which are heavily dependent on agricultural and raw materials exports, we use the five-year average of trading partners' GDP growth, lagged by one period ($TPGROWTHAV(-1)$) as well as the standard deviation of these growth rates ($TPGROWTHSD$) as proxies for p. As with the other instruments, the conjecture that this variable influences sovereign creditworthiness only through its effect on $PRIVLOANS$ will have to be tested.

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

[18]Carefully testing whether this variable can, in fact, be excluded from the IICCR equation will be crucial, since a government that uses resources more productively is more likely to be able to raise the taxes needed to service future debt obligations, and therefore have higher creditworthiness.

variable.

Additional control variables are: 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.[19] We also control for the contemporaneous five-year average of an index of government stability ($GOVSTABILITY$), compiled by the ICRG, as a measure of political risk.[20] Finally, we include regional dummies for East Asia, Eastern Europe and Central Asia, South Asia, Latin America and Subsaharan Africa.

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. Note that we do not initially decompose the disturbance ε_{it} into an unobserved country fixed effect and an idiosyncratic white noise error. In most regressions, we report standard errors that are robust to heteroskedasticity

[19] We also experimented with including the initial or lagged values of the current account balance and the central government budget balance in the set of controls, but found these variables to be insignificant in all regressions. Using the contemporaneous values of these variables would be problematic as they include interest payments which are likely to be influenced by the sovereign credit rating.

[20] $GOVSTABILITY$ provides an assessment both of the government's ability to carry out its declared programs and its ability to stay in office. The rating is the sum of three subcomponents, namely government unity, legislative strength, and popular support.

and serial correlation within clusters. In the presence of heteroskedasticity, two stage least squares (TSLS) estimation is consistent, but a generalized method of moments (GMM) estimator, which optimizes the weights of the moment conditions, is more efficient (see Baum et al. (2003)). At the same time, the limited information maximum likelihood (LIML) estimator is more robust (in terms of having lower bias and more reliable standard errors) than the GMM estimator when the instruments are not strongly correlated with the endogenous variables.[21] We therefore apply the GMM estimator in most regressions, also reporting the Cragg and Donald (1993) first stage statistic of instrument relevance, as well as the LIML estimate of the coefficient of PRIVLOANS and the confidence intervals of this coefficient based on the Moreira (2003) conditional likelihood ratio test statistic.[22] Finally, we also present Arellano and Bond (1991) difference-GMM estimates that are robust to the presence of unobserved fixed country effects in the IICCR equation.[23]

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[21]Comprehensive surveys on weak instruments are provided by Stock et al. (2002) and Stock and Yogo (2005). Stock and Yogo (2005) propose a formal test for weak instruments based on the Cragg and Donald (1993) statistic and compile critical values of the statistic that indicate the maximal bias and size distortion of TSLS relative to OLS. For the case of a single endogenous regressor and three instruments, for example, the Cragg and Donald statistic would have to exceed 9.08, 6.46, or 5.39 to conclude that the TSLS maximal bias is less than 10, 20, or 30 percent of the OLS bias, respectively.

[22]The Moreira (2003) test statistic, which is robust to the presence of weak instruments, is presented for the case of a single endogenous regressor. We note that the critical values of the Cragg and Donald (1993) test as compiled by Stock and Yogo (2005), as well as the Moreira (2003) likelihood ratio test were developed under the assumption of homoskedasticity.

[23]We used the *ivreg2* module programmed for Stata by Baum et al. (2003) to implement the GMM and LIML estimators, the *condivreg* module to implement the Moreira (2003) conditional likelihood ratio test, and the *xtabond2* module by Roodman (2006) to implement the difference-GMM estimator.

4.3 Results

4.3.1 Benchmark regressions

In the theoretical model of section 2, public borrowing G was assumed to be exogenous with respect to sovereign creditworthiness. However, this assumption may not be correct if governments take their own sovereign credit rating into account when making foreign borrowing decisions. As a first step, we estimate equation (14) by instrumenting both $PRIVLOANS$ and $PUBLOANS$ using $CREDREG, LATITUDE, GOVERNANCE, POLRIGHTS, TPGROWTHAV(-1)$ and $TPGROWTHSD$. The estimates, shown in the first column in Table 1, suggest private foreign borrowing to have a strong positive effect on creditworthiness, but public borrowing to be insignificant. The Cragg and Donald (1993) statistic suggests that our instruments are weak.[24] However, the LIML estimates (shown in the last two rows for the coefficient of $PRIVLOANS$), which are relatively robust to weak instruments, confirm our conclusions about the coefficients of $PRIVLOANS$ and $PUBLOANS$.[25]

Except for $OPEN$, which is estimated to have a negative impact on creditworthiness, most of the control variables have the expected sign and are significant: sovereign creditworthiness increases with real per capita income, decreases with policies that lead to high inflation, increases strongly with government stability and international reserves. The fact that public borrowing ($PUBLOANS$) has no significant effect may seem surprising at first glance. Note, however, that our model did not offer any hypothesis on the effect of this variable. When we implemented "difference in Sargan" C-tests to confirm the en-

[24]critical values of this statistic compiled by Stock and Yogo (2005) imply that the maximal bias of the TSLS estimator based on these instruments could exceed 30 percent of the OLS bias.

[25]The LIML estimate of the coefficient of $PUBLOANS$ in this specification is 2.103 with a standard error of 4.475, suggesting that it is statistically insignificant.

dogeneity of $PRIVLOANS$ and $PUBLOANS$, we failed to reject the hypothesis that $PUBLOANS$ is exogenous with respect to sovereign creditworthiness while we accepted that $PRIVLOANS$ is indeed endogenous with respect to sovereign creditworthiness. We therefore proceed by eliminating $PUBLOANS$ from the set of endogenous regressors.

Column (2) displays the result of estimating (14) by GMM using the same set of exogenous instruments for PRIVLOANS. The estimates indicate that $PRIVLOANS$ has a strong positive effect on sovereign risk. Although we obtain a much better fit in the first stage relative to the previous regression and also accept the validity of the excluded instruments, our equation is still not strongly identified: the Cragg and Donald (1993) statistic suggests the TSLS bias in this specification could reach up to 20 percent of the OLS bias.

In the next regression, we eliminate the instruments referring to trading partners' GDP growth rates ($TPGROWTHAV(-1)$ and $TPGROWTHSD$) and the index of political rights ($POLRIGHTS$) from the set of excluded instruments for PRIVLOANS, given that these variables are not statistically significant (at 10 percent or less) in the first-stage regression. The results are displayed in column (3) of Table 1. The first stage Cragg-Donald statistic capturing the significance of the excluded instruments climbs to 9.6 implying fairly strong identification in the first stage.[26] The Hansen (1982) test of overidentifying restrictions suggests the instruments to be jointly valid and the model to be well specified, and the difference in Sargan tests for the exclusion of the individual instruments (not shown) fail to reject the exogeneity of the instruments.

In column (4) we present the LIML estimates of the specification in column (3) as a robustness check. The coefficient estimates of all regressors are quite

[26]With a single endogenous regressor and three excluded instruments, the critical values of the Cragg-Donald statistic suggests the maximal TSLS bias to be between 5 to 10 percent of the OLS bias. In the first stage regression, the p-value of the coefficient estimates of $CREDREG$, $LATITUDE$ and $GOVERNANCE$ are 0.037, 0.073 and 0.015, respectively.

similar to the GMM estimates given in column (3). The Moreira (2003) conditional likelihood statistic strongly rejects the hypothesis that the coefficient on the endogenous variable, $PRIVLOANS$, is zero, as the confidence interval implied by this test suggests that the coefficient of $PRIVLOANS$ is within the interval [2.317, 6.142] with 95 percent probability.

Finally, we check whether our results are just driven by 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 including country fixed effects in the regressions, given that the time dimension of our sample is maximum five per country.[27] We therefore follow the difference GMM approach of Arellano and Bond (1991) and estimate (14) by differencing the equation and by using lagged levels of the regressors as instruments.

In the regression presented in column (5) we use the first and second lags of the levels of all the included regressors, excluding $PRIVLOANS$, for which we include the contemporaneous levels of $CREDREG$, $LATITUDE$, and $GOVERNANCE$ as instruments. Although the point estimate of the coefficient on $PRIVLOANS$ is somewhat smaller than in the previous regressions this difference does not appear to be significant. The 95 percent confidence interval of the coefficient estimate of $PRIVLOANS$ in this regression ([1.116, 2.742]) largely overlaps with those estimated in the previous regressions ([1.430, 5.704] in the GMM regression in column (3) and [2.087,5.227] in the LIML regression in column (4)), suggesting no large, statistically discernible effect of unobserved heterogeneity on our previous estimates. Moreover, the estimated coefficient of the lagged dependent variable, which would have been expected to be upward biased in the previous regressions if unobserved heterogeneity were indeed present, is virtually the same

[27]See Nickell (1981) for a derivation of the bias associated with the use of dummy variables in dynamic panel estimations.

in the difference-GMM regression as in the previous regressions. Combined with the fact that the coefficient estimates on the remaining regressors are largely unchanged, these findings suggest that there is no significant unobserved heterogeneity in the error term and that the previous results presented in columns 1-4 are not tainted by such heterogeneity.

The regression in column 6 checks the robustness of the difference-GMM estimates by increasing the number of lags included in the instrument set. In particular, we use up to four lags of all instruments, rather than restricting them to the first two lags and the contemporaneous levels for the included and excluded instruments, respectively, as we did in the previous regression. Given the problems associated with overfitting in difference-GMM estimates, we impose the coefficients to be uniform across the time periods in the first stage.[28] As before, this regression yields a statistically significant and positive estimated coefficient on PRIVLOANS (with a 95 percent confidence interval of [0.439, 3.100]), largely unchanged point estimates on the remaining regressors, and an Hansen overidentifying-restrictions test statistic which confirms the validity of the instruments and the specification.

4.3.2 Varying specifications

In this subsection we present various robustness checks on the estimates obtained in the benchmark regression presented in column (3) of Table 1. We begin by testing whether our results depend on the inclusion of any particular instrument and whether our instruments can safely be excluded from the set of controls in the $IICCR$ equation. The regression in column (1) of Table 2 omits credit regulation from the set of excluded instruments and includes it in the second stage equation. This alteration leaves the coefficient estimate of $PRIVLOANS$ largely unchanged, and yields an insignificant coefficient on $CREDREG$ in the

[28] We do this by using the *collapse* option in the *xtabond2* routine in Stata.

$IICCR$ equation. Columns (2) and (3) carry out the same exercise by including $LATITUDE$ and $GOVERNANCE$, respectively, in the $IICCR$ equation rather than in the set of excluded instruments. We continue to have a relatively strong first stage fit, reject the joint hypothesis that the instruments are not valid and the equation is misspecified, and find a positive and statistically significant effect of $PRIVLOANS$ on $IICCR$. Moreover, none of the formerly-excluded instruments enters the $IICCR$ equation with a statistically significant coefficient. This finding confirms that $PRIVLOANS$ is not picking up the omitted effect of the quality of governance.

So far, we have used the volume of private foreign borrowing relative to GNI as a proxy for the size of the "entrepreneurial class n^{eq}, or, more generally, for the strength of political resistance against government default. In column (4) of Table 2 we use the initial level of private foreign *debt* instead of private foreign *borrowing* to test whether our affirmative results are an artifact of this particular choice. 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 estimates presented in column (4) 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.

In all the previous regressions, we have included the ICRG measure of government stability ($GOVSTABILITY$) as a measure of political risk, and this variable has consistently been estimated to have a significant positive effect on sovereign creditworthiness. In the regression in column (5) we replace this variable with an index measuring the "investment profile" of a country ($IPROFILE$). Compiled by the ICRG, this variable provides an assessment of the risk of contract repudiation, expropriation, limited profit repatriation, and payment delays. We find this variable to have a strong positive effect on IICCR, as does $GOVSTABILITY$, but the main findings on $PRIVLOANS$ and other vari-

ables are not changed significantly by its inclusion.

Returning to our benchmark specification (column (3) in Table 1), we finally test whether our results are robust to using Moody's sovereign credit ratings rather than the IICCR as the dependent variable. Although this results in a much reduced sample size, our results still indicate a positive effect of $PRIVLOANS$ on creditworthiness. However, we note that the results in this column need to be treated with caution given that most other regressors loose their significance and that, in some cases, we see large changes in the size of their coefficient estimates.

4.3.3 Robustness to using varying samples

In this subsection we test whether our results survive small modifications in sample size. Column (1) of Table 3 displays the results of omitting observations for which $PRIVLOANS$ equals zero. This has almost no impact on our results. Similarly, omitting those countries for which $PRIVLOANS$ was greater than 15 percent does not influence our results (column (2)). Likewise, omitting the transition economies, most of which received strong capital inflows in the 1990s does not have a significant impact (column (3)). Finally, in column (4) we include observations only from 1990 onward. This significantly improves the first stage fit and the significance of most of our estimates in the second stage, but yields a problematic value of the Hansen J test of the overidentifying restrictions. We therefore repeated the exercise in columns (1)-(3) in Table 2 by including each of our instruments in the $IICCR$ equation. Columns (5)-(7) show the estimates from regressions where $CREDREG$, $LATITUDE$, and $GOVERNANCE$ are respectively included among the set of controls. All these regressions yield a significant coefficient on $PRIVLOANS$, statistically insignificant coefficients on the new controls, and Hansen J statistics that do not signal problems with the validity of the specification and instruments.

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

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).

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).

GOVERNANCE: Simple average of indices measuring bureaucratic quality, corruption, and the rule of law, from the *International Country Risk Guide*. Source: Political Risk Services (2006).

GOVSTABILITY: Index of government stability from the *International Country Risk Guide*. Source: Political Risk Services (2006).

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.

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

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

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

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

POLRIGHTS: Five-year average of the *Freedom House* index of political rights, ranging from 1 (maximal rights) to 7 (minimal rights).Sources: Freedom House (2006).

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).

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

TPGROWTHAV(-1): Lagged five-year average of the growth rate of a weighted average of trading partners' GDP. Sources: World Bank (2006a) and IMF (2006).

TPGROWTHSD: Five-year standard deviation of the growth rate of a weighted average of trading partners' GDP. Sources: World Bank (2006a) and IMF (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.

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6 Tables

Table 1: The effect of PRIVLOANS on IICCR

	(1)	(2)	(3)	(4)	(5)	(6)
PRIVLOANS	3.462***	3.558***	3.567***	3.657**	1.929***	1.769***
	[1.094]	[1.054]	[1.070]	[1.405]	[0.408]	[0.667]
IICCR(-1)	0.421***	0.410***	0.394***	0.394***	0.392***	0.462**
	[0.104]	[0.076]	[0.081]	[0.080]	[0.098]	[0.190]
PUBLOANS	0.143	0.278*	0.283*	0.28	0.515**	0.831***
	[1.186]	[0.163]	[0.165]	[0.177]	[0.200]	[0.271]
GOVSTABILITY	2.347***	2.362***	2.378***	2.320***	2.037***	1.984***
	[0.441]	[0.398]	[0.415]	[0.488]	[0.483]	[0.643]
INCOME	4.424**	4.523***	4.606***	4.390***	5.116	5.423
	[1.798]	[1.354]	[1.358]	[1.471]	[6.637]	[5.811]
GOVDEBT	-0.01	-0.013	-0.013	-0.013	-0.018	-0.026*
	[0.028]	[0.008]	[0.008]	[0.008]	[0.017]	[0.015]
RESERVES	0.027	0.035	0.052***	0.052***	0.018	0.049
	[0.041]	[0.024]	[0.014]	[0.016]	[0.047]	[0.047]
INFLA(-1)	-0.836*	-0.838*	-1.004**	-1.019**	-0.268	-0.383
	[0.442]	[0.430]	[0.456]	[0.498]	[0.667]	[0.687]
OPEN	-0.054*	-0.052*	-0.052*	-0.052	-0.085*	-0.03
	[0.029]	[0.027]	[0.027]	[0.032]	[0.049]	[0.089]
R-squared	0.73	0.72	0.73	0.72		
Observations	218	218	220	220	172	172
J-Statistic (p-value)	0.600	0.706	0.367	0.429	0.478	0.413
AB-Statistic (p-value)					0.440	0.850
Cragg-Donald statistic	1.199	4.494	9.579	9.579	...	...
PRIVLOANS:						
CLR test (p-value)	...	0.000	0.000	0.000	...	...
CLR test (interval)	...	[2.50, 7.12]	[2.32, 6.14]	[2.32, 6.14]	...	...
LIML (point estimate)	3.955***	4.002***	3.657***	...	...	...
LIML (s.e.)	1.628	1.622	1.405	...5	...	...

Notes on Table 1:

Column (1): Both $PRIVLOANS$ and $PUBLOANS$ instrumented, GMM estimation. **Column (2):** Only $PRIVLOANS$ instrumented, GMM estimation, large set of instruments. **Column (3):** Only $PRIVLOANS$ instrumented, GMM estimation, reduced set of instruments. **Column (4):** Only $PRIVLOANS$ instrumented, LIML estimation, reduced set of instruments. **Column (5):** Arellano-Bond (1991) estimator, small number of lags. **Column (6):** Arellano-Bond (1991) estimator, large number of lags.

Standard errors in parantheses, based on a robust covariance matrix. ***, **, *: significance levels of 1, 5,

10 percent. The coefficients of the time dummies and the constant (not shown) are available upon request. The J-statistic refers to the Hansen-Sargan test of the overidentifying restrictions. The AB-statistic refers to the Arellano-Bond test for second-order autocorrelation in the first-differenced residuals. The Cragg Donald (1993) statistic is an indicator of instrument weakness as described in the text. The CLR test is the conditional likelihood ratio test of the significance of the coefficient of the endogenous variable (available only for the case of a single endogenous variable). LIML point estimates and standard errors correspond to the estimate of the coefficient of PRIVLOANS when the specification is estimated using the LIML estimator (with robust standard errors). Column (4) shows the full LIML estimate of the specification estimated (by GMM) in column (3).

Table 2: Varying specifications

	(1)	(2)	(3)	(4)	(5)	(6)
PRIVLOANS	2.734**	4.204***	3.471***		2.309**	1.872**
	[1.054]	[1.451]	[1.202]		[0.942]	[0.873]
IICCR(-1)	0.450***	0.348***	0.397***	0.409***	0.439***	
	[0.082]	[0.105]	[0.078]	[0.088]	[0.069]	
GOVSTABILITY	2.225***	2.520***	2.294***	2.432***		1.78
	[0.413]	[0.467]	[0.643]	[0.517]		[1.666]
PUBLOANS	0.294*	0.276	0.281*		0.158	-0.125
	[0.148]	[0.193]	[0.155]		[0.154]	[0.946]
INCOME	4.127***	4.945***	4.552***	2.576*	3.874***	0.428
	[1.301]	[1.601]	[1.499]	[1.517]	[1.040]	[4.661]
GOVDEBT	-0.013	-0.013	-0.013	-0.021*	-0.009	-0.068
	[0.008]	[0.009]	[0.009]	[0.013]	[0.007]	[0.157]
RESERVES	0.046***	0.059***	0.052***	0.050***	0.034***	-0.006
	[0.014]	[0.017]	[0.014]	[0.017]	[0.011]	[0.093]
INFLA(-1)	-0.635	-1.048*	-1.000**	-0.441	-0.674*	0.312
	[0.529]	[0.536]	[0.441]	[0.459]	[0.375]	[1.631]
OPEN	-0.04	-0.068**	-0.052*	0.006	-0.045*	-0.031
	[0.027]	[0.034]	[0.028]	[0.022]	[0.023]	[0.047]
CREDREG	0.499					
	[0.406]					
LATITUDE		-0.003				
		[0.003]				
GOVERNANCE			0.164			
			[1.500]			
PRIVDEBT				0.861***		
				[0.317]		
IPROFILE					2.317***	
					[0.378]	
R-Squared	0.8	0.67	0.74	0.68	0.84	0.78
Observations	220	220	220	215	220	50
J-Statistic (p-value)	0.26	0.62	0.14	0.23	0.67	0.90
Cragg-Donald statistic	11.11	10.09	8.38	10.35	6.22	5.51

Notes on Table 2:

Column (1): $CREDREG$ used as included instrument. **Column (2):** $LATITUDE$ used as included instrument. **Column (3):** $GOVERNANCE$ used as included instrument. **Column (4):** Initial *stock* of private foreign *debt* instead of average private *borrowing* used as regressor. **Column (5):** $IPROFILE$ instead of $GOVSTABILITY$ used as regressor. **Column (6):** Moody's sovereign rating instead of $IICCR$ used as regressor. **Further notes:** See Table 1

Table 3: Varying Samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PRIVLOANS	3.226***	4.822***	5.478**	2.571***	3.412**	4.146***	3.327***
	[0.993]	[1.625]	[2.121]	[0.647]	[1.290]	[1.407]	[1.162]
IICCR(-1)	0.330***	0.404***	0.377***	0.482***	0.431***	0.374***	0.405***
	[0.099]	[0.093]	[0.113]	[0.079]	[0.126]	[0.127]	[0.101]
GOVSTABILITY	2.644***	2.273***	2.310***	2.823***	2.497***	2.650***	2.225***
	[0.506]	[0.455]	[0.490]	[0.491]	[0.606]	[0.623]	[0.817]
PUBLOANS	0.441	0.18	0.154	0.154	0.149	0.138	0.086
	[0.292]	[0.171]	[0.167]	[0.185]	[0.196]	[0.211]	[0.197]
INCOME	4.790**	4.401***	3.340**	3.237**	3.880**	4.615**	4.005**
	[1.878]	[1.507]	[1.517]	[1.434]	[1.736]	[1.903]	[1.594]
GOVDEBT	-0.055**	-0.011	-0.015	-0.005	-0.01	-0.01	-0.01
	[0.021]	[0.009]	[0.010]	[0.006]	[0.007]	[0.008]	[0.007]
RESERVES	0.025	0.053***	0.059***	0.062***	0.056***	0.060***	0.056***
	[0.026]	[0.016]	[0.019]	[0.014]	[0.015]	[0.016]	[0.014]
INFLA(-1)	-0.972	-0.822*	-0.898	-1.287***	-0.604	-0.7	-0.774
	[0.596]	[0.467]	[0.609]	[0.462]	[0.621]	[0.565]	[0.470]
OPEN	-0.068*	-0.031	-0.007	-0.049**	-0.046	-0.059*	-0.049*
	[0.036]	[0.024]	[0.021]	[0.022]	[0.032]	[0.032]	[0.027]
CREDREG					0.2		
					[0.527]		
LATITUDE						-0.003	
						[0.003]	
GOVERNANCE							1.006
							[1.649]
R-Squared	0.7	0.69	0.68	0.82	0.76	0.69	0.77
Observations	163	218	199	178	178	178	178
J-statistic (p-value)	0.41	0.35	0.42	0.09	0.33	0.83	0.37
Cragg and Donald statistic	7.74	7.50	6.13	16.18	9.24	8.69	7.92

Notes on Table 3:

Column (1): Omission of observations with $PRIVLOANS = 0$. **Column (2):** Omission of observations with $PRIVLOANS > 15$. **Column (3):** Omission of transition economies. **Column (4):** Omission of 1980s. **Column (5):** Omission of 1980s and $CREDREG$ used as included instrument. **Column (6):** Omission of 1980s and $LATITUDE$ used as included instrument. **Column (7):** Omission of 1980s and $GOVERNANCE$ used as included instrument. **Further notes:** See Table 1

Figure 1

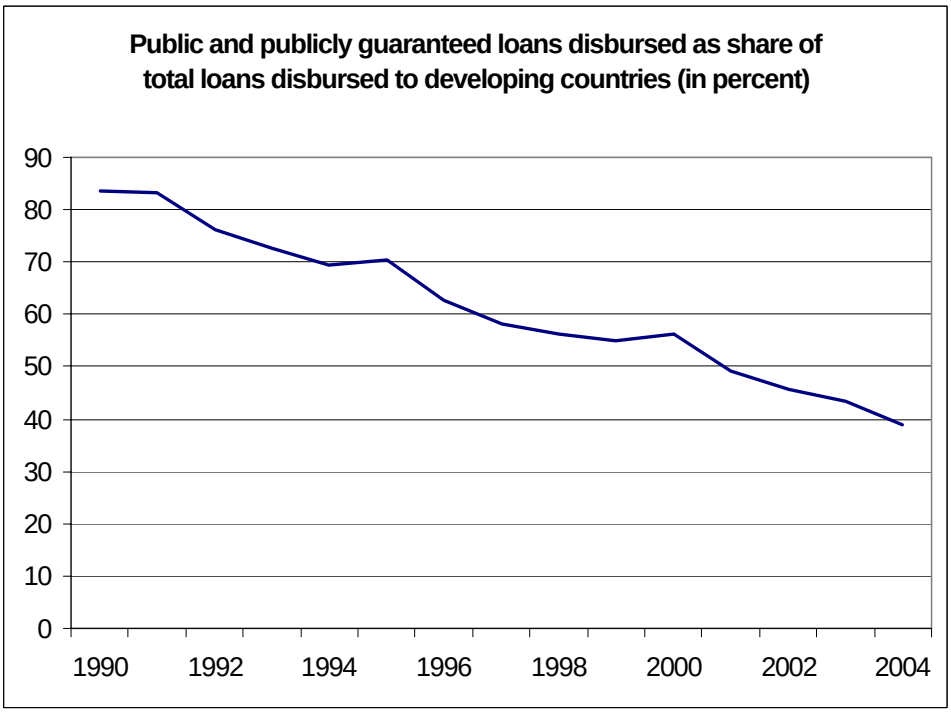


Figure 2

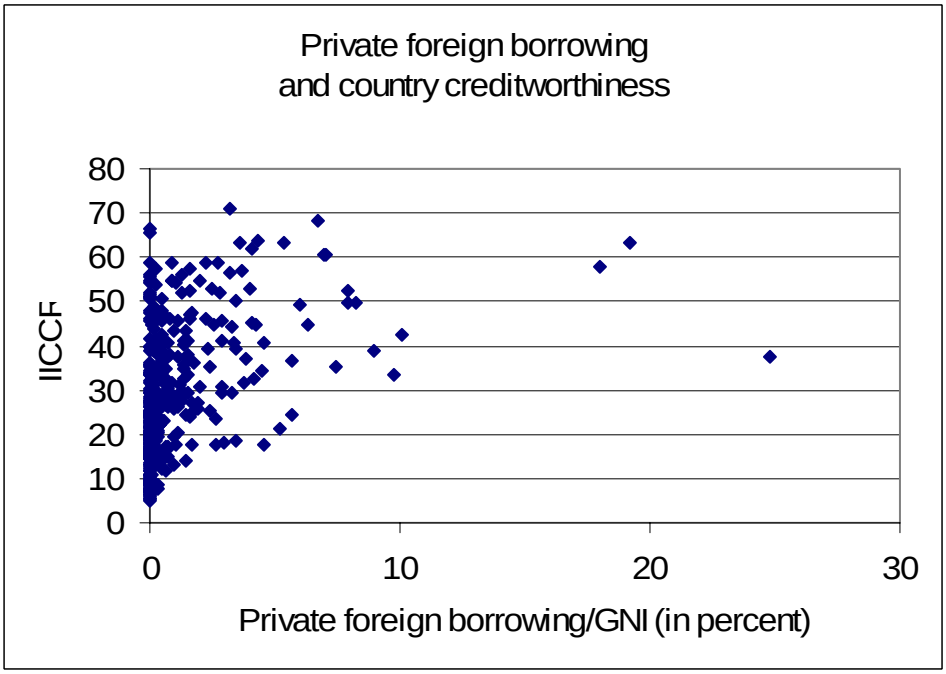
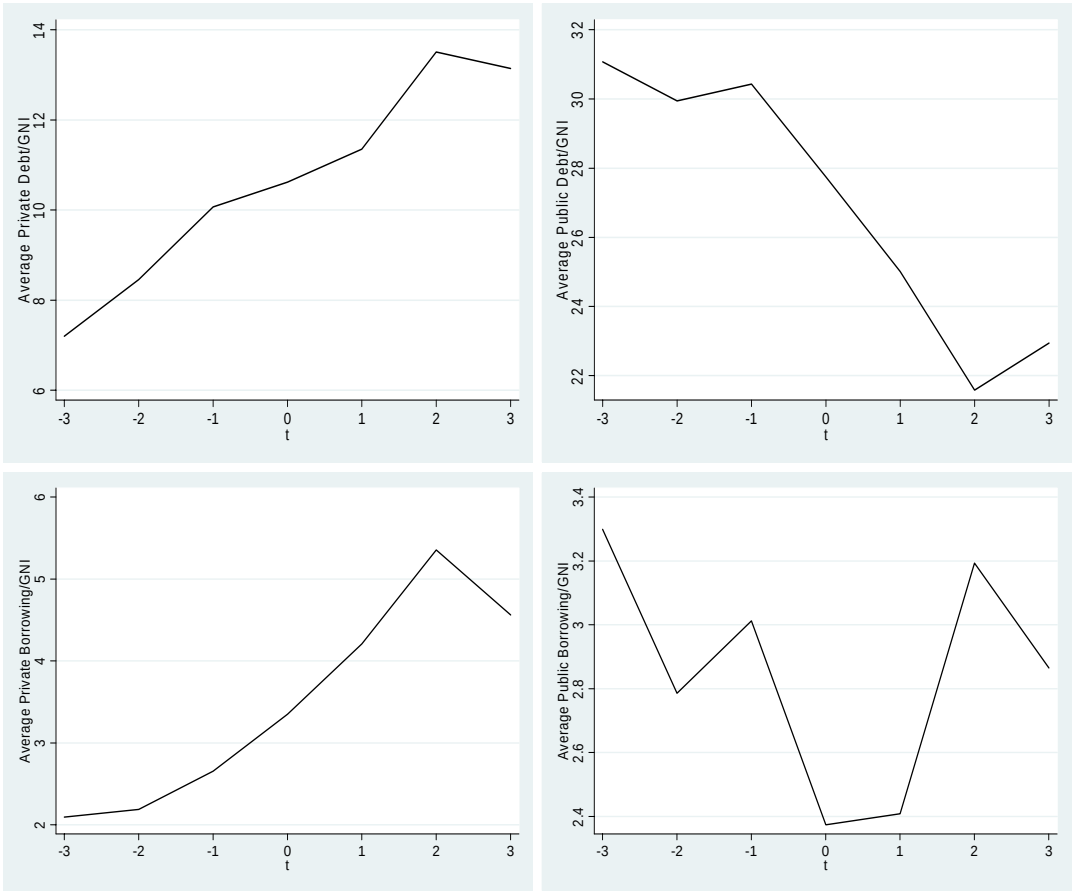


Figure 3 . Average public and private external debt and borrowing before and after Moody's sovereign rating increases (percent of GNI).



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

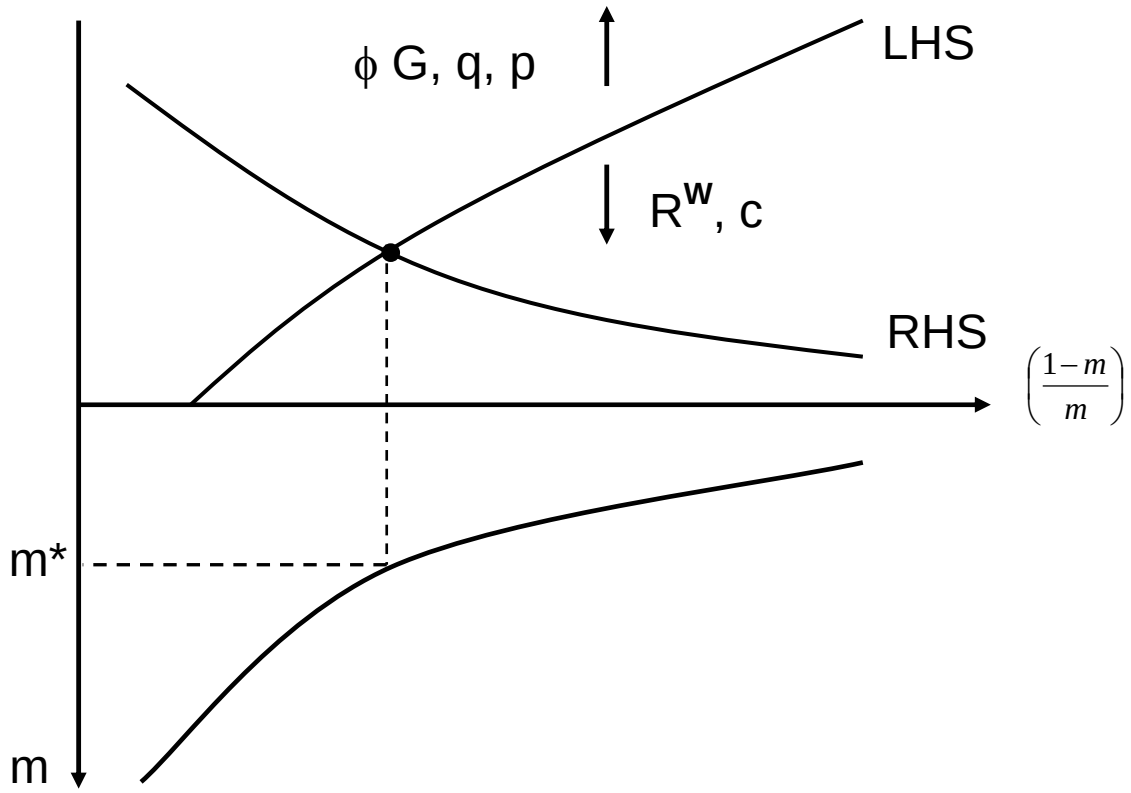


Figure 5

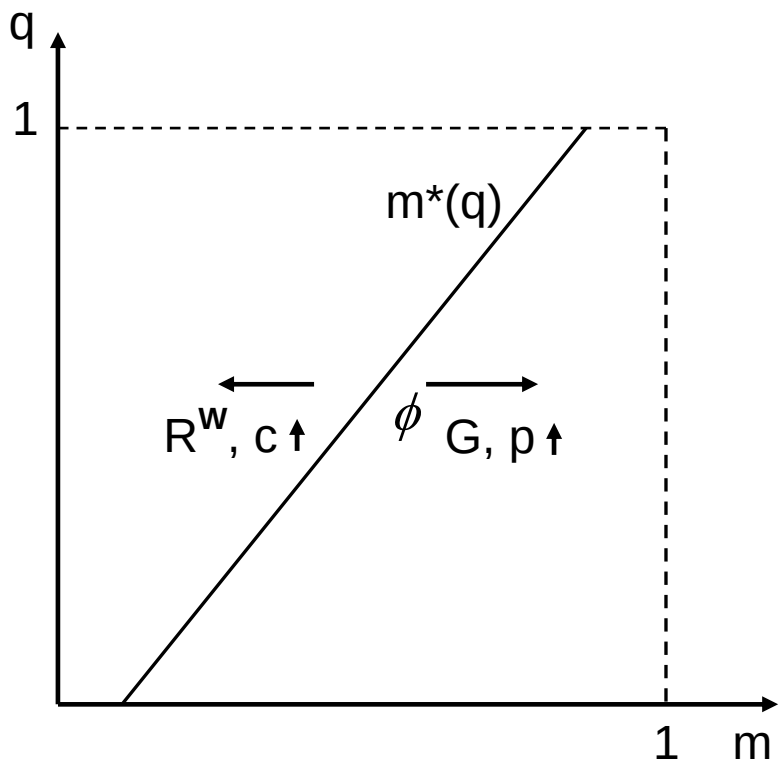


Figure 6

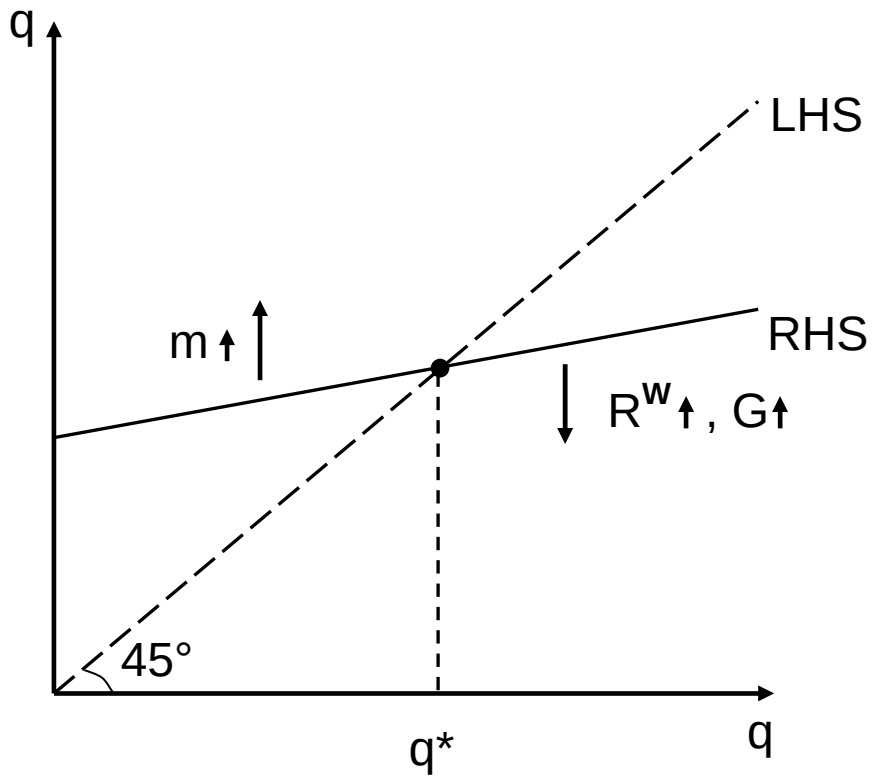


Figure 7