Debt Forgiveness and Sovereign Credit Ratings in Developing Countries

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Abstract:
Although debt forgiveness for developing countries has claimed an increasingly prominent role in development policy, its efficacy remains in question. This study examines one particular goal of debt forgiveness: encouraging external investment by easing the incentive problems associated with large debt stocks. I assess the impact of debt forgiveness on creditor sentiments, using Institutional Investor sovereign credit ratings as a proxy for creditor outlook. Using a dataset of a broad sampling of developing countries over the last twenty-five years, I find that although large external debt stocks have a significant negative effect on credit ratings, debt forgiveness has not had any significant impact in improving them, likely as a consequence of significant reborrowing by developing countries and larger aid flows outside of debt forgiveness.

KEYWORDS: Debt forgiveness, debt relief, sovereign credit ratings

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1. Introduction

Debt forgiveness has been deployed in one form or another for the past thirty years, but it has come to the forefront of development policy during the last decade. In 1996, the World Bank and International Monetary Fund (IMF) launched the HIPC (Heavily Indebted Poor Countries) Initiative, designed to relieve the unsustainable debt of the poorest countries in the world. Events like the “Live 8” concert series and the Jubilee Debt Campaign have brought this development tool to the attention of the mainstream media and public. Successive G8 meetings granted increasingly more generous forgiveness terms, culminating in the 2005 Gleneagles G8 meeting where 100% of the debt owed to the World Bank and IMF by graduates of the HIPC program was forgiven. Despite the growing deployment of this development tool, however, the actual ability of debt relief to help the poor remains under intense debate.

The message of the recent debt forgiveness campaign has focused on the alleged scandal of poor countries paying interest to rich countries. This moral argument is unfortunately supplemented by the simple fact that, whether or not they should, poor countries have in general not been able to repay in full the debt to their public and private creditors since the debt crisis in 1982. Several economists have argued that large debt stocks create incentive problems – what they termed “debt overhang” problems – among both creditors and the debtor government, and they argued that debt forgiveness could encourage private financing by restoring the proper incentives.

However, the link between large debt stocks and foreign investment stagnation does not necessarily require that debt forgiveness will promote physical capital accumulation. For example, prolonged debt forgiveness negotiations can add to the existing investor uncertainty over lending, and debt stock forgiveness will likely have little effect if it is matched by equal
borrowing. This study examines whether debt forgiveness acts as a stimulant for investment in developing countries by analyzing how debt forgiveness, relative to other economic and institutional indicators, affects sovereign credit ratings. Sovereign credit ratings summarize the ability of a government to repay its external debt; a lower rating is typically complemented by a higher risk premium on loans to the government. These ratings thus govern the costs of borrowing by developing countries and consequently their access to international capital markets.

Credit rating changes after debt forgiveness cannot be wholly attributed to the debt stock reduction alone, however. In order to see how significant the external debt stock is in determining credit ratings, this study begins with a decomposition of the sovereign credit ratings issued biannually by the magazine *Institutional Investor*. I constructed a panel dataset consisting of the credit ratings and economic fundamentals of a large set of developing countries from 1980 until 2004. Using regression analysis, I am able to determine the relative contributions of various economic variables to a credit rating. My results agree with previous literature in that the economic fundamentals and political risk of the countries in my sample strongly explain their credit ratings. Most importantly, I find that a country’s external debt stock has a highly significant negative effect on its sovereign credit rating, supporting the argument that large debt stocks present a capital accumulation problem for developing countries.

I then look to see what effect debt forgiveness has on credit ratings. While debt forgiveness should in theory help credit ratings indirectly by lowering the external debt stock of a country, it can also have direct effects, such as by changing borrowing and lending behavior. Again using regression analysis, I estimate these indirect and direct effects. Despite the
significance of debt stocks to sovereign credit ratings, I find that debt forgiveness has no significant direct or indirect effect on credit ratings.

To understand why debt forgiveness has not worked in practice, I consider variables that could confound the effect of debt forgiveness. I focus on the role of corruption, other aid flows, reborrowing behavior, and the quantity of debt forgiveness provided. These four arguments are frequently argued in explaining the inefficacy of debt forgiveness in accomplishing other development goals.

My analysis is guided by past literature on credit ratings and debt forgiveness. Harms and Rauber’s (2005) study of how foreign aid affects countries’ creditworthiness was particularly influential. My choices of explanatory economic fundamentals, data sources, country set, and empirical method were strongly inspired by the authors’ corresponding choices. Sachs (1989) and Krugman (1989) largely provided the theoretical basis for my study, and Sachs’ debt overhang model is presented in Section 3. Past work has been done on the effect of debt forgiveness on investment behavior (see Chauvin and Kraay [2005]). My study is the first, however, to examine debt forgiveness’s effect on investment using sovereign credit ratings as a proxy. My dataset tracks the Institutional Investor credit ratings of a large sample of countries since the magazine began issuing credit ratings; my study thus also presents the most up-to-date analysis of how economic fundamentals explain credit ratings.

The rest of this study is as follows: Section 2 presents the historical context and past work on debt overhang, debt forgiveness, and sovereign credit ratings; Section 3 presents Sachs’ theoretical model of debt overhang; Section 4 describes my dataset, empirical estimation, and results; Section 5 considers confounding factors; and Section 6 summarizes my findings and concludes.
2. Historical Context and Past Work

The Debt Problem and Proposed Solutions

The current global debt problem predominantly stems from the debt crisis that struck Latin America and Africa in 1982. This crisis developed as a consequence of irresponsible behavior by both creditors and debtor governments. During the 1970s, facing low and even negative real interest rates and periods of high growth, many Latin American countries pursued expansionary fiscal policies, running large fiscal deficits and financing them by borrowing. Given the profitable investments and the “bankrupt-proof” nature of countries, creditors were more than happy to lend and turn over the oil revenues that flooded the market from the two 1970s oil crises. However, this excessive borrowing soon became much more expensive as export growth slowed and interest rates rose with tightened monetary policies in developed countries. Worsening terms-of-trade contributed to the inability to repay these debts. In Africa, even low-interest loans from bilateral sources and development banks could not be repaid as income and exports remained static and commodity prices declined (Moss 5).

Fearing global financial collapse as a result of this crisis, economists turned their attention to addressing the debt crisis. Despite the fact that debtor countries were meeting their interest payments for several years, it became clear that these debts were unsustainable without additional assistance. Economists reasoned that this assistance could take three forms: (1) official lending; (2) debt forgiveness; and (3) private financing. Official lending was judged as less preferable than private lending, and debt forgiveness presented many problems (discussed later). For the first several years, the debt crisis was to be handled through new private lending and debt rescheduling (Sachs 81; Krugman 300).
However, this new lending was not forthcoming despite good investment opportunities. The reason for this, as Krugman (1989) and Sachs (1989) demonstrate, was incentive distortions caused by the large debt stock – what they term “debt overhang” problems. In the face of large debt stocks, the incentives of both creditors and debtors were skewed and consequently led to an undersupply of credit – a liquidity problem generated by fear of insolvency (Krugman 302). Just as with firms, it is beneficial to deal with a sovereign insolvency problem early because simply being insolvent is costly through these skewed incentives.

Sachs describes three particular costs to insolvency. First, insolvency generates a “grab race” by creditors for their repayments instead of more efficient communal action. Second, facing a insolvent sovereign with large debt stocks, creditors will withhold resources due to fears that the debtor will employ distortionary measures such as taxes on returns to capital, inflationary policy, or currency devaluation to accrue funds for repayment (Moss and Chiang 3). Third, debtors face perverse incentives in repayment. Generally, new creditors will require a high premium on interest rates, itself decreasing the incentive to repay. Additionally, a large debt stock provides the country with a disincentive to adjust economic and institutional policies to improve its external position. As Sachs (1989), notes, “Why should a country adjust if that adjustment produces income for foreign banks rather than for its own citizenry?” Since a large fraction of export earnings must be redirected to debt servicing, Sachs argues, a large debt stock acts as a high marginal tax on externally-oriented policy reform (257-8).

The 1985 Baker Plan was the first major attempt to address the crisis, exchanging medium-term structural adjustment for new loans from commercial banks. The disincentives to private financing of debt show us in hindsight why this initial strategy to stem the debt crisis, focusing exclusively on new private lending and rescheduling, failed. Debt ratios in developing
countries rose steadily until 1988, when they plateaued. Around this time, as economists realized that private financing would not sufficiently ease the debt crisis, partial debt forgiveness became increasingly attractive.

The hesitation to grant partial debt forgiveness was motivated by a number of incentive distortions with this solution as well. The primary problem with debt forgiveness is the inherent moral hazard involved. When debt forgiveness is a widespread or even just possible treatment for a large debt stock, there is an incentive for countries to build up large debt stocks. Furthermore, if debt forgiveness comes at the expense of governments or multilateral institutions instead of private lenders, debt forgiveness will promote irresponsible lending as banks conclude that governments will bail them out in future crises (Krugman 326). Debt forgiveness had been granted before the debt crisis, clearly with limited results. From 1977 to 1979, the United Nations Conference on Trade and Development forgave $6 billion in debt to forty-five poor countries, including elimination of interest payments, debt service rescheduling, and grants (Easterly [2001] 124-5).

Despite this moral hazard problem, partial debt forgiveness was seen as a way not only to reduce debt stocks to avert financial collapse but also as a means of reducing the debt overhang distortions preventing private lending. According to Sachs (1989), since a large debt stock lowers the incentive for the debtor to repay existing debt or for creditors to lend to the indebted country, writing down the debt to a level that will actually be paid will eliminate the costs associated with fears of insolvency. Sachs’ model of debt forgiveness as a treatment for debt overhang problems is presented in section 3 of this study.

Debt forgiveness became the basis of the 1989 Brady Plan, which called on commercial banks to reduce the value of their claims on a case by case basis in return for a guarantee on the
remaining balance of the claim and collateral offered by the World Bank and IMF. Reductions occurred by converting debt into bonds at lower principal or interest rates, swapping debt for equity. This plan significantly bolstered the stability of debt-burdened countries.

However, large debt stocks remained and two problems emerged. First, for a number of countries, interest payments on old debt meant fewer resources to dedicate to development ends like education, health, or infrastructure. The World Bank and IMF consequently launched the HIPC Initiative to address the debt burdens of the world’s poorest countries. Second, a “lend and forgive” cycle began to emerge, as new borrowing by indebted countries soon exceeded their previously forgiven debt stocks. To address both these problems, at the 2005 Gleneagles G8 summit, a program was deployed to provide 100% forgiveness on debt to the World Bank and IMF for countries that graduated from the HIPC program, thereby eliminating the debt burden of countries that had achieved macroeconomic stability and halting the “lend-and-forgive” cycle.

Yet almost twenty years since debt forgiveness became an integral part of development policy, there is still reason to be skeptical of its efficacy. From 1989 to 2003, developing countries have received $100 billion in debt relief (Chauvin and Kraay 1). However, several studies have failed to find a link between debt relief and an improved external position, increased development spending, or improved development outcomes. Hernandez and Katada (1996) failed to find an effect on import capacity when analyzing ODA debt relief to African countries from 1989 until 1993. More indicting is Chauvin and Kraay’s (2005) study of debt forgiveness for 62 developing countries from 1989 until 2003. They failed to find any evidence of a positive impact on public spending, GDP growth, policy quality improvement, or, particularly important for the purposes of this study, investment rates. In other words, they found no evidence that debt
forgiveness in practice addressed any of the problems which prompted the theoretical arguments for debt forgiveness. I return to Chauvin and Kraay’s study at several points in this study.

There are a few reasons that debt forgiveness has not worked in practice, which this study considers in Section 5. One reason is that HIPC countries have been able to secure lending even as their debts are being written off. In fact, Easterly (2001) notes that HIPC countries, to whom roughly $50 billion of the $100 billion in debt forgiveness has been granted from 1989 to 2003, borrowed enough new funds during the 1980s and 1990s to offset past debt forgiveness (Easterly [2001] 21-22). This undermines the argument that indebted countries face a liquidity problem and are directing money to interest payments at the expense of development ends. This fact also seems to support the concern that debt forgiveness shouldered by public entities leads to irresponsible new lending and borrowing.

Furthermore, since money is fungible, “debt relief goes into the same government account that rains money on good and bad uses alike” (Easterly [2001] 22). Until the HIPC initiative was deployed, corruption was not a major barrier to forgiveness, leading to embarrassing stories of extravagance in countries granted debt forgiveness. President Mobutu Sese Seko of Zaire, for example, personally took up to $5 billion of lending to his country; the Ivory Coast built two new capitals in the hometowns of previous rulers while accumulating debt (Thomas 2; Easterly [2001] 21). Even under HIPC, corruption remains a problem. Corruption indicators measured by Kaufman, Kraay and Mastruzzi declined for HIPC countries from 1996 to 2004, most of the lifespan of the HIPC initiative (Lala 26-7).

Continued borrowing by debtors and corruption in debtor countries are only two complications in the deployment of debt forgiveness. Chauvin and Kraay (2005) also point to the interaction of aid flows with debt forgiveness flows as a factor that could potentially contribute
to debt forgiveness’s failure to address debt overhang problems. If debt forgiveness replaces existing aid flows instead of being additional to them, investors may not be affected by the forgiveness. Finally, proponents of debt forgiveness have responded to its failures by calling for more, arguing that debt forgiveness issued so far is only a small fraction of the total debt of developing countries and has thus not had a significant impact. This study will later consider these four complications and their ability to address my finding that debt forgiveness has had no significant effect on a country’s credit ratings.

Sovereign Credit Ratings

Sovereign credit ratings are forward-looking estimates of central governments’ default risks, assessing the credit risk of government debt just as corporate credit ratings assess the credit risk of corporate bonds. The demand for sovereign credit ratings has dramatically grown as a consequence of the financial integration of the past fifteen years, which led to strengthened market and financial institutions in rapidly growing emerging market economies. Investors have increasingly been directing credit towards opportunities in emerging markets and developing countries have increasingly been relying on foreign borrowing to finance growth.

Sovereign credit ratings are issued by a number of rating agencies – Moody’s, Standard and Poor’s, Institutional Investor magazine, and the Economist Intelligence Unit are among the most influential – in the form of a single letter or number grade. These ratings provide investors with an at-a-glance summary of a country’s credit risk. These ratings are relied on to the extent that many investors in developed countries are allowed to invest only in countries that meet a certain credit rating threshold (Haque et al. [1997] 10; Harms and Rauber 1). A lower credit rating is associated with a higher investment yield demanded by investors. In fact, Cantor and
Packer (1996) find that positive or negative credit rating announcements significantly lower or raise bond spreads, respectively. Since sovereign credit ratings are so heavily relied upon by investors, they significantly affect developing countries’ cost of borrowing and consequently their access to international capital markets. (In Graph 1, we see that private capital flows have largely responded to credit ratings, particularly since 1990.) Furthermore, Cantor and Packer (1996) and Standard and Poor’s (2004) point out that nonsovereign entities – local municipalities, provincial governments, or private firms – rarely have credit ratings higher than that of the country of residence. Sovereign credit ratings are thus relevant for credit to private entities as well.

Given their relevance in international finance, it is important to understand how credit ratings are decided upon and whether they can be well and consistently explained by economic variables. Several studies explore how well a country’s fundamental macroeconomic variables explain its credit rating. Standard and Poor’s (2004) offers a primer on their rating methodology, including the categories considered by their ratings. However, as they note, several of the factors are qualitative, and relative weights among the factors vary among sovereigns and across time. There is thus no exact formula for determining their ratings. Haque et al. (1997) find that the judgment of the rating analysts is very influential and that “a fair amount of subjective judgment goes into the final evaluation” (10-11). Besides their formulas, different rating institutions employ wholly different methodologies to determine their ratings. While Moody’s and Standard and Poor’s provide their own credit ratings, Institutional Investor magazine, which this study uses for its credit ratings, combines the individual responses of 75 to 100 leading banks that grade each country and weights the responses with greater worldwide exposure more heavily.
Since ratings institutions do not provide formulas for their credit ratings, several studies use regression analysis to determine the relative contribution of different economic variables to a country’s sovereign credit rating, including GDP and export growth, international reserves, external debt stock, among others. While there is broad overlap in which variables are particularly influential, there are some contradictory findings across the studies. Feder and Uy (1984) try to explain *Institutional Investor* credit ratings using Debt/GNP, International Reserves/Imports, Export and GDP growth rates, terms of trade, per capita income, export vulnerability to shocks, and dummy variables for oil exporters, political turmoil, and debt servicing difficulties. They found that all variables were highly significant. On the other hand, Cantor and Packer (1996) try explaining Moody’s and Standard and Poor’s credit ratings and find that GDP growth, fiscal balance, and current account balance are all not significant in explaining credit ratings. Haque et al. (1997), meanwhile, find that currency account balance is one of the factors that most influences ratings. This study presents a similar regression analysis in an effort to explain *Institutional Investor* credit ratings.

3. Theoretical Model

In this section I present Sachs’ debt overhang model from his classic paper “The Debt Overhang of Developing Countries” (1989), which provides a theoretical basis for the incentive problems caused by large debt stocks.

Consider a debtor country in a two-period economy. It enters period 1 with an existing debt stock D due during period 2, and it wants to maximize the utility function:

$$U(C_1) + bU(C_2)$$

The economy has production functions:
\[ Q_1 = F(K_1) \] \hspace{1cm} (2)

\[ Q_2 = F(K_2) = F(K_1 + I_1) \]

Where \( K_1 \) is the capital stock in period 1, \( K_2 \) is the capital stock in period 2, \( I_1 \) is the investment in period 1, and \( Q_1 \) and \( Q_2 \) are the country’s production income in the two periods.

We assume that the country is able to negotiate an agreement with its creditors over its debt stock \( D \) that the amount it will repay \( (S) \) is, at a maximum, a fraction \( z \) of its income. If the total amount of debt the country owes its creditors by period 2 \( (T) \) is less than this fraction, it will pay the entire debt off. If \( T \) is greater than this fraction, it will pay \( zQ_2 \).

\[ S = zQ_2 \text{ if } T > zQ_2 \] \hspace{1cm} (3)

\[ S = T \text{ if } T \leq zQ_2 \]

In period 1, the debtor country faces two creditor actions:

1) New creditors may loan in the amount \( D_1 \) at interest rate \( r \), due in period 2

2) The original creditors, currently owed the existing debt \( D \), may partially write down their repayment amount to \( R \)

Thus, in period 2, the total amount the country owes its creditors \( (T) \) is:

\[ T = (1 + r)D_1 + R \] \hspace{1cm} (4)

We consider these two actions in turn:

1) **Lending by New Creditors**

   We assume that new creditors will only extend loans if they will be repaid in full in period 2. We know that if \( T \leq zQ_2 \), the country will repay its entire debt stock.

   In other words, new creditors will extend loans in period 1 if:

   \[ (1 + r)D_1 + R \leq zQ_2 \] \hspace{1cm} (5)
New creditors will base their lending on Q2, which in turn depends on the country’s investment in period 1, $I1$. The country will invest as a function of the loans they receive in period 1 and the long-term debt they owe, $R$.

$$I1 = I1(D1, R)$$

Equation (5) is now:

$$(1 + r) D1 \leq z F[K1 + I1(D1, R)] - R$$

Equation (6) thus defines a lending limit for new creditors. $D1$ in terms of the existing debt $R$. As $R$ increases, $I1$ and consequently $F$ decrease, causing $D1$ to decrease. Thus, $D1$ is a decreasing function of $R$.

$$D1 \leq h(R)$$

There thus exists an $R*$ such that for $R > R*$, $D1 = 0$. $R*$ is the existing debt level at which new creditors will not lend because they will not be repaid in full.

(2) Debt Forgiveness by Original Creditors

The original creditors, faced with the option of partially forgiving the debt $D$ to a level $R$, have the goal of choosing $R$ so as to maximize their ultimate repayment:

$$\max R \quad S - (1 + r) D1$$

where again $S$ is the amount the debtor pays to all its debtors in period 2, and $(1 + r) D1$ is the repayment to the creditors of period 1.

Meanwhile, the debtor, facing the constraint:

$$D1 = I1 + C1 - Q1$$

maximizes utility $U(C1) + bU(C2)$ after the original creditors select their new repayment amount $R$. 

14
We first consider the case where $R = D > R^*$, in other words when no forgiveness is extended and the debt owed the original creditors exceeds the level at which new creditors will lend in period 1. Consequently, $D_1 = 0$

We face the optimization:

$$\text{max } U(C_1) + bU(C_2) \text{ s.t.}$$

$$C_1 = F(K_1) - I_1$$

$$C_2 = F(K_1 + I_1) - S$$

Since $R > R^*$, the debt amount exceeds the amount serviceable by the debtor country’s income, so $S = zQ_2 = zF(K_1 + I_1)$

Thus: $C_2 = (1 - z) F(K_1 + I_1)$

The solution to this optimization is given by the equation:

$$U'(C_1) = (1 - z) F'(K_1 + I_1) bU'(C_2)$$

The second case we consider is when the original debt is written down to the level at which the debtor country serviced its debt in the first case. In this case the debtor country can service the entire debt.

$S'$ is now a lump-sum quantity instead of a fraction of production income, and thus in the optimization it drops out as a constant. The new solution to the optimization is given by the equation:

$$U'(C_1) = F'(K_1 + I_1) bU'(C_2)$$

Since $F'$ is a decreasing function, we know that in equation (10) $I_1$ is greater. Thus the debtor country demands more investment and consequently has larger second period production ($Q_2$) as a result of the debt forgiveness. Thus, creditors are repaid the same amount in the two cases, while the debtor country is better off in the latter case.
The operational difference is the quantity the debtor repays. When no forgiveness is extended, the debtor country invests under the knowledge that \( zF(K1 + I1) \) will be repaid to creditors. When forgiveness is extended, and the debt burden is reduced to the precise level the country chose to repay when no forgiveness was extended, the debtor country will choose invest more in period 1 knowing that the repayment amount is fixed. The debt stock that exceeds what is repayable acts as a tax on investment. By reducing the debt burden to an amount that will be repayable, the debt is now a lump-sum burden instead of a marginal tax.

This model suggests that if countries are likely unable to pay off their debts, forgiving their debts can leave creditors just as well off while improving the condition of the debtor country. This, however, carries important assumptions that conflict with the experience of debtor countries. First, the model assumes that countries with existing high levels of debt will be unable to secure new borrowing, while in practice new borrowing has come easily to debtor countries. Second, this model is also absent of aid flows which may dwarf debt flows and complicate the investment decision of the debtor country. Finally, this model does not consider other effects of debt forgiveness, such as the signal it might send to creditors or the moral hazard issues involved. The next section empirically evaluates the impact of debt forgiveness over the past twenty-five years to see how well this model has applied to debt forgiveness in practice.

4. Empirical Analysis

In this section I describe the empirical methods I employ to explain the determinants of sovereign credit ratings and assess the impact of debt forgiveness on these ratings. I will first describe my dataset and the constituent data. Then I will present my estimation of the
determinants of sovereign credit ratings and explain the results, then present the estimation of the impact of debt forgiveness and finally the results.

Data

To estimate the determinants of credit ratings and the credit rating impact of debt forgiveness, I constructed a panel dataset of 78 developing countries tracking the countries’ sovereign credit ratings, debt forgiveness, and a variety of macroeconomic and institutional indicator variables from 1980 to 2004. My selection of sample countries and macroeconomic variables was largely motivated by Harms and Rauber’s (2005) study on the impact of foreign aid on sovereign credit ratings. A list of the countries in my sample can be found in Chart A, a summary of data definitions and sources can be found in Chart B, and summary statistics of all my variables are listed in Table 1a and Table 1b.

1. Sovereign Credit Ratings

I use Institutional Investor magazine as my source of sovereign credit ratings. Institutional Investor magazine has been publishing sovereign credit ratings every six months (in March and September) since 1979. A country’s credit rating is between 0 and 100, with 100 representing the smallest credit risk. 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]). Institutional Investor conducts a survey of 75 to 100 leading banks, each of which rates each country on the 0 to 100 scale. Institutional Investor then averages the ratings, placing more weight on banks with greater market exposure
(Haque et al. [1997] 11). My dataset only includes those countries that had credit ratings issued since 1979.

The *Institutional Investor* credit ratings had to be transformed in two ways. First, since they are issued biannually, whereas macroeconomic variables are generally only available annually, I averaged the March and September ratings for an annual sovereign credit rating. Secondly, since *Institutional Investor* credit ratings have an upper and lower bound, the credit ratings needed to be transformed such that credit ratings predicted by my regression would not exceed those bounds. Feder and Uy (1984) describe a logistic transformation that makes the estimation compatible. This transformation is also used by Harms and Rauber (2005):

Since *Institutional Investor* credit rating (IICR) is on a scale of 0 to 100, it can be represented as a probability from 0 to 1. Suppose the rating IICR could be modeled as a vector of indicator variables in the following way:

\[ IICR_{it} = \frac{e^{\beta X_{it} + \epsilon}}{1 + e^{\beta X_{it} + \epsilon}} \]  

(11)

where \( \beta \) is a vector of weights and \( \epsilon \) is the error term.

From equation (11) I get the following transformation:

\[ IICT_{it} = \ln \left[ \frac{IICR_{it}}{1 - IICR_{it}} \right] = \beta' X_{it} + \epsilon_{it} \]  

(12)

For every credit rating IICR there is a unique transformed credit rating IICT. I can use equation (11) for a reverse transformation. My results, however, still hold for untransformed credit ratings.

2. Debt Forgiveness

One of the main obstacles to this study is the difficulty in obtaining strong debt forgiveness data. Surprisingly, no comprehensive database accounting for all of the debt forgiveness developing countries have received from various sources (Paris Club, IFIs, or private
lenders) exists. Chauvin and Kraay (2005) voiced the same concern in their paper. The closest such database is the World Bank’s *Global Development Finance* database (GDF). All debt finance data in this study are from the GDF database.

The GDF reports data on debt forgiveness since 1989, which shortens my sampling period to 1989 to 2004. The data reported is derived from debtor-reported data on individual loans recorded in the Debtor Reporting System (DRS) database maintained by the World Bank (Chauvin and Kraay 31). Since the data is debtor-reported, it reflects in principle debt forgiven by all creditors. For debt forgiveness I use the GDF’s “Debt forgiveness or reduction”, which reflects debt principal and arrears forgiven, and “Interest forgiven”, which reflects interest payments forgiven over time (*Global Development Finance Vol. II*). Both Chauvin and Kraay (2005) and Daseking and Powell (1999) use the sum of these two fields as the face value of debt forgiven. To avoid double-counting, it is important to note that the total debt stock of a given country in a given year already reflects the debt forgiven in that year.

The principal drawback of this database is that the debt forgiveness flows do not capture debt forgiveness in the form of reductions in the present value of debt; they only capture debt forgiveness in the form of a reduction in the face value of debt. Thus, forgiveness of highly concessional and low- or non-concessional debt are treated the same. Chauvin and Kraay (2005) try accounting for this by assuming the average rate of concessionality on debt forgiveness is the same as the average rate of concessionality for the total debt stock outstanding, relying on another database for average concessionality rates. This database being unavailable, this study does not account for concessionality in debt forgiveness.
3. Macroeconomic Variables/Control Variables

Macroeconomic Variables

I test a number of macroeconomic and institutional variables that past literature, particularly Harms and Rauber (2005), suggests explain credit ratings. I then use these same variables as control variables in isolating the effect of debt forgiveness. This is necessary because debt forgiveness packages have been, especially of late, conditional on economic and institutional policy reforms. Some of these variables should have obvious effects in a particular direction, while the effect of other variables may be ambiguous.

The ratio of external debt stock to GDP ($DEBT$) is expected to have a negative effect on credit ratings. As discussed in Sections 2 and 3, high debt stocks create a disincentive for new lending and repayment. Higher debt stocks also increase the benefit of default.

The ratio of current account balance to GDP ($CA$) is expected to have a positive effect on credit ratings. A current account surplus indicates a country is accumulating foreign exchange reserves with which they it can repay its debt stocks. It is thus in a better position to repay its debt. However, countries that are expected to default and experience a credit rating crash is likely to experience significant capital flight, perversely generating a current account surplus. This may complicate results.

The annual growth of exports ($EXPGROWTH$) is expected to have a positive effect on credit ratings. As exports grow, a country’s access to foreign export reserves grows, improving its ability to service its external debt. Similarly, a country’s ratio of foreign exchange reserves to its imports ($RESERVES$) is expected to have a positive effect on credit ratings. The higher this ratio, the greater its proportion of its reserves free to service debt instead of imports.
The inflation rate (*INFLATION*), measured as the percent change in a country’s CPI, is expected to have a negative effect on the country’s credit rating, as it increases the nominal value of external debt and signals macroeconomic instability. On the other hand, GDP growth (*GROWTH*) is expected to have a positive impact on credit ratings, since it increases the tax base from which to pay debt and indicates macroeconomic stability.

Finally, the country’s trade level (*TRADE*), measured as the ratio of exports plus imports to GDP, is expected to have a positive impact on credit rating. This variable reflects a country’s integration in the global economic community and its trade openness.

Data on all of these macroeconomic variables are collected from the World Bank’s *World Development Indicators* database, except for *DEBT*, which is from the World Bank’s *Global Development Finance* database.

*Institutional Variables*

This study also uses a variable for economic governance (*GOV*). I use the Political Risk Service’s *International Country Risk Guide* (ICRG) database, which rates 22 risk components across rates three sets of country risk: political, financial, and economic risk. I use their twelve political risk components, which are, along with their respective scales:

- Government Stability (12)
- Socioeconomic Conditions (12)
- Investment Profile (12)
- Internal Conflict (12)
- External Conflict (12)
- Corruption (6)

- Military in Politics (6)
- Religious Tensions (6)
- Law and Order (6)
- Democratic Accountability (6)
- Bureaucratic Quality (4)
- Ethnic Tensions (6)
Government Stability, for example, is measured on a scale from 0 to 12, where 12 reflects greater stability, while the extent of the military in politics is measured on a scale from 0 to 6. The ratings of these twelve variables are then added together for a maximum (best) political risk rating of 100. The ICRG data covers 68 of the 78 countries (see Chart A). Also, political risk data is only available from 1984-2002, shortening the broader span of 1980-2004. Greater political risk is expected to hurt credit ratings through expected investment losses to corruption or political catastrophes.

**Estimating the Determinants of Sovereign Credit Ratings**

Since Institutional Investor credit ratings are based on the individual ratings of leading banks, there is no set formula for calculating a country’s credit rating based on its macroeconomic and institutional conditions. Employing the same method as Feder and Uy (1984), Cantor and Packer (1996), and Harms and Rauber (2005), I use regression analysis to determine the relative contributions of the variables described above to a sovereign credit rating.

I have two versions of my estimation equation, one regressing without the lagged transformed credit rating as a regressor and one regressing with it. These equations are:

\[
\text{IICT}_{it} = \sum_{j=1}^{8} \beta_j x_{j,it} + \alpha_i + \xi_t + \epsilon_{it} \tag{14}
\]

\[
\text{IICT}_{it} = \beta_1 \text{IICT}_{i(t-1)} + \sum_{j=2}^{9} \beta_j x_{j,it} + \alpha_i + \xi_t + \epsilon_{it} \tag{15}
\]

where \(\text{IICT}_{it}\) is the transformed sovereign credit rating of country \(i\) in year \(t\), \(x_{j,it}\) refers to each of the eight macroeconomic and institutional variables I regress over, \(\alpha_i\) captures unobserved country-specific effects and \(\xi_t\) captures unobserved time-specific effects that may otherwise bias the other variables’ coefficients. Finally, \(\epsilon_{it}\) is the error term.

In these estimation equations, the macroeconomic variables are lagged for two reasons. First, since half of the Institutional Investor credit rating in year \(t\) is from March and
macroeconomic variables reflect the entire year $t$, half of the credit rating would not be very representative of the variables without lagging the variables. Secondly, lagging the macroeconomic variables will reduce endogeneity bias, since it is very possible that credit ratings announced in March of year $t$ would cause a rated central government to alter policies so as to improve its September ratings, thereby affecting macroeconomic variables in year $t$.

Results (1): Determinants of Sovereign Credit Ratings

Our estimation results of equations (14) and (15) are shown in Columns A and B, respectively, of Table 2. In my estimation of equation (14), I regress sovereign credit ratings on all regressors except for the lagged dependent variable. I find that external debt stocks, GDP growth, inflation, the ratio of reserves to imports, trade and political risk are all very significant and of the expected sign. Current account balance over GDP, on the other hand, is highly significant and had a negative effect on credit ratings, while I expected a positive effect. This could be attributed to the role of capital flight and current account surpluses after economic shocks due to stabilization programs. Export growth is of the expected sign but, surprisingly, is insignificant. This regression’s $R^2$ is 0.554, so I look for some improvement in explanation.

Adding the lagged dependent variable as a regressor in equation (15) had a dramatic effect. External debt, GDP growth, reserves to imports, trade and political risk all remained highly significant and of the expected sign. Export growth remained insignificant but is now of the unexpected sign. This could be again due to requisite current account surpluses after economic shocks, correlating a growth in exports with credit rating downturns. Most prominently, lagged transformed credit ratings were highly significant. This supports Haque et al.’s (1997) claim that *Institutional Investor* credit ratings are highly persistent. Finally, inflation
and current account balances both became insignificant, likely because of the confounding effects discussed earlier.

Examining the data, I found that Nicaragua was a significant outlier. It ran extremely high inflation rates in the late 1980s and early 1990s (having the highest lagged inflation rates in the entire sample in 1989 and 1991). It also ran extremely high current account deficits in the early 1990s (five of the ten largest current account deficits in the sample are from Nicaragua in this time period). As a consequence I removed Nicaragua from the sample and repeated an estimation of equation (15). Column C of Table 2 shows the estimation results without Nicaragua (NIC) in the sample. External debt became more significant, but inflation and current account balances remained insignificant. These results agree with Feder and Uy’s (1984) study and Harms and Rauber’s (2005) study in finding that the debt to GDP ratio, reserves to imports ratio, export and GDP growth rates, and political risk were all significant. It is also consistent with Harms and Rauber’s (2005) finding that current account balances, export balances, and inflation are all insignificant after removing Nicaragua from the sample. All of the remaining regressions in this study exclude Nicaragua from the sample. Most importantly from this regression, I find external debt stock has a highly significant negative effect on sovereign credit ratings. This agrees with Sachs’ (1989) and Krugman’s (1989) theoretical models and with Patillo et al.’s (2004) empirical estimation of the costs of large debt stocks.

Estimating the Effect of Debt Forgiveness

If a high external debt stock does hurt the credit prospects of a developing country, as the previous analysis demonstrates, the next logical step is to see if forgiveness of the debt stock can
help the credit prospects. This study tests three potential mechanisms through which debt forgiveness affects credit ratings.

First, debt forgiveness may have an indirect effect on credit ratings through a lower debt stock. Second, debt forgiveness may directly affect credit ratings by sending a signal to investors regarding the solvency of the sovereign. This signal could be positive, indicating a country is in a better position than it once was and is supported by the international community, or negative, sacrificing a country’s financial reputation. Finally, debt forgiveness may change the borrowing behavior of the sovereign and lending behavior of creditors. If debt forgiveness comes at the expense of creditor governments instead of private banks, the forgiveness might encourage irresponsible borrowing and lending leading to debts that need to be bailed out. However, debt forgiveness might also lower the net benefit of a default and lower the disincentive to policy reform that a large debt stock creates. These three effects will determine how debt forgiveness affects future lending behavior.

If debt forgiveness can boost sovereign credit ratings, debt forgiveness would lead to less expensive capital accumulation from international markets for countries with scarce resources. If, however, debt forgiveness does not significantly affect credit ratings or even, perversely, lowers them, then proponents of debt forgiveness as a solution to debt overhang must reconsider their arguments.

Graph 2 shows, on a country-by-country basis from my sample, how credit ratings responded to debt forgiveness during the sampling period. In some countries credit ratings seem to not respond at all, while in others credit ratings rise immediately after a forgiveness act. However, several macroeconomic changes would be occurring simultaneously, and thus I use regression analysis to identify the particular impact of debt forgiveness.
Equation (16) estimates the direct effects of forgiveness by controlling for the reduced debt stock. It regresses transformed credit ratings in year \( t \) on its debt stock (\( DEBT \)) and its debt forgiven (\( FORGIVE \)) in year \( t-1 \) (both as fractions of GDP), along with the other control variables. This estimation is motivated by the fact that debt stocks in a given year are already written down by the amount of debt forgiveness issued that year. By controlling for \( DEBT \), the coefficient on debt forgiveness, \( \beta_3 \), will capture the credit rating effect of forgiveness outside of reducing the debt stock. As before, \( x_{j,it} \) represents each of the control variables in our study aside from the debt stock, which is already explicitly specified.

In equation (17), I estimate the total effect of forgiveness, both direct and indirect, on credit ratings by replacing the Debt/GDP ratio with the Debt/GDP ratio before debt forgiveness took place. The variable \( DEBT_{NoForgive,it} \) is the sum of the debt stock and debt forgiveness in year \( t \), divided by GDP. By considering the pre-forgiveness level of debt, the coefficient on \( FORGIVE \) (\( \beta_3 \)) now captures the entire effect of debt forgiveness on credit ratings. By comparing the effect of forgiveness outside of debt stock reduction in equation (16) and the total forgiveness effect in equation (17) I can hopefully see the isolated effect of debt stock reduction.

**Results (2): Estimating the Effect of Debt Forgiveness**

The results from my estimations of equation (16) and equation (17) are found in Table 3. Columns A and B show the estimation results of equations (16) and (17), respectively. I find that debt forgiveness has no significant effect on credit ratings, regardless of whether forgiveness is included in the debt stock or not. Interestingly, however, while debt forgiveness has a negative
effect on credit ratings when controlling for its role in reducing the debt stock (in Column A), when estimating the total effect of debt forgiveness on credit ratings (in Column B), debt forgiveness then has a positive effect on credit ratings. This would suggest that debt forgiveness outside of debt stock reduction hurts credit ratings, possibly due to altered borrowing or lending behavior, as a result of the forgiveness act; it also suggests that the debt stock reduction has a positive effect that dominates the adverse direct effect. However, since forgiveness remains highly insignificant, this implication is not compelling. All other regressors maintained the same coefficients and level of significance.

It thus appears that although a high debt stock hurts investor willingness to provide credit to developing countries, past debt forgiveness has not relieved the disincentives of high debt stock. This result agrees with Chauvin and Kraay’s (2005) finding that debt forgiveness had no significant effect in improving investment in developing countries. In the next section, I consider some of the explanations for the failure of debt forgiveness.

5. Possible Explanations

My finding that there is no compelling evidence that past debt forgiveness has had an effect on sovereign credit ratings can be attributed to a number of different possible reasons. Four of the most commonly cited are that 1) corruption has plagued the deployment of debt forgiveness; 2) debt forgiveness has been dwarfed by aid flows and thus has not changed debtor country behavior; 3) debt forgiveness has been matched by further borrowing; and 4) debt forgiveness thus far has in fact not been large enough. I will consider these reasons in turn.

Corruption is pointed to as a major impediment to the success of debt forgiveness programs. Under a corrupt government, the moral hazard of debt forgiveness is even more
problematic. Since money is fungible, without accountability, debt from legitimate and illegitimate expenditures can be forgiven. Even under the accountability programs of HIPC, corruption indicators measured by Kaufman, Kraay and Mastruzzi declined for HIPC countries from 1996 to 2004 (Lala 26-7).

However, corruption measures from the sample countries do not paint an indicting picture. Graph 3 describes the spread of the 78 sample countries across the 0 to 6 point ICRG corruption ratings, where a 6 indicates the least corruption. 60% of the observations of these 78 countries from 1980 to 2004 have a corruption rating higher than 3, and only a small fraction of the observations have a corruption rating less than 1. While corruption is not at ideal levels in these countries, it is not so poor as to convincingly explain why debt forgiveness has such little effect on credit ratings.

Another reason that debt forgiveness did not have a significant effect on credit ratings may be because countries are simultaneously receiving aid flows that are significantly greater than the forgiveness flows. Chauvin and Kraay (2005) address this in their analysis of why debt forgiveness did not have the positive development effect claimed by advocates. They find that the median present value of all debt relief between 1989 and 2003 was approximately 10 percent of GDP in 1988, whereas the present value of net aid receipts in the same period was 126 percent of GDP.

In Graph 4, I track debt forgiveness flows and official aid flows from 1989 to 2004. In the years 1990 and 2000, each a year with a different debt forgiveness policy push (the Brady Plan and the HIPC initiative), debt forgiveness flows approached that of aid flows. Outside of those two years, however, aid flows were significantly higher than debt forgiveness flows, usually more than three times as much and in 1996 more than sixteen times. As a consequence,
debt forgiveness plays a smaller role for debtor countries that rely more on aid flows. Changes in debt forgiveness will consequently alter debtor behavior less in light of this fact. It remains unlikely, though, that this could entirely account for debt forgiveness’s insignificance, given the significance external debt has in determining credit ratings.

A third reason that could explain the insignificant impact forgiveness has had on credit ratings is that if debtor countries are able to secure new borrowing regardless of their indebtedness, the provision of credit would not depend on debt levels and consequently debt forgiveness would not affect credit ratings. Easterly (2001) documents that World Bank loans to developing countries in the 1980s and 1990s increased “in lock step with mounting debt service.” In fact, HIPC countries borrowed enough new funds during the 1980s and 1990s to offset the past debt forgiveness: from 1989 to 1997, debt forgiveness to 41 HIPC countries reached $33 billion, while their new borrowing in that same time frame was $41 billion (Easterly [2001] 21-22). Indeed, the World Bank Group’s Independent Evaluation Group (IEG) found in a 2006 evaluation of the HIPC initiative that while “countries’ improved exports and revenue mobilization have helped to lower debt indicators…this has been offset by increases in debt due to new borrowing” (Lala 33).

The results from my sample are slightly more mixed, as should be expected from a broader sampling of developing countries in place of a sample of all heavily-indebted poor countries. Graph 5a tracks debt forgiveness and disbursements of new debt to sample countries from 1989 to 2004. New debt has indeed greatly exceeded forgiveness flows, providing support to Easterly’s argument. However, Graph 5b shows new borrowing over time in relation to sovereign credit ratings, and there is a clear trend that credit has been increasingly forthcoming
as credit ratings improve. Since credit ratings are significantly determined by debt (see graph 6), it is too much to argue that credit is provided regardless of debt levels.

It is quite evident from our regressions decomposing the components of credit ratings that high debt stocks play a significant role in lowering credit ratings. In Graph 6, I track the average debt stocks/GDP ratios and the average credit ratings of my sample countries over time. There is a clear relationship: as debt ratios skyrocketed during the 1980s, credit ratings plunged, and as the ratios stabilized and reversed course, credit ratings increased in step.

A final possible reason that forgiveness of this debt has not had a significant effect is that the level of debt forgiveness has not been large enough to reduce debt stock levels to levels at which countries reach solvency. Returning to Sachs’ model presented in Section 3, only if the existing debt is forgiven beyond a threshold level will new creditors begin lending. Indeed, while Chauvin and Kraay (2005) point out that developing countries have received $100 billion in debt forgiveness from 1989 to 2003, the external debt stock of the developing countries in my sample totaled $2.4 trillion in 2003. The problematic catch-22 policy implication of this is that we can never see in practice if debt forgiveness will work unless it is deployed in a large enough amount.

Yet in my sample, debt forgiveness markedly reduced debt stocks to an extent that it is surprising that credit ratings did not register the change. In Graph 7, I show the average debt stock as a fraction of GDP after debt forgiveness and in the scenario where no forgiveness was given at all. Especially in the last five years of the sampling period, the two Debt/GDP ratios diverged markedly, by approximately 12 percentage points. Breaking this down by country, it is evident that a few outlier countries, (Angola, Republic of Congo, Mozambique, Nicaragua), exaggerated this effect, (see Graph 8a). After removing these outlier countries (see Graph 8b),
however, debt ratios without past forgiveness remained significantly higher than debt ratios including past forgiveness in a number of countries.

Of these four confounding effects, it thus seems that dominating aid flows and offsetting debt disbursements plausibly contribute to debt forgiveness having a marginal effect on credit ratings. However, my sample countries are not particularly corrupt, and past forgiveness has been significant enough to lead to markedly lower Debt/GDP ratios. The interaction of debt forgiveness and these confounding effects should be the focus of significant further study.

6. Conclusions

This study explored the impact of debt forgiveness on sovereign credit ratings. Past work had shown theoretically and empirically that high debt stocks generate several disincentives that dry up capital flows to indebted countries, so called “debt overhang” problems. It was conjectured and modeled by Sachs (1989) that debt forgiveness, which has now increasingly become a mainstream tool of development policy, could ease these disincentives by reducing debt stocks to levels at which creditors are comfortable lending. I also proposed that debt forgiveness could have an impact on credit ratings outside of the debt stock reduction effect. In particular, debt forgiveness might act as a signal to creditors about the solvency of a country, or it might alter the borrowing behavior of the debtor country as a result of moral hazard issues. This study thus sought to determine the extent and nature of any effect debt forgiveness might have on credit ratings.

To that end, I first had to understand the composition of credit ratings and the relative significance of different macroeconomic and institutional variables. Using regression analysis, I tried to explain Institutional Investor sovereign credit ratings using a variety of indicators from a
sample of 78 developing countries from 1980 to 2004. I found in particular that *Institutional Investor*’s credit ratings are highly persistent and that large external debt stocks have a highly significant negative effect on credit ratings. This finding suggests that debt forgiveness could play a significant role in boosting credit ratings.

However, I found no such significance. Using debt finance data from the World Bank’s *Global Development Finance* database, I estimated both the overall effect of debt forgiveness and the effect of debt forgiveness outside a debt reduction effect. I found that the overall effect of debt forgiveness was positive, while the effect outside of debt stock reduction was negative, possibly due to adverse signals to creditors or irresponsible consequent borrowing behavior. However, both of these estimated coefficients were highly insignificant and thus I found no compelling evidence of a significant role for debt forgiveness in boosting credit ratings. This finding was consistent with Chauvin and Kraay’s (2005) finding that debt forgiveness had no impact on growth, investment, or public spending. My study’s principal limitation concerns the debt forgiveness data available. The World Bank’s *Global Development Finance* database provides the most comprehensive source of debt forgiveness data, but unfortunately does not provide present-value valuations of debt forgiveness. Concessionality is thus not incorporated into the debt forgiveness in my dataset, and this should be kept in mind when interpreting the results.

Finally, I considered four arguments frequently voiced to explain the inefficacy of debt forgiveness. The first argues that corruption in developing countries undermines the impact of debt forgiveness, since both legitimate and illegitimate debt is forgiven. However, examining the ICRG corruption ratings of the countries in my sample, corruption was not a significant problem.
The second argument concerned the fact that aid flows dwarf debt forgiveness flows, and thus changes in debt forgiveness would have little effect on a debtor country’s behavior and thus not change its credit rating. Comparing the aid and debt forgiveness flows to the sample countries, I found that debt forgiveness was significantly lower than other aid over the whole sampling period.

The third argument concerned the fact that reborrowing by developing countries was outpacing its forgiveness, rendering the impact of forgiveness negligible. If indebted countries could always secure new borrowing, there would not be a solvency or liquidity crisis for debt forgiveness to aid. Tracking debt disbursements and debt forgiveness in my sample over time showed that reborrowing did dwarf and outpace forgiveness, although it also illustrated that the rapid increase in debt disbursement was linked to the rapid improvement in credit ratings, suggesting that although indebted countries have been able to secure new loans, creditworthiness remained an important factor.

Finally, I considered the argument that debt forgiveness thus far has not been enough to significantly help the creditworthiness of indebted countries. To assess this argument, I compared sample countries’ debt paths with their debt path had they not received forgiveness. I found that the paths diverged markedly and that the debt stock of developing countries had been significantly lowered by debt forgiveness. Given the importance of external debt stock to credit ratings, this last argument does not seem a likely explanation.

Disproportionate aid flows and extensive reborrowing by debtor countries seem to offer a partial explanation of why debt forgiveness has had an insignificant effect on credit ratings. All four arguments should be further examined, though, in light of this fact that despite its prominent
role in most development policies and the popular sentiments it has aroused, debt forgiveness has not been effective at improving the creditworthiness of its targets.
### Chart A: Full Sample of Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Country</th>
<th>Country</th>
<th>Country</th>
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<tbody>
<tr>
<td>Algeria</td>
<td>Egypt</td>
<td>Mali</td>
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<td>Angola</td>
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<td>Syria</td>
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<td>Gabon</td>
<td>Mozambique</td>
<td>Tanzania</td>
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<td>Bolivia</td>
<td>(Georgia)</td>
<td>(Nepal)</td>
<td>Thailand</td>
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<td>Botswana</td>
<td>Ghana</td>
<td>Nicaragua *</td>
<td>Togo</td>
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<td>Brazil</td>
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<td>Nigeria</td>
<td>Trinidad &amp; Tobago</td>
</tr>
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<td></td>
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<td>Sierra Leone</td>
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**Notes:**
- Countries in parentheses do not have GOV data (ICRG)
- * Nicaragua is excluded from most regressions
Chart B: Data Definitions and Sources –

**Institutional Investor Credit Ratings (IICR)** – Sovereign credit ratings published every March and September by *Institutional Investor* magazine since 1979.
Source: Biannual issues of *Institutional Investor* magazine

**Current Account Balance (CA)** – Ratio of the current account balance to GDP
Source: *World Development Indicators*

**External Debt (DEBT)** – Ratio of the total external debt stock to GDP. Total external debt stock is defined as “public and publicly guaranteed long-term debt, private non-guaranteed long-term debt, the use of IMF credit, and short term debt” (GDF)
Source: *Global Development Finance 2006*

**Export Growth (EXPGROWTH)** - % change in exports of goods and services
Source: *World Development Indicators 2006*

**GDP Growth (GROWTH)** – Annual % change in gross domestic product
Source: *World Development Indicators 2006*

**Reserves (RESERVES)** – Ratio of international reserves to imports of goods and services
Source: *World Development Indicators 2006*

**Trade (TRADE)** – The sum of exports and imports of goods and services divided by GDP
Source: *World Development Indicators 2006*

**Inflation (INFLATION)** – Annual percentage change in consumer prices
Source: *World Development Indicators 2006*

**Political Risk (GOV)** – The “Political Risk” score as measured by the *International Country Risk Guide (ICRG)*. This is the sum of the scores in the twelve different political risk categories.
Source: Political Risk Services

**Debt Forgiveness (FORGIVE)** – Debt forgiveness is the sum of the *Global Development Finance* categories “debt forgiveness or reduction”, which measures the nominal amount of principal forgiven (including principal and interest arrears forgiven), and “interest forgiven”, which measures the nominal amount of interest forgiven.
Source: *Global Development Finance 2006*
### Table 1a - Summary Statistics
(Summary and Definitions on Table 4)

<table>
<thead>
<tr>
<th></th>
<th>Obsv.</th>
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<th>Std. Dev</th>
<th>Min.</th>
<th>Max.</th>
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<tr>
<td>IICR</td>
<td>1733</td>
<td>30.012</td>
<td>15.252</td>
<td>4.000</td>
<td>73.300</td>
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<tr>
<td>CA</td>
<td>1731</td>
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<td>6.888</td>
<td>-44.899</td>
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<td>DEBT</td>
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<td>0.634</td>
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<td>GROWTH</td>
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<td>3.077</td>
<td>5.384</td>
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<tr>
<td>INFLATION</td>
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<td>533.577</td>
<td>-11.686</td>
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<tr>
<td>RESERVES</td>
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<td>0.356</td>
<td>0.344</td>
<td>0.003</td>
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<td>0.013</td>
<td>0.062</td>
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<td>1.208</td>
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### Table 1b - Summary Statistics (only countries with GOV data, without Nicaragua)

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<td>INFLATION</td>
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### Table 3: Effect of Debt Forgiveness on Credit Ratings

Regression equations (16) and (17) - Dependent Variable: IICT

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</table>

Observations 814
Countries 67
R<sup>2</sup> 0.976
Average Credit Ratings and Net Private Resource Flows Over Time

Graph 1

Net Private Resource Flows (billions $)

YEAR...

IICR

Net Private Resource Flows (billions $)
Graphs by country_name
Graph 3
Average Debt Forgiveness and Aid Flows Over Time
Corruption in Sample Countries

Graph 4

ICRG Corruption Ranking (out of 6)
Graph 5a
Debt Forgiveness and New Borrowing Over Time

US$ (Billions)


Average Debt Forgiveness (billions)  Average Disbursements (Billions)
Average Credit Ratings and Debt Disbursements over Time

Graph 5b

Year

Average IICR

Average Debt Disbursement

US$ (billions)
Graph 7

Average Debt/GDP vs. Debt/GDP without Forgiveness

Year

DEBT/GDP without Forgiveness

DEBT/GDP
Graph 8a

Graphs by country_name
Graph 8b

Debt/GDP

Debt/GDP (without forgiveness)

Graphs by country_name

year
References:


• Creditor Reporting System, Online, OECD Development Assistance Committee, 2002


• Thomas, M.A. (2001) “Getting Debt Relief Right”, *Foreign Affairs*, 80 (5), September / October


• World Bank (2006) *World Development Indicators 2006*