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## **Debt intolerance**

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*This paper introduces the concept of “debt intolerance,” which manifests itself in the extreme duress many emerging markets experience at debt levels that would seem manageable by advanced country standards. We argue that “safe” external debt-to-GNP thresholds for debt intolerant countries are low, perhaps as low as 15 percent in some cases. These thresholds depend on a country’s default and inflation history. Debt intolerance is linked to the phenomenon of serial default that has plagued many countries over the past two centuries. Understanding and measuring debt intolerance is fundamental to assess the problems of debt sustainability, debt restructuring, capital market integration, and the scope for international lending to ameliorate crises. Our goal is to make a first pass at quantifying debt intolerance, including delineating debtors’ clubs and regions of vulnerability, on the basis on a history of credit events going back to the 1820s for over 100 countries.*

*JEL: F30, F32, F34*

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## I. INTRODUCTION

In this paper, we argue that history matters by introducing the concept of “debt intolerance,” which manifests itself in the extreme duress many emerging markets experience at debt levels that would seem quite manageable by advanced country standards. “Safe” debt thresholds for highly debt intolerant emerging markets turn out to be surprisingly low, perhaps as low as fifteen to twenty percent in many cases, and these thresholds depend heavily on a country’s record of default and inflation. Debt intolerance, in turn, is intimately linked to the pervasive phenomenon of serial default that has plagued so many countries over the past two centuries. Debt intolerant countries tend to have weak fiscal structures and financial systems. These problems are often exacerbated by default, thereby making these same countries more prone to future defaults. Understanding and measuring debt intolerance is fundamental to assess the problems of debt sustainability, debt restructuring, capital market integration, and the scope for international lending to ameliorate crises.

Certainly, the idea that factors such as institutions and histories affect the interest rates at which a country can borrow has been well-developed in the theoretical literature, as is the notion that as external debt rises, a country becomes more vulnerable to being suddenly shut out from international capital markets, i.e., a debt crisis.<sup>1</sup> However, there has been no attempt to make these abstract theories operational by identifying the factors (particularly a history of serial default or restructurings) that govern how quickly a country becomes vulnerable to a debt crisis as its external obligations accumulate. Our goal here is to quantify debt intolerance, based on a history of credit events going back to

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<sup>1</sup> See Obstfeld and Rogoff (1996), chapter 6.

the 1820s. We argue that a country's current level of "debt intolerance" can be calibrated empirically by the ratio of the long-term average of its external debt (scaled by GNP or exports) to an index of default risk. We recognize that other factors, such as the degree of dollarization, indexation and maturity structure, are also relevant to assessing a country's vulnerability to experiencing symptoms of debt intolerance.<sup>2</sup> We argue, however, that these factors are generally manifestations of the same underlying institutional weaknesses. Indeed, absent addressing these weaknesses, the notion that the "original sin" of the serial defaulters can be extinguished through any stroke of financial engineering, thereby allowing these countries to borrow advanced economies quantities at advanced-country rates, is sheer folly.<sup>3</sup>

A few of our results bear emphasis:

In section II of the paper, we give a brief overview of the history of serial default on external debt, and find that it is a remarkably pervasive phenomenon, with European countries setting benchmarks that today's emerging markets have yet to surpass (Spain defaulted 13 times between 1500 and 1900; Venezuela, the post-1800 record holder in our sample, has defaulted on external debt "only" nine times.) We go on to show how countries can be divided into debtors' clubs and debt intolerance regions depending on their credit and high inflation history, and develop first broad-brush measures of safe debt thresholds. The data overwhelmingly suggest that debt thresholds for emerging

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<sup>2</sup> See Goldstein (2003) for a comprehensive discussion of these vulnerabilities.

<sup>3</sup> Some analysts, for example Eichengreen, Hausmann and Panizza (2002), have put the blame for the recurring debt cycles on the incompleteness of international capital markets, and have proposed mechanisms to make it easier for emerging market countries to borrow more. Needless to say, our view here is that the main problem for these countries is how to borrow less. For another critical discussion of the notion of original sin, on different grounds, see Reinhart and Reinhart (2003).

economies with high debt intolerance are much lower than those for the advanced economies or for the emerging markets that have never defaulted on their external debt obligations. Indeed, 50 percent of default or restructurings since 1970 took place with external debt-to-GNP levels below 60 percent.<sup>4</sup>

Our key finding in Section III of the paper is that a country's external debt intolerance can be explained by a very small number of variables about its repayment history, debt levels, and its history of macroeconomic stability. Countries with high debt intolerance are viewed by markets as having an elevated risk of default, even at relatively low debt-to-output ratios. Whether markets adequately price this risk is an open question, but it is certainly a risk that citizens of debt intolerant countries should be aware of when their leaders engage in heavy borrowing.

Section IV turns to the question of how debt intolerance affects conventional debt sustainability calculations, which are typically based on the assumption of continual market access. Yet, for debt intolerant countries, maintaining sustained access to capital markets can be problematic unless debt ratios are quickly brought down to safer ground. To assess how "deleveraging" might be accomplished, we proceed to examine how, historically, emerging market countries with substantial external debts have managed to work them down. To our knowledge, this is a phenomenon that has previously received very little, if any attention. We analyze episodes of large debt reversals, where external

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<sup>4</sup> For a model that implies that an economy with low levels of taxation and debt may optimally repudiate its debt, or inflate at high rates more frequently than an economy that has inherited high levels of taxation and debt (i.e., such as the advanced economies), see Sims (2001). Indeed, consistent with some of the predictions of that model, as we shall see, the countries with the highest historical default probabilities and highest probability of inflation rates above 40 percent per annum, also had (on average) much lower levels of debt than the advanced economies.

debt fell by more than 25 percentage points of GNP over a three-year period. Of the 22 reversals we identify for middle income countries since 1970, almost 2/3 involved some form of default or restructuring. Only in one case (Swaziland, 1985), was a country able to largely grow its way out of a high external debt/GDP ratio.

Because history plays such a large role in our analysis, we focus primarily on understanding emerging market countries' access to external capital markets. For most emerging markets, external borrowing has been the only game in town for much of the past two centuries, and our debt thresholds are calculated accordingly. Over the past decade or so, however, a number of emerging market countries have, for the first time, seen a rapid expansion in domestic market-based debt, as we document using an extensive new data set presented in Section V. How might these relatively new debt burdens affect the thresholds presented in Section III? Although we do not have enough historical data to answer this question fully, and the calculus of domestic default and external debt default, though linked, obviously differs, we argue that intolerance to domestic government debt is rapidly becoming the critical issue in understanding risks in emerging markets.<sup>5</sup>

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<sup>5</sup> Some policymakers, of course, have recognized the problem at least since the Mexican debt crisis of 1994. The academic literature has lagged behind due, in part, to lack of data, but also the theoretical connections between external and domestic debt have not been well articulated. Nonetheless, among the participants in this debate, Ron McKinnon should receive special mention for anticipating the emergence of domestic government debt as a problem to be reckoned with. In 1991 he wrote: "One of the most striking developments of the late 1980s was the extent to which the governments of Mexico, Argentina and Brazil went into debt *domestically*. Because of the cumulative effect of very high interest rates Brazil (over 30 percent real was not unusual) on their existing domestic liabilities, government-debt-to-GNP ratios have been building up in an unsustainable fashion even though most of these countries are not paying much on their debts to international banks. In many LDCs, people now anticipate that governments will

Lastly, if serial default is such a pervasive phenomenon, why do markets repeatedly lend to debt intolerant countries to the point where the risk of a credit event becomes significant? Part of the reason may have to do with the procyclical nature of capital markets, which lend to emerging market countries vast sums in boom periods (possibly expecting that the boom will last indefinitely) and retrench when there are adverse shocks, producing painful sudden stops.<sup>6</sup> As for the complicity of countries in the problem, one can only conclude that throughout history many governments have been too short-sighted (or too corrupt) to internalize the significant risks of overborrowing. Moreover, in the modern era, multilateral institutions were too complacent (or had too little leverage) when things were seemingly going well. Thus, a central conclusion of this paper is that for debt intolerant countries, it would likely be desirable to find mechanisms to limit external borrowing either through institutional change on the debtor side, or through changes in the creditor-country legal or regulatory system.<sup>7</sup>

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default on its own domestic bonds--as in March 1990 with the Brazilian government's freeze of its own outstanding liabilities" (*The Order of Economic Liberalization*, page 6).

<sup>6</sup> The procyclicality of capital flows to developing countries has been amply documented in the literature, particularly since Carlos Díaz-Alejandro called attention to the phenomenon on the eve of the Latin American debt crisis of the 1980s (Díaz-Alejandro 1983, 1984). For a recent and systematic review of the evidence on the procyclicality of capital flows, see Kaminsky, Reinhart, and Végh (2003).

<sup>7</sup> The need for making institutional and legal changes to help to rechannel flows to developing countries from debt towards FDI, equity (and aid)--to reduce recurrent debt crises--is the central theme of Bulow and Rogoff (1990).

## II. DEBT INTOLERANCE: ORIGINS AND IMPLICATIONS FOR BORROWING

In this section, we sketch the history of debt intolerance and serial default, and show how this history importantly influences what “debtors club” (and “region” or sub-type) a country belongs to.

### *Debt intolerance and serial default in historical perspective*

Our aim is not so ambitious as to provide the world history of debt and default, but a bit of context helps to explain our approach, which draws on a country’s long-term debt history. The basic point is that many countries that have defaulted on their external debts, have done so repeatedly, with remarkable similarities across the cycles. For example, and we will shortly present evidence, many of the Latin American countries that have been experiencing severe debt problems today also experienced debt problems in the 1980s. And in the 1930s. And in the 1870s. And in the 1820s. And generally, other times a well. Turkey, a country that has been on and off again at the center of attention of late, has defaulted six times over the past 175 years. Brazil, whose debt has also attracted attention, has defaulted seven times on external debt. Venezuela has defaulted nine times, and Argentina four times, not counting its most recent episode. These same countries have at times also defaulted, *de facto*, on internal obligations, through high inflation or hyperinflation. On the other side of the ledger, a number of countries have strikingly averted outright default or present-value reducing restructuring, including India, Korea, Malaysia, Singapore, and Thailand.

Indeed, the contrast between the histories of the non-defaulters and the serial defaulters, illustrated in Table 1, is stunning. Default can become a way of life. Over the 175-year period from 1824-2001, Brazil and Argentina’s debts were either in default, or undergoing restructuring, a quarter of the time, Venezuela and Colombia almost forty



**Table 1. Inflation, External Debt Defaults and Country Risk: 1824-2001**

	<i>Percent of 12-month periods with inflation at or above 40 percent, 1958:1-2001:12<sup>a</sup></i>	<i>Number of default or restructuring episodes</i>	<i>Percent of years in a state of default or restructuring</i>	<i>Number of years since last year in default or restructuring status</i>	<i>Institutional Investor Ratings, September 2002</i>
<i>Emerging market countries with at least one external default or restructuring since 1824</i>					
Argentina	47.2	4	26.1	0	15.8
Brazil	59.5	7	25.6	7	39.9
Chile	18.6	3	23.3	17	66.1
Colombia	0.8	7	38.6	57	38.7
Egypt	0.0	2	12.5	17	45.5
Mexico	16.7	8	46.9	12	59.0
Philippines	11.0	1	18.5	10	44.9
Turkey	57.8	6	16.5	20	33.8
Venezuela	11.6	9	38.6	4	30.6
<i>Group average</i>	<i>24.8</i>	<i>5.2</i>	<i>27.4</i>	<i>16</i>	<i>41.6</i>
<i>Emerging market countries with no external default history</i>					
India	0.0	0	0.0	...	47.3
Korea	0.0	0	0.0	...	65.6
Malaysia	0.0	0	0.0	...	57.7
Singapore	0.0	0	0.0	...	86.1
Thailand	0.0	0	0.0	...	51.9
<i>Group average</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>...</i>	<i>61.7</i>
<i>Advanced economies with no external default history</i>					
Australia	0.0	0	0.0	...	84.5
Canada	0.0	0	0.0	...	89.4
New Zealand	0.0	0	0.0	...	81.2
Norway	0.0	0	0.0	...	93.1
United Kingdom	0.0	0	0.0	...	94.1
United States	0.0	0	0.0	...	93.1
<i>Group average</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>....</i>	<i>89.2</i>

<sup>a</sup> The sample is smaller for some of the countries and begins in: 1962:1 for Singapore; 1964:1 for Brazil; 1966:1 for Thailand; 1970:1 for Turkey; and 1971:1 for Korea.

Notes: ... denotes not applicable.

Sources: Based on authors' calculations. Dates for the default or restructuring episodes are taken from Beim and Calomiris (2001) and Standard and Poor's *Credit Week* and *Debt Cycles in the World Economy* (1992); the ratings are from *Institutional Investor*, inflation is calculated from consumer price indices as reported in *International Monetary Fund*, International Financial Statistics.

percent of the time, and Mexico almost half of all years since independence. On average, the serial defaulters had inflation over 40 percent roughly a quarter of the time as well.<sup>8</sup>

<sup>8</sup> Our list of serial defaulters in Table 1 is far from complete. When Russia defaulted in 1998, it was hardly the first time (see Table 2, for example, not to mention Tsarist debt

By contrast, the countries in the table with no external default history (India, Korea, Malaysia, Singapore, and Thailand) did not have a single twelve-month period with over 40 percent inflation among them. For future reference, the table also includes a group of advanced countries with no modern history of external default.

Today's emerging markets did not invent serial default, it has been practiced in Europe at least since the 16th century, as Table 2 illustrates. Spain defaulted on its debts 13 times from the 16<sup>th</sup> through the 19<sup>th</sup> centuries, with the first recorded default in 1557 and the last in 1882. In the nineteenth century alone, Portugal and Germany defaulted on external debt six times, while Greece and Austria were not far behind with four and five defaults respectively. France defaulted on its debts eight times between 1500 and 1788. (Admittedly, the French governments' debts were mainly held internally before 1700, and to achieve "debt restructuring", the monarchs often simply beheaded the creditors.<sup>9</sup>)

This central fact that some countries seem to default periodically, while others do not default at all, both grips us to write on this topic and organizes our thinking. True, as we shall later illustrate, history is not everything. Countries can eventually outgrow debt intolerance, but the process tends to be extremely slow, and it is extremely difficult to avoid backsliding.

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after the communist revolution in 1917.) And many other countries have defaulted on external debts, including recently, Indonesia and the Ukraine in 1998; Pakistan in 1999, and Ecuador in 2000,

<sup>9</sup> "Bloodshed" (saignee) of financiers took place near the time of several of France's defaults, including 1563, 1635 and 1661, with particularly prominent creditors of the government being executed; see Boshier (1970) and Bouchard (1891). The authors are grateful to Harold James for these references.

**Table 2. An Early History of External Debt Defaults: Europe from the 16th to the 19th Century**

	1501-1800		1801-1900 <sup>a</sup>		Total defaults
	number of defaults	years of default	number of defaults	years of default	
Spain	6	1557, 1575, 1596 1607, 1627, 1647	7	1820, 1831, 1834, 1851 1867, 1872, 1882	13
France	8	1558, 1624, 1648, 1661 1701, 1715, 1770, 1788	n.a.		8 <sup>b</sup>
Portugal	1	1560	5	1837, 1841, 1845 1852, 1890	6
Germany	1	1683	5	1807, 1812, 1813 1814, 1850	6
Austria	n.a.	n.a.	5	1802, 1805 1811 1816, 1868	5
Greece	n.a.	n.a.	4	1826, 1843, 1860, 1893	4
Bulgaria	n.a.	n.a.	2	1886, 1891	2
Holland	n.a.	n.a.	1	1814	1
Russia	n.a.	n.a.	1	1839	1
<i>Total</i>	8		33		49

<sup>a</sup> "The age of financial pathology" (Winkler op.cit, page 35).

<sup>b</sup> Total for the period 1501-1800 only.

Notes: An n.a. denotes not available.

Sources: Max Winkler (1933), "Foreign Bonds: An Autopsy," Philadelphia: Roland Swain Company, William Wynne (1951) "State Insolvency and Foreign Bondholders, Vol. II" New Haven: Yale University Press, and Jaime Vives (1969), "An Economic History of Spain," Princeton, NJ: Princeton University Press.

### ***Is serial default really a problem?***

Given that we are warning of the dangers of debt intolerance, one might rightly ask whether history tells us that defaults are costly. Might periodic debt default simply be a mechanism for making debt more "equity-like," that is for effectively indexing a country's debt repayments to its output performance? After all, default and restructurings typically occur during economic downturns. (Bulow and Rogoff (1989) argue that formal output indexation clauses, while preferable, might be difficult to verify or enforce.) While there must be some truth to this argument, our reading of history is that the deadweight costs to

external debt default can be significant, particularly for a country's trade, investment and growth. In more advanced economies, external default can often cause lasting damage to a country's financial system, not least due to linkages between domestic and foreign markets. Indeed, although we do not investigate the issue here, we conjecture that one of the reasons why countries without a default history go to great lengths to avoid defaulting is precisely to protect their banking and financial systems. Conversely, weak financial intermediation structures in many serial defaulting countries lower their penalty to default. Lower costs of financial disruption induces these countries to default at lower thresholds, thereby further weakening the financial system, and perpetuating the cycle. One might make the same comment of tax systems, which we shall discuss at the end of this paper. Countries where capital flight and tax avoidance are high have greater difficulty meeting debt payments, thereby forcing governments to seek more revenues from relatively inelastic tax sources, and exacerbating flight and avoidance. Debt default amplifies and ingrains this cycle. Again, first-time defaulters are likely to face a much bigger initial loss, so non-defaulters are typically willing to take great pains to avoid slipping into this cycle.

We certainly do not want to overstate the costs to default and restructuring (especially for serial defaulters) since, in fact, we will later show that debt intolerant countries rarely choose to grow or pay their way out of high debt burdens without partial default. The revealed preference of debt intolerant countries has to be informative. Indeed, many question whether, in the long run, the costs of international bailouts necessarily exceed the costs of bringing forward default, at least for some spectacular historical cases. But there is another side to the question of whether debt intolerant countries really do borrow too much, and that has to do with the benefit side of the equation. Our read of the

evidence, at least from the 1980s and 1990s, is that external borrowing was often driven by short-sighted governments that were willing to take significant risks to raise consumption temporarily, rather than to foster high-return projects. The fact that gains to borrowing come quickly, but the higher risk of default is only borne in the future, tilts short-sighted governments towards excessive debt. So, while the costs of default are indeed often overstated, the benefits to be reaped from external borrowing are often overstated by even more, especially if one looks at the longer-term welfare of debtor-country citizens.

What does history tell about the lenders? We do not need to tackle this question here. Each of the periodic debt cycles the world has witnessed has had its own unique character, either in the nature of the lender (for example, bonds in the 1930s and 1990s versus banks in the 1970s and 1980s), or the nature of the domestic borrower (e.g., state-owned railroads in the 1870s versus government borrowing in the 1980s). Our main concern in this paper is to document debt intolerance and to show how highly debt intolerant countries start to experience symptoms at relatively low debt levels.

We now turn to quantitative analysis.

### ***Debt thresholds***

Few macroeconomists would be surprised to learn that emerging market countries with external debt-GNP ratios above 150 percent run a significant risk of default, given that among advanced countries, Japan's 120 percent of GDP debt is considered high. Yet, default can and does occur at levels of external debt-to-GNP that are not "excessive" from the vantage point of advanced nations, as some well-known cases of external debt default illustrate (e.g., Mexico 1982, with debt-to-GNP at 47 percent, and Argentina 2001, with debt-to-GNP slightly above 50 percent).

**Table 3. External Debt at the Time of Default: Middle Income Countries: 1970-2001**

	<i>Year of default or restructuring</i>	<i>External debt-to-GNP at year of default or restructuring</i>	<i>External debt-to-exports at year of default or restructuring</i>
Albania	1990	16.6	98.6
Argentina	1982	55.1	447.3
	2001 <sup>a</sup>	50.8	368.1
Bolivia	1980	92.5	246.4
Brazil	1983	50.1	393.6
Bulgaria	1990	57.1	154.0
Chile	1972	31.1	n.a.
	1983	96.4	358.6
Costa Rica	1981	136.9	267.0
Dominican Republic	1982	31.8	183.4
Ecuador	1984	68.2	271.5
	2000	106.1	181.5
Egypt	1984	112.0	304.6
Guyana	1982	214.3	337.7
Honduras	1981	61.5	182.8
Iran	1992	41.8	77.7
Iraq	1990	n.a.	n.a.
Jamaica	1978	48.5	103.9
Jordan	1989	179.5	234.2
Mexico	1982	46.7	279.3
Morocco	1983	87.0	305.6
Panama	1983	88.1	162.0
Peru	1978	80.9	388.5
	1984	62.0	288.9
Philippines	1983	70.6	278.1
Poland	1981	n.a.	108.1
Romania	1982	n.a.	73.1
Russian Federation	1991	12.5	n.a.
	1998	58.5	109.8
South Africa	1985	n.a.	n.a.
Trinidad and Tobago	1989	49.4	103.6
Turkey	1978	21.0	374.2
Uruguay	1983	63.7	204.0
Venezuela	1982	41.4	159.8
Yugoslavia	1983	n.a.	n.a.
<i>Average</i>		<i>71.1</i>	<i>234.9</i>

<sup>a</sup> As of 2000.

Notes: Income groups are defined according to the World Bank, *Global Development Finance*.

An n.a. indicates not available.

Debt stocks are reported at end-of-period. Hence, taking the debt-GNP ratio at the end of the default year biases ratios *upwards*, since in most cases defaults are accompanied by a sizable real exchange rate depreciation.

Sources: Debt and GNP come from the World Bank, *Global Development Finance*, dates of the default or restructurings are taken from Beim and Calomiris (2001), Standard and Poor's *Credit Week* and *Debt Cycles in the World Economy* (1992).

Our investigation of the debt thresholds of emerging market countries begins by chronicling all episodes of default or restructuring of external debt during 1970-2001 for middle income emerging economies.<sup>10</sup> Table 3 lists the country, the first year of the default or restructuring episode, and external debt-to-GNP and external debt-to-exports at the end of the year of the credit event.<sup>11</sup> Obviously, the aforementioned defaults of Mexico in 1982 and Argentina in 2001 were not exceptions. Table 4, which is derived from Table 3, shows that external debt exceeded 100 percent of GNP in only 17 percent of the defaults or restructuring episodes; that one half of all defaults occurred at levels below 60 percent; and that defaults took place against debt levels that were below 40 percent of GNP also in 17 percent of the cases.<sup>12</sup> (Indeed, the external debt-to-GNP thresholds reported in Table 3 are biased *upwards* because the debt-to-GNP ratios corresponding to the year of the credit event are driven up by the real exchange rate depreciation that typically accompanies the event.)

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<sup>10</sup> Following the World Bank, for some purposes, we divide developing countries according to their level of per capita income in two broad groups: middle income countries (those with a GNP per capita in 1999 higher than US\$755) and low income countries. Most (but not all) emerging market economies with substantial access to private external financing are middle income countries. Similarly, most (though not all) of the low income countries do not have access to private capital markets and rely primarily on official sources of external funding.

<sup>11</sup> Note that many of these default episodes lasted several years.

<sup>12</sup> Note that tables 3 and 4 measure *gross* total external debt as debtor governments have little capacity to tax or otherwise confiscate private citizens' assets held abroad. When Argentina defaulted in 2001 on US\$ 140 billion of external debt, for example, its citizens held foreign assets abroad estimated by some commentators at about US\$ 120-150 billion. This phenomenon is not uncommon, and was the norm in the 1980s debt crises.

**Table 4. External Debt at the Time of Default: Frequency Distribution, 1970-2001**

<i>External debt-to-GNP range at the first year of default or restructuring</i>	<i>Percent of total defaults or restructurings in middle income countries</i>
Below 40 percent	17
41 to 60 percent	30
61 to 80 percent	23
81 to 100 percent	13
Above 100 percent	17

Notes: Income groups are defined according to the World Bank, *Global Development Finance*.

These shares are based on the cases for which we have data for debt-to-GDP ratios.

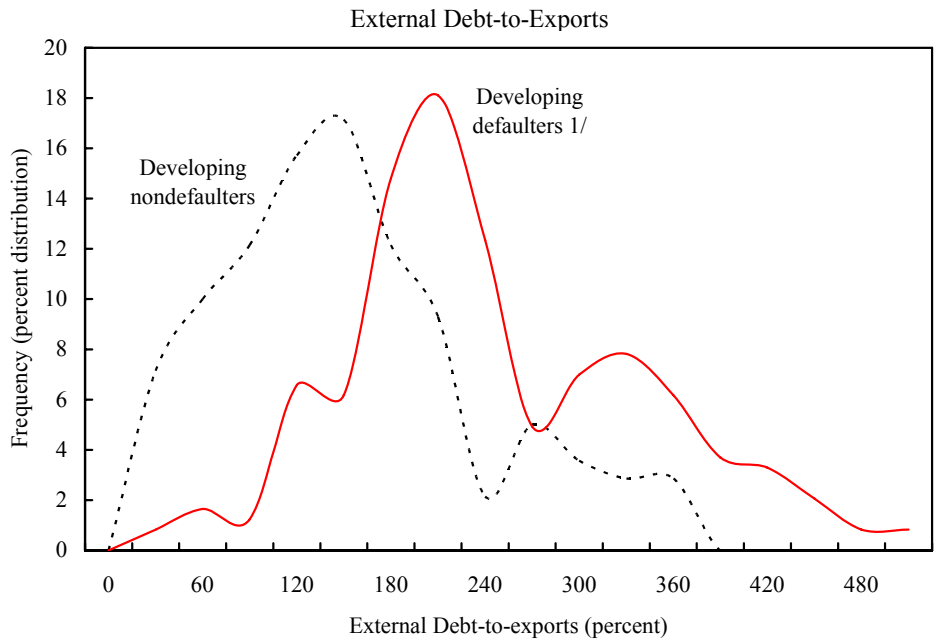
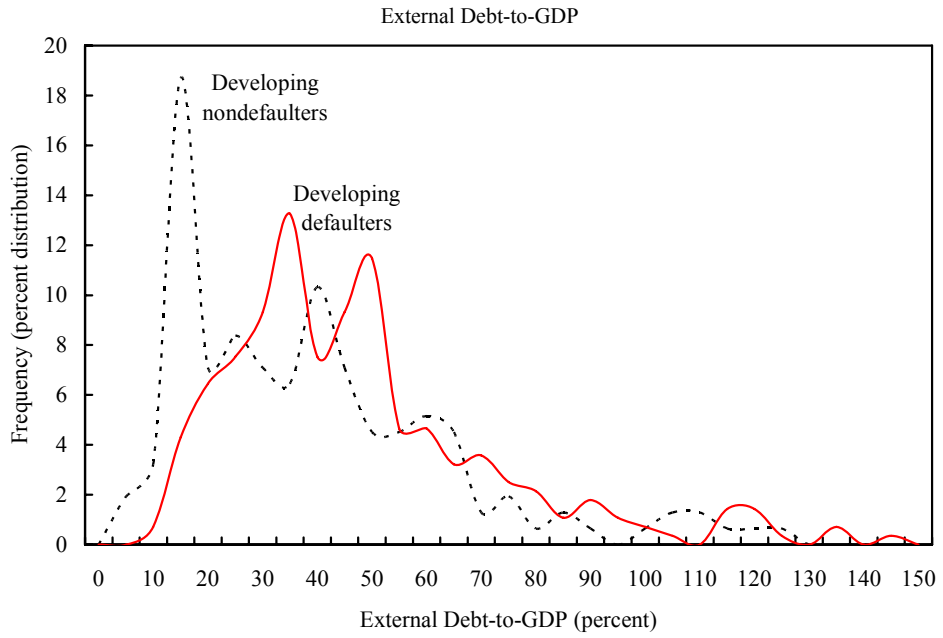
All cases marked n.a. in Table 3 are excluded from the calculations.

Sources: Table 3 and authors' calculations.

We next compare the external indebtedness profiles of emerging market countries with and without a history of defaults. Figure 1 shows the frequency distribution of external debt-to-GNP in the top panel, and external debt-to-exports in the bottom panel for two groups of countries over 1970-2000. The two distributions are very distinct and show that defaulters borrow more (even though their ratings tend to be worse at equal debt levels) than non-defaulters. The gap between external debt ratios in emerging market countries with and without a history of default widens further when external debt-to-exports are considered. It appears that those who risk default the most when they borrow (i.e., those that have the highest debt intolerance levels) borrow the most, especially when measured in terms of exports, their largest source of foreign exchange. It should be no surprise, then, that so many capital flow cycles end in an ugly credit event.



Figure 1. Defaulters and Nondefaulters, 1970-2000



Sources: International Monetary Fund, *World Economic Outlook*; and the World Bank, *Global Development Finance*.

1/ The distribution for "Developing defaulters" shown here covers 98% of the total observations in the sample.

We can use these frequency distributions to ask whether there is an external debt-to-GNP threshold for emerging economies beyond which the risk of experiencing extreme symptoms of debt intolerance rises sharply. (It will only be a first step since, as we shall see, differing levels of debt intolerance imply very different thresholds for various individual countries.) Table 5 presents a subset of the numbers that underpin Figure 1, as well as the cumulative distribution for external debt-to-GNP for defaulters and non-defaulters. Over one half of the observations for countries with a sound credit history are at levels of external debt-to-GNP below 35 percent (47 percent of the observations are below 30 percent). By contrast, for those countries with a relatively tarnished credit history, external debt-to-GNP levels above 40 percent are required to capture the majority of observations. Already, from Tables 4 and 5, and without taking into account country-specific debt intolerance factors, we can see that when emerging market external debt levels are above 30-35 percent of GNP, risks of a credit event start to increase significantly.<sup>13</sup>

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<sup>13</sup> Using an altogether different approach, an IMF (2002) study on debt sustainability comes up with external debt thresholds for developing countries (excluding the highly indebted poorest countries) that are in the neighborhood of 31 to 39 percent, depending on whether official financing is included or not. The results we will present later suggest that country-specific thresholds for debt intolerant countries should probably be much lower.

**Table 5. The Frequency Distribution of External Debt-to-GNP: 1970-2000**

<i>External debt-to-GNP Ratio (in percent)</i>	<i>Emerging market countries without a history of external default</i>		<i>Emerging market countries with a history of external default</i>	
	Density (percent of countries)	Cumulative distribution	Density (percent of countries)	Cumulative distribution
0	0	0	0	0
5	1.9	1.9	0	0
10	3.2	5.2	0.7	0.7
15	18.7	23.9	4.3	5.0
20	7.1	31.0	6.5	11.5
25	8.4	39.4	7.5	19.0
30	7.1	46.5	9.3	28.3
35	6.5	52.9	13.3	41.6
40	10.3	63.2	7.5	49.1
45	7.1	70.3	9.3	58.4
50	4.5	74.8	11.5	69.9
Memorandum items:				
Mode		14.0		28.0
Median		33.3		40.9

Sources: Authors' calculations on the basis of debt and GNP data from the World Bank, *Global Development Finance*.

### ***The components of debt intolerance***

To operationalize the measurement of debt intolerance, we focus on two indicators: the sovereign ratings reported by *Institutional Investor*, and the external debt-to-GNP ratio (or external debt-to-exports).

The Institutional Investor (IIR) ratings, which are compiled twice a year, are based on information provided by economists and sovereign risk analysts at leading global banks and securities firms. The ratings grade each country on a scale going from zero to 100, with a rating of 100 given to countries which are perceived as having the lowest chance of defaulting on its government debt obligations.<sup>14</sup> Hence, one may

<sup>14</sup> For particulars about the survey, see the September 2002 issue of *Institutional Investor*. Though not critical to our analysis below, we interpret the ratings reported in each semi-annual survey as capturing the near-term risk of default within one to two years.

construct the variable 100 minus IIR as a proxy for default risk. Unfortunately, market-based measures of default risk are only available for a much smaller range of countries and over a much shorter sample period.<sup>15</sup>

The second major component of our measure of debt intolerance consists of total external debt, scaled alternatively by GNP and exports. Our emphasis on total external debt (public and private) owes to the fact that most of the government debt in emerging markets until the late 1980s was external, and that, oftentimes, external debt that was private before a crisis becomes public after the fact.<sup>16</sup> (As Section V will illustrate, however, going forward it will be equally important to measure intolerance to the growing stock of domestic public debt.)

Figure 2 plots the major components of debt intolerance year-by-year for the period 1979-2000 for 16 emerging market economies. The vertical axis plots the external debt ratio and the horizontal axis our preferred measure of risk (i.e., 100-IIR); in the top panel external debt is scaled by GNP, while in the bottom panel it is scaled by exports.

As expected, risk rises with the stock of external debt. It is evident from Figure 2, however, that the relationship between risk and debt can be nonlinear. In particular,

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<sup>15</sup> One can use secondary market prices of external *commercial bank* debt, which are available since the mid-1980, to provide a measure of expected repayment for a number of emerging market countries. However, the Brady debt restructurings of the 1990s converted much of this bank debt to *bond* debt, so from 1992 onwards the secondary market prices would have to be replaced by the Emerging Market Bond Index (EMBI) spread, which remains the most commonly used measure of risk at present. These market-based indicators introduce a serious sample selection bias: Almost all the countries in the EMBI, and all the countries for which there is 1980s secondary debt price data, had a history of adverse credit events, leaving the control group of non-defaulters as approximately the null set.

<sup>16</sup> See the Debt Glossary at the end of the paper for a brief explanation of the various concepts of debt used in this study.

when the risk premia is very high (concretely, when the implied probability of full repayment approaches the 20 percent range), it matters little whether external debt-to-GNP is 80 percent or 160 percent or whether external debt-to-exports is 300 percent or 700 percent. This nonlinearity simply reflects the fact that below a certain threshold of the Institutional Investor Rating, typically about 24, the country has usually lost all access to private capital markets.<sup>17</sup>

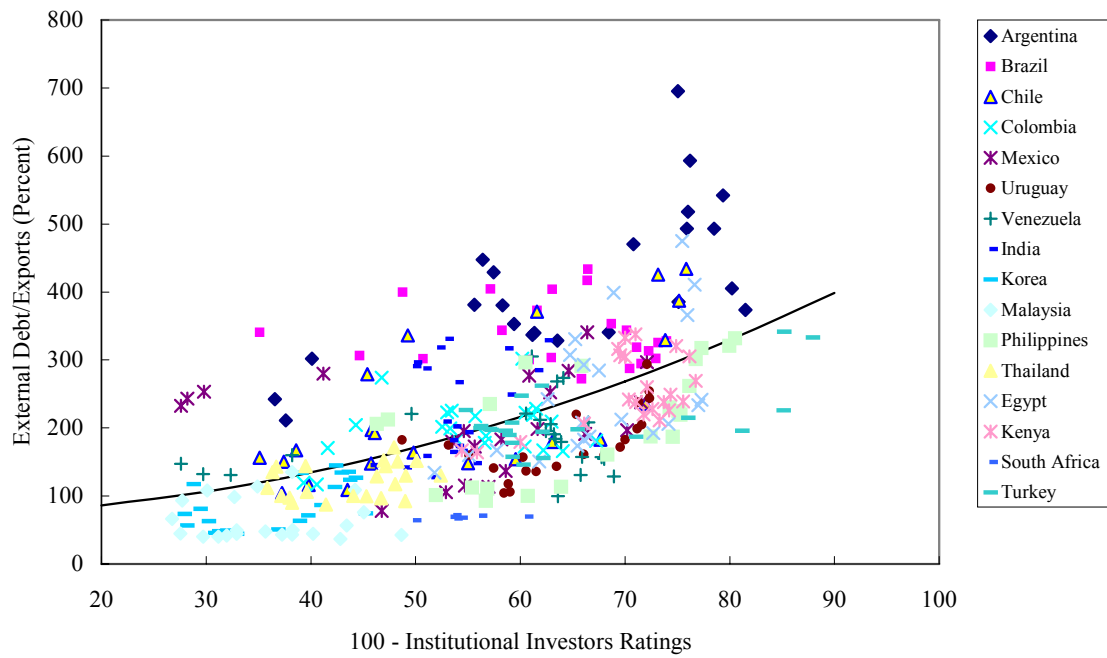
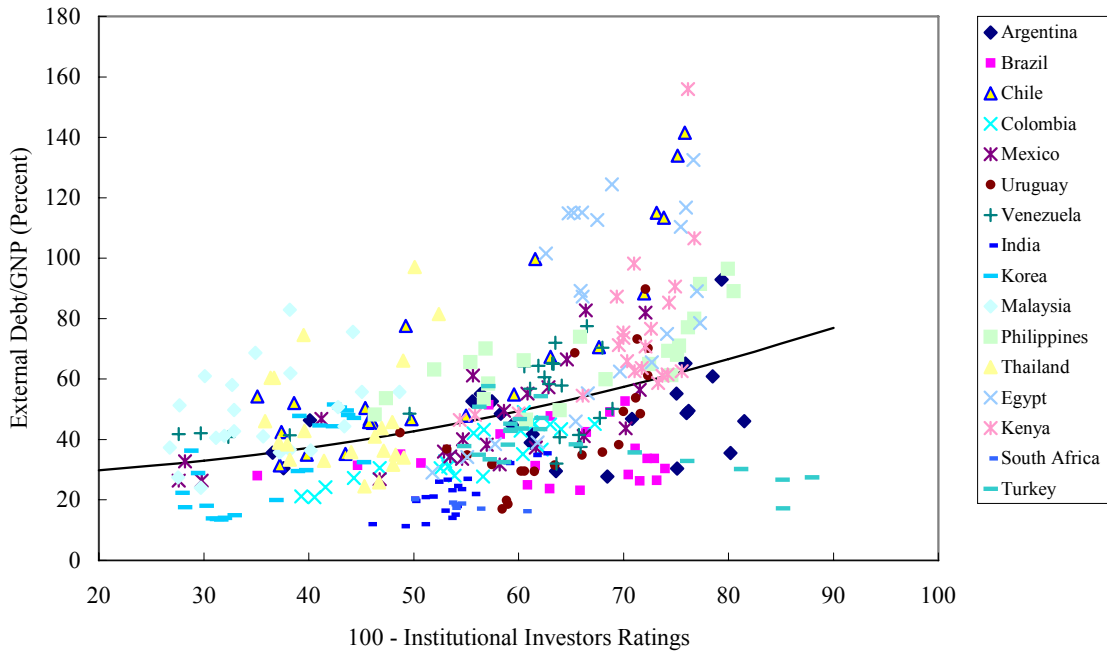
Table 6 shows the period averages of various measures of risk and external debt (the components of debt intolerance) for a representative sample of countries—our core sample (see Data Appendix). Because some researchers have argued that the “right” benchmark for emerging market countries should be given by the levels of public debt advanced economies are able to sustain, Table 6 also includes this measure for a group of advanced country non-defaulters.<sup>18</sup> The table makes plain that, while the relationship between external debt and risk may be monotonic for emerging market countries, it is clearly not the case for the public debt of advanced economies; in those countries, relatively high levels of government debt can coexist with low levels of risk. Table 6, together with Table 7, which shows the panel pairwise correlations between the two debt ratios and the three alternative measures of risk for a larger sample of developing

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<sup>17</sup> A similar picture is obtained (for a smaller sample) when one uses other measures of risk, such as secondary market prices of commercial bank debt or the EMBI spreads.

<sup>18</sup> See, for example, Reissen (1989).

Figure 2. Measuring Debt Intolerance: External Debt and Default Risk, 1979-2000



Sources: World Bank, *Global Development Finance* ; and *Institutional Investor* .

economies, also highlight that the different measures of risk present a very similar picture of both countries' relative rankings, and of the correlation between risk and debt. As anticipated by Figure 2, the correlations are uniformly positive in all regional grouping of countries, and in most instances are statistically significant.

**Table 6. Alternative Measures of Risk and External Debt Burden:  
The Components of Debt Intolerance (Period averages, as indicated)**

	<i>Institutional Investor Ratings 1979-2002</i>	<i>Secondary market prices 1986-1992</i>	<i>EMBI spread<sup>a</sup></i>	<i>Debt/GNP 1970-2000 (in percent)</i>	<i>Debt/Exports 1970-2000 (in percent)</i>
<i>Emerging market countries with at least one external default or restructuring since 1824</i>					
Argentina	34.7	34.9	1,756	37.1	368.8
Brazil	37.4	42.9	845	30.7	330.7
Chile	47.5	70.8	186	58.4	220.7
Colombia	44.6	71.4	649	33.6	193.5
Egypt	33.7	n.a.	442	70.6	226.7
Mexico	45.8	56.0	593	38.2	200.2
Philippines	34.7	54.4	464	55.2	200.3
Turkey	34.9	n.a.	663	31.5	210.1
Venezuela	41.5	59.6	1,021	41.3	145.9
<i>Group average</i>	<i>39.4</i>	<i>55.7</i>	<i>638</i>	<i>44.1</i>	<i>232.9</i>
<i>Emerging market countries with no external default history</i>					
India	53.7	n.a.	n.a.	19.0	227.0
Korea	63.4	n.a.	236	31.9	85.7
Malaysia	63.5	n.a.	166	40.1	64.9
Singapore	79.9	n.a.	n.a.	7.7	4.5
Thailand	55.7	n.a.	240	36.3	110.8
<i>Group average</i>	<i>63.2</i>	<i>n.a.</i>	<i>214</i>	<i>27</i>	<i>98.6</i>
<i>Advanced economies with no external default history<sup>b</sup></i>					
Australia	77.3	n.a.	n.a.	29.8	159.3
Canada	86.0	n.a.	n.a.	68.9	234.4
Italy	76.4	n.a.	n.a.	81.6	366.0
New Zealand	70.7	n.a.	n.a.	51.9	167.3
Norway	85.3	n.a.	n.a.	34.4	87.5
United States	92.8	n.a.	n.a.	58.4	671.7
<i>Group average</i>	<i>81.4</i>	<i>n.a.</i>	<i>n.a.</i>	<i>54.2</i>	<i>281.0</i>

<sup>a</sup> The EMBI averages are through 2002. The beginning date varies by country and is as follows: Argentina 1993; Brazil, Mexico, and Venezuela 1992; Chile, Colombia and Turkey 1999; Egypt and Malaysia 2002; Philippines and Thailand 1997, and Korea 1998.

<sup>b</sup> Total public debt (general government.)

Notes: An n.a. stands for not available.

Sources: World Bank, *Global Development Finance*, *Institutional Investor*, JP Morgan Chase, Salomon Brothers, Inc., ANZ Bank *Secondary Market Price Report*, and OECD.

**Table 7. Alternative Measures of Risk and Debt: Panel Pairwise Correlations**

	<i>100-Institutional Investor Ratings 1979-2000</i>	<i>100-Secondary Market Prices 1986-1992</i>	<i>EMBI Spread<sup>a</sup></i>
<i>Correlations with External debt-to-GNP</i>			
Full sample	0.40*	0.47*	0.55*
developing			
Africa	0.22	0.65*	0.73*
Emerging Asia	0.44*	n.a.	n.a.
Middle East	0.18	n.a.	n.a.
Western Hemisphere	0.38*	0.50*	0.45*
<i>Correlations with External debt-to-exports</i>			
Full sample	0.61*	0.58*	0.37*
Africa	0.60*	0.59*	0.67*
Emerging Asia	0.74*	n.a.	n.a.
Middle East	0.51*	n.a.	n.a.
Western Hemisphere	0.43*	0.59*	0.06

Notes: An asterisk denotes that the correlation is statistically significant at the five percent confidence level.

An n.a. stands for not available.

<sup>a</sup> Excludes Russia. For availability see footnote to Table 6.

Sources: World Bank, *Global Development Finance*, *Institutional Investor*, JP Morgan Chase, Salomon Brothers, Inc., ANZ Bank *Secondary Market Price Report*.

### ***The components of debt intolerance***

To operationalize the measurement of debt intolerance, we focus on two indicators: the sovereign ratings reported by *Institutional Investor*, and the external debt-to-GNP ratio (or external debt-to-exports).

The Institutional Investor (IIR) ratings, which are compiled twice a year, are based on information provided by economists and sovereign risk analysts at leading global banks and securities firms. The ratings grade each country on a scale going from zero to 100, with a rating of 100 given to countries which are perceived as having the



lowest chance of defaulting on its government debt obligations.<sup>19</sup> Hence, one may construct the variable 100 minus IIR as a proxy for default risk. Unfortunately, market-based measures of default risk are only available for a much smaller range of countries and over a much shorter sample period.<sup>20</sup>

### ***Debt intolerance: clubs and regions***

We next use the components of debt intolerance—IIR risk ratings and external debt ratios—in a two-step algorithm mapped in Chart 1 to define creditors’ clubs and vulnerability regions. We begin by calculating the mean (45.9) and standard deviation (21.8) of the IIR for 53 countries over 1979-2002, and use these metrics to loosely group countries into three “clubs.”<sup>21</sup> Those countries that have an average IIR over the period 1979-2002 at or above 67.7 (the mean plus one standard deviation) form club “A,” a club that comprises countries that enjoy virtually continuous access to capital markets—i.e., all advanced economies. As their repayment history shows (Table 1), these countries are the least debt intolerant. The opposite extreme, club C, is comprised of those countries .

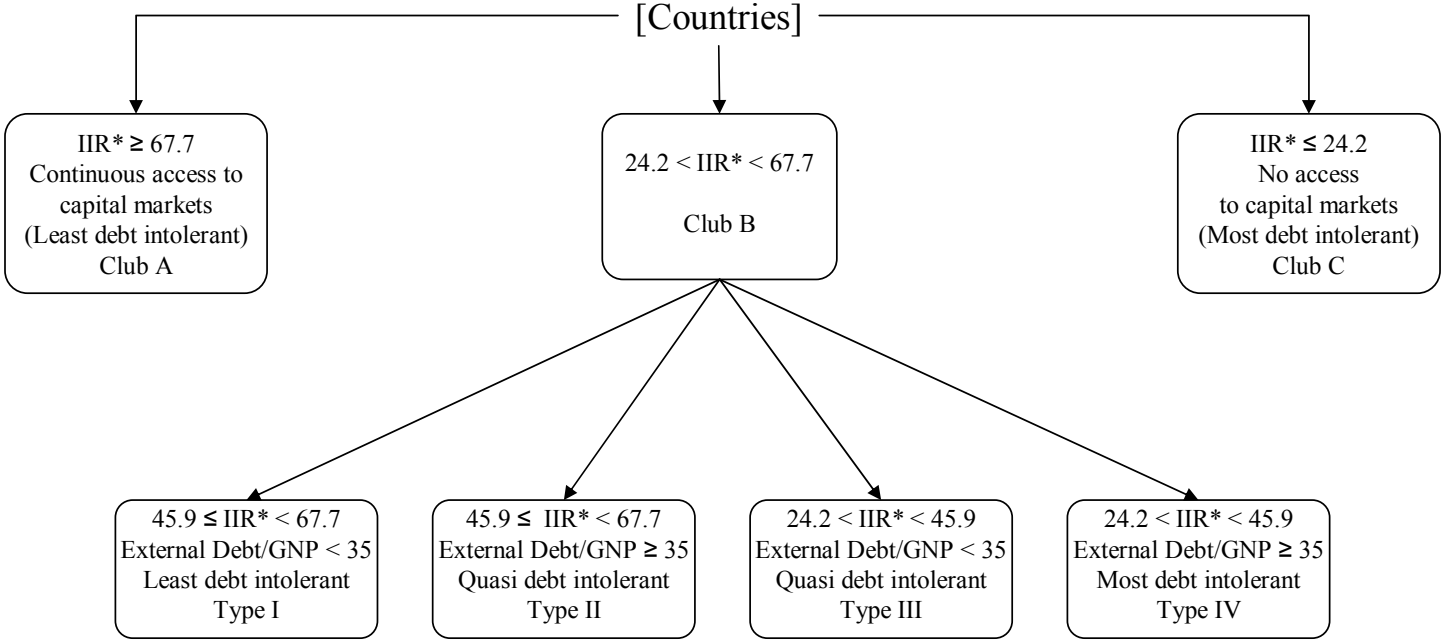
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<sup>19</sup> For particulars about the survey, see the September 2002 issue of *Institutional Investor*. Though not critical to our analysis below, we interpret the ratings reported in each semi-annual survey as capturing the near-term risk of default within one to two years.

<sup>20</sup> One can use secondary market prices of external *commercial bank* debt, which are available since the mid-1980, to provide a measure of expected repayment for a number of emerging market countries. However, the Brady debt restructurings of the 1990s converted much of this bank debt to *bond* debt, so from 1992 onwards the secondary market prices would have to be replaced by the Emerging Market Bond Index (EMBI) spread, which remains the most commonly used measure of risk at present. These market-based indicators introduce a serious sample selection bias: Almost all the countries in the EMBI, and all the countries for which there is 1980s secondary debt price data, had a history of adverse credit events, leaving the control group of non-defaulters as approximately the null set.

<sup>21</sup> The average for each country is shown in Appendix Table A.1.

Chart 1. Defining Debtors' Clubs and External Debt Intolerance Regions



\* IIR = Average long-term value for Institutional Investors' Ratings

whose average IIR is below 24.2 (the mean minus one standard deviation). This “cut-off” club includes countries whose primary sources of external financing are grants and official loans; countries in the club are so debt intolerant that markets give them only sporadic opportunities to borrow. The remaining countries are in club (B), the main focus of our analysis, and exhibit varying degrees of debt intolerance.<sup>22</sup> These countries occupy the “indeterminate” region of theoretical debt models; the region where default risk is non-trivial, and where self-fulfilling runs are a possible trigger to a crisis. Club B is large and includes both countries that are on the cusp of “graduation” as well as those that may be on the brink of default. For this reason, this “indeterminate” club requires further discrimination. Our preferred risk measure is no longer a sufficient statistic, and information on the extent of leveraging (the second component of debt intolerance) is necessary to pin down more precisely the relative degree of debt intolerance within this club

Hence, in the second step, our algorithm further subdivides the “indeterminate” club B into four regions or groups, ranging from the least to the most debt intolerant. The region of least debt intolerance include the (Type I) countries with a 1979-2002 average IIR above the mean (45.9) but below 67.7 **and** external debt-to-GNP below 35 percent (a threshold which, as discussed, accounts for over one half the observations for the non-defaulters over 1970-2000.) The next region includes (Type II) countries where the IIR is above the mean but external debt-to-GNP is above 35 percent. This is the second least debt intolerant group. The region that follows encompasses (Type III) countries where the IIR is below the mean but above 24.2, and where external debt is below 35 percent of

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<sup>22</sup> One is reminded of Groucho Marx’s aphorism “I wouldn’t want to be a member of a club that would have me.” As will be shown, membership in club B is not a privilege.

GNP. Lastly, the highest debt intolerance region is comprised by those (Type IV) countries with an IIR below the mean and external debt levels above 35 percent of GNP. Countries in the Type IV region can easily get bounced into the no access club. For example in early 2000, Argentina's IIR was 43 and its external debt-to-GNP was 51 percent, making it Type IV. As of September 2002, Argentina's rating had dropped to 15.8 indicating that the country had "reverse-graduated" to club C. As we shall see, countries do not graduate to higher clubs easily and, indeed, it can take many decades of impeccable repayment and low debt levels to graduate from club B to club A.

### **III. DEBT INTOLERANCE: THE ROLE OF HISTORY**

This section begins by offering some basic insights into the historical origins of country risk, which some have mislabeled as "original sin."<sup>23</sup> In particular, we focus on countries' credit and inflation histories. Our core results are used to: (a) illustrate how to calculate country-specific debt thresholds—in contrast to the coarse 35 percent external debt to GNP ratio derived earlier; (b) show how countries in the "indeterminate club" shift across debt intolerance regions over time; (c) illustrate how countries may "graduate" into a better club; and (d) show how a simple summary statistic can rank countries in the "indeterminate club" according to their relative degree of debt intolerance.

#### ***Historical determinants of country risk***

To prepare to investigate the link between (external) debt credit and inflation history, and sovereign risk econometrically, we broadened our sample from the 20 countries listed in Table 6 to a total of 53 countries; see Appendix A1. The IIR rating, our

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<sup>23</sup> See, for example, Eichengreen, Hausmann and Panizza (2002).

preferred measure of country risk, was used as the dependent variable in all the regressions. To measure credit history, we calculated for each country the percent of years in the sample where its external debt was in a state of default or undergoing a restructuring for two different periods: 1824-1999 and 1946-1999. Another indicator of credit history we use is the number of years since the last external debt default (or restructuring). We also calculated the percent of 12-month periods where inflation was above 40 percent during 1958-2000.<sup>24</sup> While it is quite reasonable to expect that debt intolerance may itself lead to a higher probability of default (because markets charge a higher premium on borrowing) or a higher probability of inflation (because often there are no other sources of deficit financing), we are not too concerned about the potential endogeneity of these two regressors, as they are largely predetermined relative to the main sample period—1979-2000.<sup>25</sup>

However, using external debt-to-GDP (or external debt-to-exports), which is an average over 1970-2000, as a regressor does pose a potential endogeneity problem, so we report the results of both the least squares (LS) and instrumental variable (IV) estimation (where the average debt-to-GNP ratio during 1970-1978 was used as an instrument). As White's test revealed heteroskedasticity in the residuals, we corrected accordingly to ensure the consistency of the standard errors. To investigate whether the differences in debt tolerance in countries in club A and everyone else are systematic, we also use a

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<sup>24</sup> For a discussion of why 40 percent seems a reasonable threshold for inflation see Easterly (2001) and Reinhart and Rogoff (2002).

<sup>25</sup> An obvious way of extending this analysis of credit history would be to make a distinction between peacetime and wartime defaults and gather additional information about governments' violation of other contracts, such as defaults on domestic debt and/or forcible conversions of dollar deposits into local currency (as those that occurred in Argentina in 2002, Bolivia in 1982, Mexico in 1982, and Peru in 1985).

“club A” dummy variable in the regressions, allowing club A countries to have a different slope coefficient on the debt-to-GNP ratio.

The top panel of Table 8 defines each variable; the bottom panel presents the results of six different specifications of the cross-country regressions. The first column numbers the regressions. The next six columns report the coefficients of the explanatory variables and their corresponding  $t$ -statistics (in parentheses), while the last column shows the  $R^2$  of the regression. As the table illustrates, less than a handful of variables can account for a significant portion (about 75 percent) of the cross-country variation in country risk, as measured by the Institutional Investor ratings. As expected, a poor credit or inflation track record lowers the rating and increases risk. In the regressions, all but the debt-to-GNP coefficients are constrained to be the same for club A (primarily the advanced economies) and all other countries. One common and robust result across the six cross-country regressions reported in the table is that the external debt-to-GNP ratio enters with a negative (and significant) coefficient for all the countries in clubs B and C, while it has a positive coefficient for the advanced economies in club A.<sup>26</sup> As we will show next, this result is robust to the addition of a time dimension to the regressions. Although not reported here for the sake of brevity, these results are equally robust to the use of external debt-to-exports in lieu of debt-to-GNP as a regressor.

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<sup>26</sup> The estimated coefficient for club A countries captures both institutional and structural factors specific to those countries as well as the different concept of debt (total public debt as opposed to total external debt) used for those cases (see Debt Glossary).

**Table 8. External Debt, Risk, and Debt Intolerance:  
The Role of History and “Clubs:” Cross-Section Results**

The regression is:  $Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + u_i$ , where the  $X$ s are defined below, the subscript  $i$  denotes the country, and  $u_i$  is a disturbance term.

$X_1$  = Percent of 12-month periods of inflation at or above 40 percent since 1948.

$X_2$  = Percent of years in a state of default or restructuring since 1824.

$X_3$  = Percent of years in a state of default or restructuring since 1946.

$X_4$  = Number of years since last default or restructuring.

$X_5$  = External debt/GNP (1970-2000 average) x Non-Club A Dummy

$X_6$  = External debt/GNP (1970-2000 average) x Club A Dummy

$Y$  = Institutional Investor Ratings (1979-2000 average)

53 observations

<i>Regression Number</i>	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$	$X_6$	<i>Adjusted R<sup>2</sup></i>
<i>Least Squares Estimates, Robust Errors</i>							
1	-0.16 (-2.97)	-0.21 (-2.10)			-0.33 (-5.40)	0.28 (3.63)	0.77
2	-0.16 (-1.87)		-0.17 (-1.53)		-0.34 (-4.49)	0.29 (3.68)	0.76
3	-0.11 (-1.37)			0.05 (1.93)	-0.29 (-4.03)	0.27 (3.62)	0.79
<i>Instrumental Variable Estimates, Robust Errors</i>							
4	-0.14 (-1.93)	-0.12 (-1.33)			-0.41 (-3.52)	0.31 (2.12)	0.74
5	-0.13 (-1.26)		-0.12 (-0.86)		-0.39 (-2.51)	0.34 (2.30)	0.74
6	-0.08 (-0.65)			0.05 (1.91)	-0.33 (-2.02)	0.33 (2.23)	0.77

Notes:  $t$ -statistics in parentheses.

Sources: Beim and Calomiris (2001), *Institutional Investor*, *International Monetary Fund*, *International Financial Statistics*, Standard and Poor's *Credit Week* and *Debt Cycles in the World Economy* (1992), and authors' calculations.

Table 9 shows the results of two panel regressions (estimated with fixed effects and robust standard errors), where the IIR was regressed against the (external) debt-to-GNP and three time dummies for periods roughly corresponding to the phases of the most recent debt cycle: pre-debt crisis (1980-1982); debt crisis and Brady plan resolution (1983-1993); and post crisis and resumption of borrowing (1994-2000). Regressions

including year-by-year dummies (reported in Appendix Table A.2) revealed that the Institutional Investor data naturally demarcates these three distinct sub-periods. The first regression includes 38 of the 53 countries in the cross-section regressions (these are countries in clubs B and C), while the second regression also includes 15 countries in club A and (as before) allows them to have a different slope coefficient on the debt-to-GNP ratio.

**Table 9. Debt and Risk: Evidence from Panel Data: 1979-2000**

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The regression is:  $Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + u_{it}$  where the  $X$ s are defined below, the subscripts  $i$  and  $t$  denote the country and year, respectively, and  $u_{it}$  is a disturbance term.

$X_1$  = Dummy = 1 1980-1982, 0 otherwise  
 $X_2$  = Dummy = 1 1983-1993, 0 otherwise  
 $X_3$  = Dummy = 1 1994-2000, 0 otherwise  
 $X_4$  = Debt/GNP x Non Club A Dummy  
 $X_5$  = Debt/GNP x Club A Dummy  
 $Y$  = Institutional Investor Ratings

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<i>Regression Number</i>	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$	<i>Number of observations</i>	<i>Adjusted R<sup>2</sup></i>
<i>Least Squares with Fixed Effects and Robust Errors</i>							
1	-3.01 (-2.06)	-12.22 (-8.98)	-7.01 (-5.13)	-0.13 (-10.37)		769	0.78
2	-3.61 (-2.90)	-12.33 (-10.69)	-6.62 (-5.60)	-0.11 (-9.24)	0.01 (0.04)	1030	0.91

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Notes:  $t$ -statistics in parentheses.

Sources: Beim and Calomiris (2001), *Institutional Investor*, *International Monetary Fund*, *International Financial Statistics*, Standard and Poor's *Credit Week* and *Debt Cycles in the World Economy* (1992), and authors' calculations.

A central finding of the cross-section regressions is confirmed by the panel regressions (including those reported in the Appendix): debt is significantly and negatively related to sovereign risk for the debt intolerant countries in clubs B and C. In the regression that includes the advanced economies, which make up most of club A, the coefficient on debt



is positive—although unlike the cross-section results, it is not statistically significant. The coefficients for the three sub-periods are all statistically significant and have an intuitive interpretation. Average IIRs were higher across the board prior to the debt crises of the 1980s, ratings plummet as the debt crisis unfolds and only recover partially in the 1990s, never quite reaching their pre-crises levels. Thus, debt intolerance is long lived.

### ***Country-specific debt thresholds***

We now use some of our core results to illustrate that while an external debt to output ratio of 35 is a plausible debt “safety” threshold for those countries that have not made it to club A, our analysis implies that countries with a weak credit history may become highly vulnerable at much lower levels of external debt. To illustrate this basic but critical point, we perform the following exercise. We use the estimated coefficients from regression (1) in Table 8, jointly with the actual values of the regressors, to construct estimated (predicted) values of the Institutional Investor Index for varying levels of external debt-to-GNP for each country. Table 10 illustrates the exercise for the cases of Argentina and Malaysia for levels of external debt ranging from 0 to 45 percent of GNP. Until the Argentine default of December 2001, both countries were part of club B.

The exercise shows clearly that Argentina’s precarious debt intolerance situation has persisted for longer than Malaysia’s. Recalling that, within club B, Type I region is the safest (the least debt intolerant), Argentina only remains in that relatively safe region for external debt levels below 20 percent, while Malaysia remains on for debt levels below 35 percent, and is still in (relatively safe) region II at levels of 40 percent. The pattern and contrast shown in Table 10 is characteristic of a much broader number of cases, with Argentina being representative of the many countries with a relatively weak

credit and inflation history and Malaysia being representative of the cases where there is no history of default or high inflation.

**Table 10. Country-specific External Debt Thresholds Implied by Regression Results: An Illustration for Argentina and Malaysia**

<i>External debt/GNP (percent)</i>	<i>Argentina</i>		<i>Malaysia</i>	
	<i>Estimated Institutional Investor</i>	<i>Region Type</i>	<i>Estimated Institutional Investor</i>	<i>Region Type</i>
0	51.4	I	61.1	I
5	49.3	I	59.0	I
10	47.3	I	57.0	I
15	45.2	III	54.9	I
20	43.2	III	52.9	I
25	41.1	III	50.8	I
30	39.1	III	48.8	I
35	37.0	III	46.7	II
40	34.9	IV	44.7	IV
45	32.9	IV	42.6	IV

Notes: Calculations are based on the coefficients from regression (1) in Table 8.

For countries in club B [ $24.2 < \text{Institutional Investor Rating (IIR)} < 67.7$ ] the four regions (from least to most vulnerable) defined in Chart 1 are: Least debt intolerant, Type I ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} < 35$ ); quasi debt intolerant, Type II ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} > 35$ ); quasi debt intolerant, Type III ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} < 35$ ) and; most debt intolerant Type IV ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} > 35$ .)

Source: Authors' calculations.

### ***Moving in and out of debt intolerance regions***

To illustrate how countries in the indeterminate club B can become more or less vulnerable over time, Table 11 presents an exercise similar to that shown in Table 10 for the case of Brazil. The main difference is that this time, rather than using a hypothetical debt level (as in Table 10), we calculate the IIR estimates using actual external debt-to-GNP ratios for each year. In addition to reporting the estimated Institutional Investor rating, we also report the actual IIR rating as well as the difference between the two. The last two columns show the actual region along the lines described in Chart 1 (based on external debt and the actual values for the IIR) and the estimated region (based on

external debt and estimated IIR). The shaded area indicates the years in which Brazil's external debt was in default or undergoing a restructuring, while the bolded characters in the last two columns indicate the years where there are discrepancies between the actual and the estimated region.

A pattern worth noticing is that the actual IIR ratings for Brazil start quite high in 1979 and, though declining, remained quite high prior to the default/restructuring of 1983. Indeed, the gap between actual and estimated IIR is highest in the run-up to the credit event. According to the actual IIR and debt, Brazil was in the relatively safe region II on the eve of the 1983 default, while according to our estimates it was in the most debt intolerant region (region IV). After the credit event, Brazil remained in the most debt intolerant region for a few years by both measures. It is noteworthy that, just as the actual ratings were well *above* the estimated IIR in the years prior to default, the actual IIRs were well *below* our measure for the years following the default. This pattern is also evident in many other episodes in our sample, and lends support to the view that ratings tend to be procyclical. Note that for most years (the run-up to the 1983 default and 2001 being the exceptions), the predicted debt intolerance region was the same as the actual.

As observed above, there are some years where the actual IIR is considerably higher than the estimated rating obtained from our simple model. On the whole, however, these gaps are (a) not persistent over time and (b) not systematic in any one direction. Nonetheless, for some countries we do observe consistent, persistent and sizable positive gaps between the actual and the predicted IIR. One interpretation is that these countries either have "graduated," or are in the process of "graduating," from club B.

**Table 11. Shifting Sands—Transitions Across Debt Intolerance Regions: An Illustration for Brazil**

<i>Year</i>	<i>Actual IIR</i>	<i>Estimated IIR</i>	<i>Actual IIR - Estimated</i>	<i>Actual region</i>	<i>Estimated region</i>
1979	64.9	36.9	27.9	<b>I</b>	<b>III</b>
1980	55.4	35.5	19.9	<b>I</b>	<b>III</b>
1981	49.3	35.2	14.1	<b>II</b>	<b>IV</b>
1982	51.4	34.1	17.2	<b>II</b>	<b>IV</b>
1983	42.9	27.9	15.0	IV	IV
1984	29.9	27.7	2.2	IV	IV
1985	31.3	29.2	2.1	IV	IV
1986	33.6	31.7	1.9	IV	IV
1987	33.6	31.6	2.0	III	III
1988	28.9	33.6	-4.7	III	III
1989	28.5	37.8	-9.4	III	III
1990	26.9	37.7	-10.8	III	III
1991	26.1	36.1	-10.0	III	III
1992	27.1	34.7	-7.6	III	III
1993	27.8	34.6	-6.9	III	III
1994	29.6	36.8	-7.2	III	III
1995	34.2	38.9	-4.8	III	III
1996	37.1	38.7	-1.6	III	III
1997	39.2	38.1	1.0	IV	IV
1998	38.4	35.8	2.6	IV	IV
1999	37.0	29.5	7.4	III	III
2000	41.8	31.4	10.4	III	III
2001	41.8	28.6	13.2	<b>III</b>	<b>IV</b>

Notes: Calculations are based on the coefficients from regression (1) in Table 8.

For countries in club B [ $24.2 < \text{Institutional Investor Rating (IIR)} < 67.7$ ] the four regions (from least to most vulnerable) defined in Chart 1 are: Least debt intolerant, Type I ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} < 35$ ); quasi debt intolerant, Type II ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} > 35$ ); quasi debt intolerant, Type III ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} < 35$ ) and; most debt intolerant Type IV ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} > 35$ .)

Shaded area denotes years in default or restructuring status while bolded numbers in the last two columns highlight the years where there are differences between the actual and estimated region.

Sources: *Institutional Investor* (various issues) and authors' calculations.

### ***Graduating from debt intolerance: some suggestive evidence***

To explore the countries among our sample that are plausible graduation candidates, we calculated the difference between the actual and predicted IIR averaged over the years 1992-2000—roughly the second half of the estimation period. The five countries with the largest gaps during this period are shown, in descending order, in Table 12. Not surprisingly,

Greece and Portugal stand out as the most obvious possible cases of graduation from club B to club A. A distant third and fourth are Malaysia and Thailand (1997-1998 crises notwithstanding), as both are countries with no history of default or high inflation. Chile, the most consistent good performer in Latin America ranks fifth, possibly suggesting that it has begun to decouple from its long history of high inflation and adverse credit events.

**Table 12. Persistent and Sizable Underprediction of Country Risk (IIR)  
Evidence of Graduation from Debt Intolerance? 1992-2000 Averages**

	<i>Estimated region</i>	<i>Actual region</i>	<i>Actual IIR minus estimated IIR</i>
Greece	IV	II	41.1
Portugal	IV	II	35.3
Thailand	IV	II	22.4
Malaysia	IV	II	21.2
Chile	IV	II	19.8
Memorandum items:			
Mean for full sample			6.1
Standard deviation for full sample			12.6
Mean excluding the top five countries			2.5

Notes: Calculations are based on the coefficients from regression (1) in Table 8.

For countries in the club B [ $24.2 < \text{Institutional Investor Rating (IIR)} < 67.7$ ] the four regions (from least to most vulnerable) defined in Chart 1 are: Least debt intolerant, Type I ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} < 35$ ); quasi debt intolerant, Type II ( $45.9 \leq \text{IIR} < 67.7$  and  $\text{Debt/GNP} > 35$ ); quasi debt intolerant, Type III ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} < 35$ ) and; most debt intolerant Type IV ( $25.2 \leq \text{IIR} < 45.9$  and  $\text{Debt/GNP} > 35$ .)

Sources: *Institutional Investor* (various issues) and authors' calculations.

### ***Ranking debt intolerance in the "indeterminate club"***

We have presented evidence supporting the notion that there is a group of countries that are in an indeterminate club B that spans relative "safe" regions (Type I) to more precarious regions where adverse credit events become increasingly likely. That is, countries have varying degrees of debt intolerance. A more continuous measure of debt intolerance is presented in Table 13. The table provides the average ratio of external debt

to GNP divided by the average IIR, and the average ratio of external debt to exports divided by the average IIR. Regardless of which of the two measures of debt intolerance one chooses, the countries with the weaker credit history register the highest levels of debt intolerance. Thus, for example, the average (debt-to-GNP)/IIR ratio is more than twice as high for countries with a default track record than for those that have avoided default. The difference in the summary indicator of debt intolerance between the two groups is much greater when one looks at the ratio that uses debt-to-exports as the numerator. These simple summary statistics could therefore be useful to compare the relative degree of debt intolerance across countries (as done here), and over time for any given country.<sup>27</sup>

**Table 13. Ranking Debt Intolerance in Club B: Period averages, 1979-2000**

	<i>(External debt/GNP)/ Institutional Investor Rating</i>	<i>(External debt/Exports)/ Institutional Investor Rating</i>
<i>Countries with at least one external default or restructuring since 1824</i>		
Argentina	1.1	10.6
Brazil	0.8	8.8
Chile	1.2	4.7
Colombia	0.8	4.3
Egypt	2.1	6.7
Mexico	0.8	4.4
Philippines	1.6	5.8
Turkey	0.9	6.0
Venezuela	1.0	3.5
<i>Group average</i>	<i>1.1</i>	<i>6.1</i>
<i>Developing countries with no external default history</i>		
India	0.4	4.2
Korea	0.5	1.4
Malaysia	0.6	1.0
Singapore	0.1	0.1
Thailand	0.7	2.0
<i>Group average</i>	<i>0.5</i>	<i>1.7</i>

Sources: World Bank, *Global Development Finance, Institutional Investor*.

<sup>27</sup> Chart 1 employs debt/GDP as a metric for dividing regions within club B, but a similar exercise can be performed for debt/exports.

#### IV. DEBT SUSTAINABILITY AND DEBT REVERSALS

Thus far, our analysis has focused on quantifying and explaining external debt intolerance. To reiterate, the basic premise is that, because of debt intolerance, some countries periodically have difficulties repaying their debts at their original terms, even at debt levels that would be moderate for non-debt intolerant countries. In this section we first discuss the implications of debt intolerance for standard debt sustainability analyses, and then turn our attention to what we call debt reversals—or episodes during which countries managed to significantly reduce their external debt relative to GNP. The latter analysis will show that debt intolerant countries very rarely achieve significant reductions in their debt burden through sustained growth or lower interest rates without some kind of “credit event.” In addition, the analysis will show that following a credit event, if unchecked, governments in emerging market countries often quickly amass debt so that debt intolerance symptoms re-emerge, often leading to serial default. This evidence will uncover some critical shortcomings of standard sustainability exercises.

##### *Implications of debt intolerance for debt sustainability analysis*

How does one square our proposed measures of debt intolerance, and more broadly, the existence of debt intolerance, with standard approaches to assessing debt sustainability as practiced in both the public and private sector? Standard debt sustainability analysis as applied to a country’s external debt, works off the simple accounting relationship:

$$(1) D(t+1) = [1 + r(t)]D(t) - TB(t),$$

where  $D(t)$  is a country's external debt at time  $t$ ,  $TB$  is its trade balance surplus, and  $r(t)$  is the interest rate paid by the country on its external debt. Simple manipulation leads to the steady state expression:

$$(2) \quad TB/Y = (r-g)(D/Y),$$

where  $TB/Y$  is the steady state trade surplus to output ratio needed to stabilize the external debt ratio at  $D/Y$ , and  $g$  is the growth rate of output. (A similar calculus applies to calculating sustainable paths for government debt.) It is well recognized that standard debt sustainability analysis tend to be overly sanguine because they do not sufficiently allow for the kinds of real world shocks faced by emerging markets countries (e.g., confidence shocks, political shocks, terms of trade shocks), and efforts have been made to find ways to "stress-test" sustainability calculations.<sup>28</sup>

Such efforts are useful, but our analysis of debt intolerance suggests that it is also crucial to take into account other factors. First, those analyses would need to reflect that the interest rate a country has to pay on its debt is an endogenous variable that depends, among other things, on the debt-to-output (or debt-to-exports) ratio. Because the *market component* of the interest rate can rise very sharply with the level of debt (the rate charged by official creditors such as the international financial institutions typically does not change), a trajectory that seems marginally sustainable according to standard calculations (not an uncommon situation to say the least) may in fact be much more problematic when debt intolerance is taken into account. This is particularly likely to be

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<sup>28</sup> See IMF (2002) for a recent discussion of these approaches. As noted, the approaches sometimes focus on government debt rather than external debt, but the issues raised here are similar for both. See Williamson (2002) and Goldstein (2003) for applications of the standard framework to Brazil's government debt.



the case in situations where a country's debt-to-GNP ratio is initially projected to rise into the future, and only later projected to fall (again, a very common situation).

Second, those analyses would need to take into account that the initial level of debt (scaled by output or exports) may already exceed, or be close to exceeding, what history suggests is the tolerable debt burden for a particular country. Sustainability analyses where the initial level of debt or the initial rise in  $D/Y$  takes a club B country into a region of extreme debt intolerance (i.e., region IV) are not likely to be meaningful or useful. Once a country is in the "risk of default" region identified in sovereign debt models (e.g., those of Obstfeld (1994), Velasco (1996), Morris and Shin (2001) and Jahjah and Montiel (2003)) and approximated by our earlier analysis, there is a risk of both higher interest rates and sudden loss of access to market financing. And, as we will see below, the probability that a "virtuous cycle" of falling interest rates and high growth will take the country's debt burden back to a "safe" region is, unfortunately, typically low.

### *Identifying debt reversals*

To identify episodes of large debt reversals for middle and low income countries over the period 1970-2000, we select all episodes where the ratio of external debt-to-GNP fell 25 percentage points or more within any three-year period and then ascertain whether the decline in debt-to-GNP was caused by a fall in the numerator, a rise in the denominator, or some combination of the two.<sup>29</sup> To exclude cases where the decline in the debt-to-output ratio was primarily driven by changes in the nominal value of dollar GNP, we consider only those episodes where either: (1) the decline in the dollar value of external debt was 10

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<sup>29</sup> Our basic results appear reasonably robust to our choice of "windows" of 25 percent decline and three years—see the analysis of Brady plan countries below, however.

percent or more over the three year window, or (2) average growth in the three-year period was five percent or higher. This two-stage approach allows us to identify the proximate causes of the debt reversal. If it is a decline in debt, it may owe to either repayment or some type of reduction in the present value of debt (i.e., a restructuring); alternatively, if the decline was due to growth it suggests that the country grew out of its debt. We conducted the exercise for both low and middle income developing economies.

The algorithm yielded a total of 53 debt reversal episodes for the period 1970-2000, 26 of them corresponding to middle income countries and another 27 to the low income countries.

### *The debt reversal episodes*

Table 14 lists the debt reversal episodes in middle income emerging market countries with populations of at least one million, separating cases that involved a “credit event” from those that did not.<sup>30</sup> The first two columns list the country and the year in which the reversal episode began (year  $t$ ); the next two columns show the external debt-to-GNP ratio at the beginning of the episode, and at the end of the episode ( $t+3$ ); the fifth column presents the cumulative change in debt (in US dollars) over the three-year window and the sixth column shows the average real GDP growth over the episode. The main reason(s) why the external debt-to-GNP ratio fell more than 25 percentage points, and the debt-to-GNP ratio as of 2000, complete the table. The figures in bold in the last column indicate those cases where the debt-to-GNP ratio in the year 2000 was higher than at the end of the reversal episode ( $t+3$ ). In each panel, the episodes are listed in descending order by the size of the nominal debt reduction (column 5).

#### **Table 14. Episodes of Falling External Debt, 1970-2000**

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<sup>30</sup> A similar table summarizing the debt reversals of the low income countries are available from the authors upon request.

**Middle-income Countries with a Population of at Least One Million**

Country	Start of Episode (year t)	Debt/GNP (percent)		Cumulative change in Total Debt (US\$ billion)	Average real GDP growth during episode (percent)	Main reasons for fall in Debt/GNP ratio	Latest Debt/GNP <sup>a</sup> (percent)
		t	t+3				
<i>Debt default/restructuring during the episode</i>							
Russia	1999	96	67	-14.06	5.9	Debt reduction; output	
growth	67						
Egypt	1987	110	79	-11.13	3.4	Debt reduction	29
Iran	1993	42	16	-6.80	3.1	Net repayments	8
Jordan	1991	249	129	-1.84	6.9	Debt reduction; output	
growth	99						
Bulgaria	1992	116	81	-1.58	-6.3	Debt reduction	<b>86</b>
Costa Rica	1987	111	69	-0.97	4.3	Debt reduction	31
Bolivia	1988	113	80	-0.84	4.3	Debt reduction	72
Chile	1985	142	88	-0.80	5.7	Debt reduction; output	
growth	54						
Jamaica	1990	125	93	-0.57	2.3	Debt reduction	61
Paraguay	1987	69	39	-0.42	4.9	Debt reduction	<b>41</b>
Gabon	1978	70	32	-0.38	-8.0	Net repayments	<b>94</b>
Albania	1992	98	18	-0.18	2.7	Debt reduction; GDP	
valuation	<b>20</b>						
Panama	1989	135	100	0.03	6.8	Output growth	75
Philippines	1986	96	68	0.45	5.2	Output growth	63
Morocco	1985	129	98	5.01	5.6	Output growth	55
<i>No debt default/restructuring during the episode</i>							
Thailand	1998	97	66	-25.24	0.1	Net repayments	66
Korea	1985	52	20	-11.42	9.7	Net repayments	<b>30</b>
Malaysia	1986	83	44	-5.60	6.4	Net repayments	<b>51</b>
Papua New Guinea	1992	93	56	-1.28	8.7	Net repayments	<b>71</b>
Lebanon	1990	51	17	-0.43	9.1	Net repayments	<b>59</b>
Botswana	1976	42	16	-0.03	13.5	Debt valuation; output	
growth	8						
Swaziland	1985	68	40	0.02	9.3	Output growth	17

<sup>a</sup> Estimates for end-2000.

Sources: World Bank Debt Tables (various issues), IMF's *World Economic Outlook*; Standard & Poor's (2000); Beim & Calomiris (2001.)

Of the 22 debt reversals detected in middle income emerging market countries, 15 coincided with some type of default or restructuring of external debt obligations. In six of the seven episodes that did not coincide with a credit event, the debt reversal was effected through net debt repayments; only in one of these episodes (Swaziland, 1985) did the debt ratio decline because the country “grew” out of its debts! Growth was also the principal factor explaining the decline in debt ratios in three of the 15 default/

restructuring cases: Morocco, Panama, and the Philippines. Overall, this exercise shows that countries typically do not grow out of their debt burden—yet another reason to be skeptical of overly sanguine standard sustainability calculations for debt intolerant countries.

Of those cases involving credit events, Russia and Egypt obtained (by far) the largest reduction in their nominal debt burden in their restructuring deals, at US\$ 14 billion and US\$ 11 billion, respectively. Two Asian crises countries (Thailand and Korea) engineered the largest debt repayments among the episodes where a credit event was avoided.

Conspicuously absent from the large debt reversal episodes shown in Table 14 are the well known Brady restructuring deals of the 1990s. While our algorithm picks up Bulgaria, Costa Rica, Jordan, Nigeria, and Vietnam, larger countries such as Brazil, Mexico and Poland do not show up in the debt reversal category. The reasons for this apparent puzzle are examined below.

***The missing Brady Bunch: an episode of fast releveraging***

Table 15 traces the evolution of external debt in the 17 countries whose external obligations were restructured under the umbrella of the Brady deals pioneered by Mexico and Costa Rica in the late 1980s.<sup>31</sup> The first two columns list the country and the year of the Brady deal, while the next two columns provide information on the external debt-to-GNP ratio and the stock of external debt in US dollars the year prior to the restructuring (t-1). The coverage of the plan and the size of the debt reduction follow in the next two columns. As in Table 14, we also provide information on the debt-to-GNP ratio and the

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<sup>31</sup> For details on the Brady debt restructurings of the 1990s, see Cline (1995), and IMF (1995). For a survey of the debate prior to the Brady plans see Williamson (1988).

total external debt three years after the deal (t+3) in the next two columns. The last two columns show the values of those two indicators in the year 2000.

**Table 15. The Missing Brady Bunch**

Country, Year of Brady deal	Year t-1		Debt covered by Brady deal (billions US\$)	Size of debt reduction (billions US\$)	Year t +3		Latest <sup>a</sup>	
	Debt/GNP (percent)	Total External Debt (billions US\$)			Debt/GNP (percent)	Total External Debt (billions US\$)	Debt/GDP (percent)	Total External Debt (billions US\$)
Mexico, 1989	56.4	99.2	48.23	6.80	31.7	112.3	26.8	150.3
Costa Rica, 1989	105.9	4.5	1.46	0.99	47.1	3.9	30.5	4.5
Venezuela, 1990	77.5	32.4	19.70	1.92	64.4	37.5	32.0	38.2
Nigeria, 1991	130.7	33.4	5.81	3.39	155.3	33.1	92.9	34.1
Uruguay, 1991	49.3	4.4	1.61	0.63	31.6	5.1	<b>42.3</b>	<b>8.2</b>
Argentina, 1992	35.6	65.4	19.40	2.36	39.0	98.8	<b>52.6</b>	<b>146.2</b>
Brazil, 1992	30.4	121.0	40.60	4.97	23.2	160.5	<b>41.8</b>	<b>238.0</b>
Philippines, 1992	71.1	32.5	4.47	1.26	49.7	37.8	<b>63.1</b>	<b>50.1</b>
Bulgaria, 1993	116.0	11.8	6.19	2.66	105.7	10.0	85.9	10.0
Dominican Republic, 1993	54.7	4.6	0.78	0.45	34.4	4.3	24.7	4.6
Jordan, 1993	155.8	7.8	0.74	0.08	119.4	8.0	99.0	8.2
Ecuador, 1994	104.4	14.1	4.52	1.18	81.8	15.4	<b>107.3</b>	<b>13.3</b>
Poland, 1994	53.3	45.2	9.99	4.85	28.3	40.4	<b>40.5</b>	<b>63.6</b>
Panama, 1996	80.9	6.1	3.77	0.96	77.5	6.8	75.3	7.1
Peru, 1997	53.3	29.0	8.50	3.90	55.0	28.6	55.0	28.6
Côte d'Ivoire, 1998 <sup>b</sup>	158.1	15.6	6.90	4.40	140.9	12.1	140.9	12.1
Vietnam, 1998 <sup>b</sup>	78.9	21.8	0.92	0.41	40.8	12.8	40.8	12.8

<sup>a</sup> Estimates for end-2000.

<sup>b</sup> Estimates for year t+3 are those for year 2000 (year t+2.)

Source: IMF (1995), and IMF estimates.

Table 15 makes it clear why our debt reversal algorithm did not pick up 12 of the 17 Brady deals. In 10 of those 12 cases, the decline in the external debt-to-GNP ratio produced by the Brady restructurings was smaller than 25 percentage points. In fact, the debt-to-GNP ratio in Argentina and Peru three years after the Brady deal was higher than what it had been in the year prior to the restructuring! Moreover, by the year 2000, 7 of the 17 countries that had undertaken a Brady-type restructuring had ratios of external debt-to-GNP that were higher than those at t+3 (Argentina, Brazil, Ecuador, Peru, Philippines, Poland, and Uruguay), and four of those countries (Argentina, Brazil, Ecuador, and Peru) had by the end of 2000 debt ratios that were higher than those

recorded prior to the Brady deal. By 2002, three members of the Brady bunch had once again defaulted on their external debt (Argentina, Côte D'Ivoire, and Ecuador), and a few others were teetering on the brink.

The analysis of this section makes it apparent that when assessing debt restructuring programs for highly debt intolerant countries it is critical to ask whether measures can be taken to reduce the likelihood of a near-term repeat problem.

#### **V. DOMESTIC DEBT, DOLLARIZATION, AND LIBERALIZATION**

Up to this point, our discussion and analysis of debt intolerance has focused on a country's total external debt. The reasons for this are twofold. First, until recently, the theoretical literature of public debt in emerging market countries had focused primarily on external debt rather than on total government debt. This common practice was grounded on the observation that the majority of emerging market country governments had little scope for financing their fiscal deficits by resorting to the domestic placement of marketable debt. Second, a key point of our empirical analysis has been to show that the external debt burdens countries are able, *and have been able*, to tolerate are systematically related to their own credit and inflation histories. We have investigated this proposition using time series for the countries' level of external indebtedness dating back to the 1970s. Unfortunately, there is not a sufficient past record to allow us to conduct a comparable empirical analysis of domestic government debt.

That being said, domestically-issued market-based government debt has become increasingly important for emerging market country governments, both as a source of financing and as a trigger for generalized debt and financial crises. Domestically-issued foreign currency debt was at the center of the Mexican crisis of December 1994 (the infamous "Tesobonos"). Domestically-issued government debt contributed to the costly

collapse of the convertibility regime in Argentina in late 2001 and to the current predicament of tiny Uruguay. Domestically-issued government debt accounts presently for the lion's share of public debt in Brazil and Turkey, and will ultimately determine the fate of those countries efforts at financial stabilization.

Recognizing this fact, in this section we discuss some conceptual issues related to the role of domestic government debt in emerging market countries, document and explain related manifestations of debt intolerance—such as domestic dollarization—and offer some explanations for the rapid growth of domestic government debt in recent years. The growth of domestic government debt turns out to be a widespread phenomenon in middle income emerging economies. We conjecture that going forward, the same historic factors that explain external debt intolerance will extend to domestic debt intolerance, as will the conclusions we have drawn about how rare it is for countries to grow their way out of high levels of indebtedness.

There is no easy way to aggregate domestically-issued and externally-issued government debt for the purpose of assessing vulnerabilities or the likelihood of a debt crises, and there are differing views.<sup>32</sup> To be sure, the view that external debt is completely separable from domestically issued debt is dead wrong. As a by-product of capital mobility and financial integration, foreigners hold increasingly large amounts of domestically-issued debt of emerging market country governments, and emerging market residents increasingly hold instruments issued by advanced country governments. Financial integration and open capital accounts encourage active arbitrage across the two markets. In this type of setting, a default on domestic government debt can easily trigger

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<sup>32</sup> IMF (2002), for example, proposes to undertake *parallel* assessments of external and public (domestic and external) debt sustainability.

a default on foreign debt, first for reputation reasons, and second because induced output and exchange rate effects can easily affect a country's prospects for servicing foreign debts, not least through the havoc domestic default wreaks on the banking system.

That said, it is also clearly wrong to assume that domestically issued and foreign-issued debt are perfect substitutes. First, foreigners typically do hold a large share of externally-issued debt, whereas domestic residents typically hold most domestically-issued debt. Second, the risks of cutoff to international trade credits, to future international borrowing, etc., are undeniably larger in the case of default on foreign-issued debt. Thus, the default calculus simply cannot be the same, and the two classes of debt instruments will not, in general, be equivalent. (The fundamental distinction is clearly reflected in the fact that, at times, rating agencies grade the sovereign foreign-issued debt of a country significantly higher than its domestically-issued debt.)

Given the lack of theoretical clarity on the distinction between foreign-issued and domestically-issued government debt, our objective in this section is to present some basic facts and explore whether the symptoms of debt intolerance seem broadly similar for both instruments; we leave it to future research to delineate more clearly the dividing lines between domestic and external debt in a global economy.

### ***The growth of domestic government debt: New data***

Figure 3 illustrates the rapid growth of marketable domestic government debt in emerging economies in the late 1990s.<sup>33</sup> The white bars represent the US dollar equivalent of total government debt while the dark portion of the bars represent the

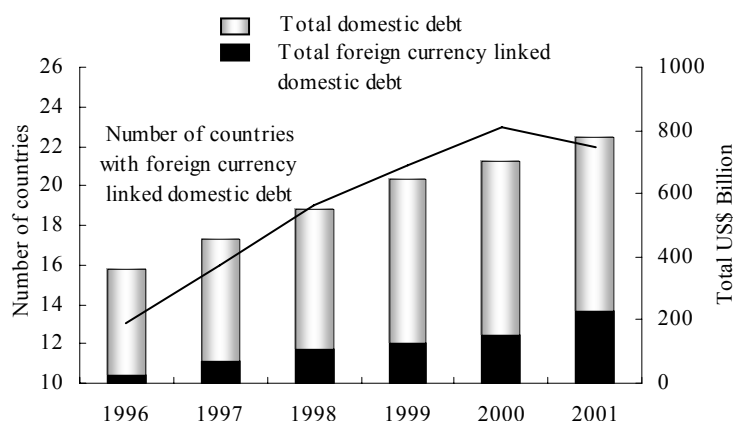
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<sup>33</sup> The 23 countries used to construct this figure are: Kazakhstan, Mexico, Ukraine, Indonesia, Pakistan, Costa Rica, Russia, Bulgaria, Paraguay, El Salvador, Ecuador, Chile, Peru, Bolivia, Egypt, Romania, Lebanon, Turkey, Uruguay, Argentina, Belarus, Brazil, Colombia, and Guatemala.



amount of domestic government debt that is dollar linked. The solid line indicates the number of countries in the sample that relied on debt instruments with some type of dollar indexation. By end-2001, the stock of domestic government debt of the 23 countries in Figure 3 amounted to approximately US \$800 billion. More than 25 percent of that stock consisted of debt linked to a foreign currency, and the bulk of the rest was often indexed to some other market variable (for example, as of end-2002, about 45 percent of Brazil's domestic government debt was linked to the overnight interest rate). The fraction of domestic government debt that is not indexed to a market variable is typically of very short maturity. Indeed, long term bond financing on non-indexed domestic currency instruments remains as elusive for the majority of emerging market economies today as it was two or three decades ago.

Figure 3. Emerging Market Countries: Domestic Government Debt, 1996-2001



Source: IMF staff estimates.

Notes: Domestic debt denominated in local currency is converted into U.S. dollars at the end of period exchange rate.

The above trends suggest that domestic debt intolerance can manifest itself in a manner similar to external debt intolerance. Indeed, as we will later show for

dollarization, many of the variables typically linked to the vulnerability of a country's debt position (e.g., maturity structure, indexation, etc.) are manifestations of debt intolerance and may be viewed as linked to a common set of factors.

The surge in domestic government debt is also apparent in the emerging market countries that formed the core sample of our analysis of external debt intolerance. Table 16 shows that the stock of domestic government debt in this group of countries has increased markedly over the last two decades. The rise has been particularly large in the Asian countries—both in those with no default history, and in the Philippines. But domestic government debt has also risen significantly in a number of Latin American countries, as well as in Turkey.

In all Asian countries except India, the build-up of domestic government debt was propelled by the recapitalization of the domestic financial systems that governments engineered in the aftermath of the 1997-98 crises. Financial system bailouts also contributed to the rise of domestic government debt in Mexico and Turkey. In the rest of the cases, including India, the buildup of domestic public debt has been primarily a reflection of fiscal profligacy. More precisely, as we will show later, (their inability (or unwillingness) to offset the revenue losses stemming from trade and financial reform, and from disinflation, with new taxes or lower spending sets them up for a fall.

Regardless of its origins, and notwithstanding the positive effects that government debt may have for local financial markets, the rise of domestic public debt in many emerging markets arguably overshadows the progress that many countries have made in containing their external debt burden, raising complex questions about their ability to overcome longstanding debt intolerance. Barring a relatively rapid overhaul of their tax

**Table 16. Total Government Debt in Emerging Markets: the 1980s and the 1990s**

	Early 1980s <sup>a</sup>			Late 1990s <sup>b</sup>		
	<i>Domestic debt</i> <sup>c</sup>	<i>External debt</i> <sup>d</sup>	<i>Total government debt</i>	<i>Domestic debt</i> <sup>c</sup>	<i>External debt</i> <sup>d</sup>	<i>Total government debt</i>
<i>Countries with at least one external default or restructuring since 1824</i>						
Argentina	13.2	38.4	51.6	15.4	36.4	51.8
Brazil	15.9	31.4	47.3	35.8	18.5	54.3
Chile	10.8	45.9	56.7	27.3	8.8	36.1
Colombia	4.4	25.8	30.2	12.4	24.5	36.9
Mexico	2.3	37.7	40.0	9.5	26.8	36.3
Philippines	13.6	60.3	73.9	43.0	48.8	91.8
Turkey	12.9	28.8	41.7	24.4	36.5	60.9
Venezuela	11.6	38.5	50.1	7.4	32.6	40.0
<i>average</i>	<i>10.6</i>	<i>38.4</i>	<i>48.9</i>	<i>21.9</i>	<i>29.1</i>	<i>51.0</i>
<i>Countries with no history of external default</i>						
India	7.1	12.3	19.4	64.9	20.6	85.5
Korea	9.4	41.9	51.3	41.6	21.1	62.7
Malaysia	20.8	39.0	59.8	35.1	30.7	65.8
Thailand	6.1	25.2	31.3	34.6	41.5	76.1
<i>average</i>	<i>10.9</i>	<i>29.6</i>	<i>40.5</i>	<i>44.1</i>	<i>28.5</i>	<i>72.5</i>

<sup>a</sup> Average for 1980-85, except for domestic debt to GDP ratios in Argentina (1981-1986), Brazil (1981-1985),

Mexico (1982-1985) and Turkey (1981-1986.)

<sup>b</sup> Average for 1996-2000, except for domestic debt to GDP ratio in Korea (1997-2000).

<sup>c</sup> Domestic government debt as a share of GDP. General government for the early 1980s in all countries except

Brazil, Chile, Colombia and Mexico. Non-financial public sector for the late 1990s.

<sup>d</sup> External debt of the non-financial public sector as a share of GDP.

Sources: Government Finance Statistics, World Bank debt tables, World Economic Outlook, IMF estimates and national sources.

and legal systems and/or substantive efforts to reduce their levels of spending, it seems unreasonable to expect that the governments of all these countries will refrain from doing to their domestically-issued debts what so many of them in the past have done so often to their external obligations. Indeed, Table 16 suggests that a wave of restructurings or

outright default on domestic government debts looms large on the horizon for many emerging market economies in the early part of the 21<sup>st</sup> century.

***Another manifestation of debt intolerance: Domestic dollarization***

The external debt of emerging market countries is, almost without exception, denominated in a foreign currency. As discussed in the preceding section, however, governments in many emerging markets today also issue domestic debt linked to a foreign currency. Even more countries, including many that have experienced very high or chronic inflation, have highly dollarized banking systems. Table 17 provides a few summary indicators of the degree of domestic dollarization in the emerging market countries of our core sample for the period 1996-2001. The second and third columns show, respectively, the degree of dollarization in the banking sector, as measured by the share of foreign currency deposits in broad money, and the share of domestic government debt in foreign currency as a percent of total domestic government debt. The last column shows a composite dollarization index that takes on values ranging from zero, when there is no domestic dollarization of any form to a maximum value of 20 when the domestic financial system is highly dollarized.<sup>34</sup>

While there is considerable variation in the degree of domestic dollarization within the countries with a default history, with Argentina (very high) and Colombia (very low) at polar extremes, it is evident that, on the whole, countries with a patchier credit history have a higher degree of domestic dollarization by any of these measures. Thus, for example, according to the composite index, countries with a history of external debt default are about four times more dollarized than the others. This likely owes to the

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<sup>34</sup> See Reinhart, Rogoff, and Savastano (2003) for details on the construction of this dollarization index.

**Table 17. Varieties of Domestic Dollarization: Period averages, 1996-2001**

	<i>Ratio of Foreign Currency Deposits Broad Money</i>	<i>Share of Domestic Debt Denominated in Foreign Currency</i>	<i>Composite Domestic Dollarization Index</i>
<i>Countries with at least one default or restructuring since 1824</i>			
Argentina	52.5	81.8	15
Brazil	0.0	19.9	2
Chile	8.3	8.4	2
Colombia	0.0	6.7	1
Egypt	26.0	5.7	4
Mexico	5.5	0.0	2
Philippines	27.6	0.0	3
Turkey	45.9	21.9	8
Venezuela	0.1	0.0	1
<i>Group average</i>	<i>18.4</i>	<i>16.0</i>	<i>4.2</i>
<i>Developing countries with no default history</i>			
India	0.0	0.0	0
Korea	0.0	0.0	0
Malaysia	1.8	1.7	1
Singapore	0.0	0.0	0
Thailand	0.8	0.0	0
<i>Group average</i>	<i>0.5</i>	<i>0.3</i>	<i>0.2</i>

Sources: Reinhart, Rogoff, and Savastano (2003) and sources cited therein.

fact that, by and large, debt intolerant countries tend to have history of high (and often times chronic) inflation.

Table 18 presents the results of cross-country regressions using the domestic dollarization index shown in Table 17 as a dependent variable. The regressors are the same as those used in Section III to explain the Institutional Investor rating (our preferred measure of country risk) namely: countries' credit and inflation histories and countries' debt-to-output ratios.

Considering that dollarization is a form of indexation, it is not surprising that the inflation history is the most important variable in explaining domestic dollarization.

External debt-to-GNP is also significant with a positive coefficient. While the

interpretation of the role of external debt is less obvious, one could reasonably conjecture that when the external debt burden is high, governments were more likely to resort to inflationary financing of their fiscal imbalances and, in the process, truncate the development of a market for nominal government debt in domestic currency.<sup>35</sup>

**Table 18. Explaining Partial Domestic Dollarization: The Role of History**

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The regression is:  $Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i$ , where the  $X$ s are defined below, the subscript  $i$  denotes the country, and  $u_i$  is a disturbance term.

$X_1$  = Percent of 12-month periods of inflation at or above 40 percent since 1948.  
 $X_2$  = Percent of years in a state of default or restructuring since 1824.  
 $X_3$  = External debt/GNP (1970-2000 average)  
 $Y$  = Composite domestic dollarization index (1996-2001 average)

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$X_1$	$X_2$	$X_3$	<i>Number of observations</i>	<i>Adjusted R<sup>2</sup></i>
0.08 (2.67)	0.05 (1.67)	0.04 (2.00)	62	0.31

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Notes:  $t$ -statistics in parentheses.

Sources: Beim and Calomiris (2001), *Institutional Investor*, *International Monetary Fund*, *International Financial Statistics*, Standard and Poor's *Credit Week* and *Debt Cycles in the World Economy* (1992), Reinhart, Rogoff, and Savastano (2003), and authors' calculations.

### ***Liberalization, stabilization, and its consequences for debt***

Many factors contributed to the alarming rise in domestic government debt illustrated in Table 16. Key among these have been the wide-ranging processes of liberalization undertaken by emerging markets since the late 1980s. The last column of Table 19 shows that trade liberalization typically entailed revenue losses for the emerging markets in our core sample. A similar pattern is discernible in Figure 4. The left-hand-side panel plots the three-year moving average of trade taxes as a percent of GDP in four countries of that core sample from the early 1980s to 2001. The figures show a steady

<sup>35</sup> Indeed, this has been the case in many of the highly dollarized economies.

decline in the share of trade tax revenues in those countries during that period. In some cases this loss in revenues was offset by higher revenues from other sources (such as value added taxes). However, the estimates in Table 19 show that, for the group as a whole, total tax revenues as a share of GDP also experienced a cumulative decline over the last two decades.

**Table 19. The Dark Side of Disinflation and Liberalization  
(Average changes for the group as a percent of GDP)**

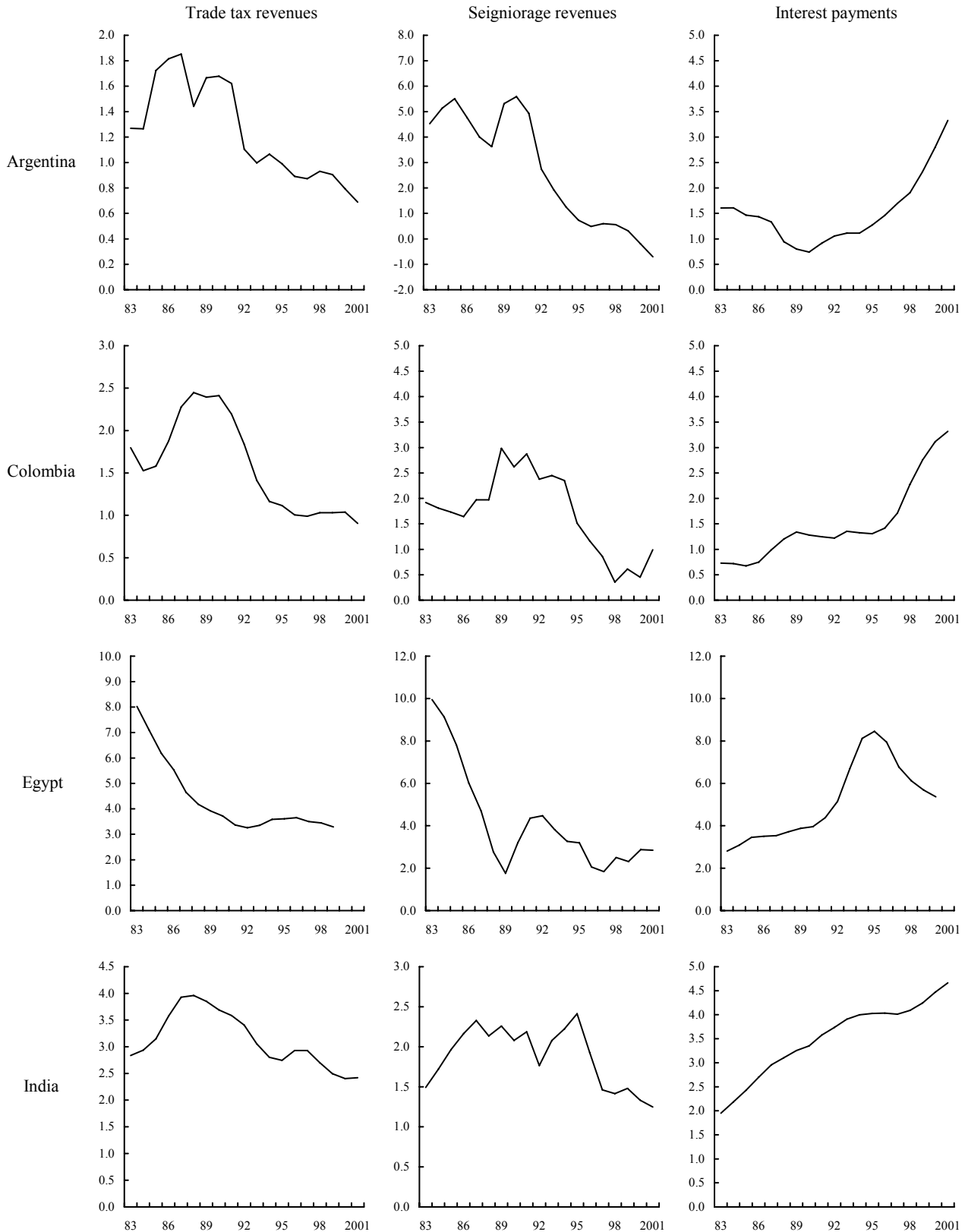
	<i>Change from 1980-85 to 1986-1990</i>	<i>Change from 1986-90 to 1991-1995</i>	<i>Change from 1990-95 to 1996-2000</i>	<i>Cumulative change from 1980-85 to 1996-2000</i>
<i>Countries with at least one default or restructuring since 1824<sup>a</sup></i>				
Central government expenditures	-1.0	-0.7	0.4	-1.3
Interest payments	3.4	-1.1	-0.5	1.8
Central government revenues	-2.9	1.7	0.0	-1.2
Tax revenues	-2.0	1.0	0.5	-0.5
Trade taxes	-0.3	-0.2	-0.4	-0.9
Central government deficit	2.4	-2.3	0.5	0.6
Seigniorage revenues	-0.8	-0.3	-1.2	-2.3
<i>Countries with no history of default<sup>b</sup></i>				
Central government expenditures	-1.2	-2.7	0.5	-3.4
Interest payments	0.8	-1.2	-0.6	-1.0
Central government revenues	0.7	0.5	0.5	1.7
Tax revenues	-1.2	0.8	-0.7	-1.1
Trade taxes	-0.5	-0.6	-0.5	-1.6
Central government deficit	-1.8	-3.2	0.0	-5.0
Seigniorage revenues	0.5	0.3	-0.8	0.0

<sup>a</sup> Argentina, Brazil, Chile, Colombia, Egypt, Mexico, Philippines, Turkey, and Venezuela.

<sup>b</sup> India, Korea, Malaysia, Singapore, and Thailand.

Source: Appendix Table A.3.

Figure 4. Vanishing Taxes and Rising Debt Servicing Costs  
(Percent of GDP, three-year moving average)



Sources: International Monetary Fund, *International Financial Statistics* and *Government Finance Statistics*.



Declining trade taxes were not the only source of erosion of the standard fare of revenue sources in emerging market countries. In the wake of financial liberalization, the revenue from financial repression also vanished, as shown in Table 20. Interest-rate ceilings were lifted and bank loans to the government at subsidized interest rates gave way to market-based high interest rate domestic public debt. As presciently noted by McKinnon in the early 1990s (see endnote 5), in many cases the outcome was a significant increase in domestic interest outlays by the government, a trend that is clearly captured in the right-hand-side panels of Figure 4 and in Table 19 (for the countries with a history of default). Simply put, much of the debt governments had crammed down on financial intermediaries at sub-market interest rates, suddenly became part of those governments' market debt burden. Debt intolerance symptoms rose accordingly.

In addition to the aforementioned revenue losses and higher debt servicing costs, many of the emerging market countries of our core sample—particularly the group with a default history—had traditionally relied on revenues from seigniorage to finance a non-trivial fraction of their fiscal deficits. As those countries became successful in reducing inflation to historically low levels, revenues from seigniorage became much less important. As shown in Table 19, the cumulative decline was over two percent of GDP, and for some countries (such as Argentina and Egypt) the decline was even larger. All in all, for those governments that did not manage to bring expenditure in line with the new realities, the outcome of liberalization and inflation stabilization has turned out to be a heavier reliance on domestic and/or foreign debt financing.

**Table 20. Revenues from Financial Repression: Early-1980s and late-1990s (in percent of GDP)**

	<i>Early 1980s</i> <sup>a</sup>			<i>Late 1990s</i> <sup>b</sup>	
	<i>Measure 1</i>	<i>Measure 2</i>	<i>Measure 3</i>	<i>Measure 2</i>	<i>Measure</i>
<i>Countries with at least one external default or restructuring since 1824</i>					
Argentina	n.a.	0.0	2.1	-0.6	-1.6
Brazil	0.5	n.a.	n.a.	-4.5	-3.6
Chile	n.a.	0.4	-1.6	-1.7	-1.7
Colombia	0.3	-0.3	-0.2	-0.6	-0.7
Mexico	5.8	2.0	1.5	-0.4	-0.2
Philippines	0.8	n.a.	n.a.	-2.7	-0.8
Turkey	2.7	n.a.	n.a.	0.4	0.5
<i>Countries with no history of external default</i>					
Thailand	0.8	-0.6	-2.5	-1.4	-2.1
India	2.9	n.a.	n.a.	-0.6	-0.5
Korea	0.6	n.a.	n.a.	-1.9	-2.1
Malaysia	1.0	n.a.	n.a.	-0.7	-2.3

<sup>a</sup> Average for 1980-1985, except for Measure 1 estimates for Brazil (1983-1987), Malaysia (1979-1981) and Mexico (1984-1987.)

<sup>b</sup> Average for 1996-2000; except for Korea, Thailand, and Malaysia—all averages for 1997-2000.

Notes: An n.a. stands for not available.

Measure 1: Estimates from Giovannini and de Melo (1993). Tax revenues calculated as the difference between the foreign and the domestic effective interest rate multiplied by the ratio of government domestic debt to GDP.

Measure 2: Estimates from Easterly (1989). Tax revenues calculated as the negative of the domestic real interest rate multiplied by the ratio of government domestic debt in domestic currency to GDP.

Measure 3: Estimates from Easterly and Schmidt-Hebbel (1994). Tax revenues calculated as the difference between the OECD average real interest rate and the domestic real interest rate multiplied by the ratio of bank deposits in domestic currency to GDP.

## VI. REFLECTIONS ON POLICIES FOR DEBT INTOLERANT COUNTRIES

The sad fact related in our work is that once a country slips into being a serial defaulter, it retains a high level debt intolerance that is difficult to shed. Countries can and do graduate, but the process is seldom fast nor easy. Absent the pull of an outside political anchor (e.g., European Union or, one hopes, NAFTA for Mexico), recovery may take decades or even centuries. The implications are certainly sobering for sustainability

exercises that ignore debt intolerance, and even for debt restructuring plans that pretend to cure the problem permanently simply through a one-time reduction in the face value of a country's debt.

How serious are the consequences of debt intolerance? Is a country with weak internal structures that makes it intolerant to debt doomed to follow a trajectory of lower growth and higher macroeconomic volatility? At some level, the answer has to be yes, but constrained access to international capital markets is best viewed as a symptom, not a cause, of the disease.

Rather, the institutional failings that make a country intolerant to debt pose the real impediment. The basic problem is threefold. First, the modern empirical growth literature increasingly points to “soft” factors such as institutions, corruption and governance, as far more important than differences in capital/labor ratios in explaining cross-country differences in per capita incomes. Simply equalizing marginal products of physical capital across countries (the sine non quo of capital market integration in deterministic world) only goes a limited ways to equalizing marginal labor products.<sup>36</sup> Second, quantitative methods have similarly suggested that the risk-sharing benefits to capital market integration (that is, in terms of lowering consumption volatility as opposed to raising consumption growth) may also be relatively modest. And these results pertain to an idealized world where one does not have to worry about gratuitous policy-induced macroeconomic instability, poor domestic bank regulation, corruption, and (not the least)

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<sup>36</sup> For a broader discussion, see the IMF's World Economic Outlook, April 2003, Chapter 3.

policies that distort capital inflows towards short term debt.<sup>37</sup> Third, there is evidence to suggest that capital flows to emerging markets are markedly procyclical and that this may make macroeconomic policies in these countries procyclical as well (for instance, tightening fiscal policy and raising interest rates when there are outflows.)<sup>38</sup> Arguably, having limited, but stable, access to capital markets may be welfare improving relative to the boom-bust pattern we so often observe. So the deeply entrenched idea that an emerging market economy's growth trajectory will be hampered by limited access to debt markets is no longer as compelling as was once thought.<sup>39</sup>

The aforementioned academic literature does not actually paint sharp distinctions between different types of capital flows (debt/equity/FDI, long-term versus short debt, etc.). Practical policymakers, of course, are justifiably quite concerned with the exact form that cross-border flows take, with foreign direct investment generally thought to have preferable properties to debt. (FDI is less volatile, it is often associated with technology transfer, etc.)<sup>40</sup> We generally share the view that FDI and equity investment is somewhat less problematic than debt, but one wants to avoid overstating the case. In

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<sup>37</sup> Prasad, Rogoff, Wei and Kose (2003) find that during the 1990s, economies that were de facto relatively financially open experienced, on average, a rise in consumption volatility relative to output volatility, contrary to the premise the capital market integration spreads country-specific output risk. Prasad et. al. also argue that the cross-country empirical evidence on the effects of capital market integration on growth shows only weak positive effects at best, and arguably none.

<sup>38</sup> See Kaminsky, Reinhart, and Végh (2003) on this issue.

<sup>39</sup> For an extensive survey of empirical evidence on the growth effects of capital market integration, see Prasad, Rogoff, Wei and Kose (2003).

<sup>40</sup> Of course, it was not always so. Prior to the 1980s, many governments viewed allowing FDI as equivalent to mortgaging off their futures, and hence borrowing and full ownership was preferred. And of course, where FDI was more dominant (e.g., oil and natural resources investment in the 1950s and 1960s), pressure for nationalization increases, so FDI should not be regarded as a panacea for poor growth performance.

practice, the three types of capital inflows are often interlinked (e.g., foreign firms will often bring cash into a country in advance of actually making plant acquisitions). Moreover, derivative contracts often blur the three categories, and it can be difficult for even the most diligent statistical authorities to separate different types of foreign capital inflows accurately (not to mention the fact that when in doubt, some countries will prefer to label a particular investment as FDI to make vulnerabilities seem lower.) Given these qualifications, however, we still believe the advanced country governments can do more to discourage excessive dependence on risky non-indexed debt relative to other forms of capital flows (Rogoff, 1999, and Bulow and Rogoff, 1990, argue that the creditor country legal systems should be amended so they no longer tilt capital flows towards debt).

Lastly, it should be noted that short-term debt – typically identified as the most problematic in terms of precipitating debt crises – helps facilitate trade in goods and is necessary in some measure to allow private agents to execute hedging strategies. Of course, one would imagine that most of the essential benefits to having access to capital markets could be enjoyed with relatively modest debt-to-GNP ratios.

All in all, debt intolerance need not be fatal to growth and macroeconomic stability. However, the evidence presented here suggests that to overcome debt intolerance, policymakers need to be prepared to keep debt levels low for extended periods of time while undertaking more basic structural reforms to insure that the country can eventually digest higher debt burdens without experiencing intolerance. This applies not only to external debt but also to the very modern and growing problem of domestic government debt. Policymakers who face tremendous short-term pressures will still choose to engage in high-risk borrowing, and for the right price markets will let them.

But understanding the basic problem should at least guide a country's citizens, not to mention international lending institutions and the broader international community, in their own decisions.

In our view, developing a better understanding of the problem of serial default on external debt obligations is essential to designing better domestic and international economic policies towards crisis prevention and resolution. "Debt intolerance" can be captured systematically by a relatively small number of variables, principally a country's own history of default and high inflation. Debt intolerant countries face surprisingly low thresholds for external borrowing, beyond which risks of default or restructuring become significant. With the recent explosion of domestic borrowing, on which we have presented new data in this paper, these thresholds for external debt are now clearly even lower, though it remains an open question to what extent domestic and external debt can be aggregated. This question urgently needs to be addressed, in part because many questions involving bailouts by the international community surround it. Our initial results suggest that the same factors that determine external debt intolerance (not to mention other manifestations of debt intolerance like domestic dollarization) are also likely to impinge heavily on domestic debt intolerance. Lastly, we show that whereas debt intolerant countries need badly to find ways to bring debt/GNP ratios to safer ground, doing so is not easy. Historically, the cases where countries escape high external debt/GNP ratios either via rapid growth or sizable and prolonged repayments, are very much the exception. Most large reductions in external debt among emerging markets have been achieved via restructuring or default. Going forward, a challenge will be how

to find ways to channel capital to debt intolerant countries in non-debt form, to prevent the cycle from repeating itself for another century to come.

## Debt Glossary

*External Debt:* total liabilities of a country with foreign creditors, both official (public) and private. Creditors often determine all the terms of the debt contracts, which are normally subject to the jurisdiction of the foreign creditors or to international law (for multilateral credits).

*Total government debt (total public debt):* total debt liabilities of a government with both domestic and foreign creditors. The “government” normally comprises the central administration, provincial governments, federal governments and all other entities that borrow with an explicit government guarantee.

*Government domestic debt:* all debt liabilities of a government that are issued under--and subject to--national jurisdiction, regardless of the nationality of the creditor. Terms of the debt contracts can be market determined or set unilaterally by the government.

*Government foreign currency domestic debt:* debt liabilities of a government issued under national jurisdiction that are nonetheless expressed in (or linked to) a currency different from the national currency of the country.



## **Data Appendix**

### *Sample*

To illustrate the extent to which modern-day debt intolerance arises from countries' own external credit histories (due to serial correlation in characteristics as well as reputational factors), we use throughout the paper a core sample comprising three groups of countries: emerging market countries with a history of default or restructuring of external debt, emerging market countries without a history of default, and advanced economies (which mostly have no history of default, except during war as, for instance, Japan and Italy during World War II.) Included in the first group are countries with a history of default or restructuring that involved concessionary terms: Argentina, Brazil, Chile, Colombia, Egypt, Mexico, the Philippines, Turkey, and Venezuela. The other two groups consist of countries that do not have a history of external debt defaults or restructuring, but we distinguish developing from advanced economies. The rationale for the distinction is that emerging market economies with an unblemished credit record belong to a "debtor club" different from that of their more advanced counterparts. The core emerging market economies with no history of default include: India, Korea, Malaysia, Singapore, and Thailand. The core sample of advanced countries includes Australia, Canada, Italy, New Zealand, Norway, and the United States.

*Data sources*

<i>Series</i>	<i>Description and sources</i>	<i>Sample period</i>
Institutional Investor's Country Credit Ratings	Institutional Investor, various issues.	1979-2002
Secondary market prices of debt	Salomon Brothers, Inc., ANZ Bank <i>Secondary Market Price Report.</i>	1986-1992
EMBI spread	JP Morgan Chase,	1992-2002
External debt/GNP	World Bank, <i>Global Development Finance</i>	1970-2000
External debt/exports	World Bank, <i>Global Development Finance</i>	1970-2000
Interest payments	World Bank, <i>Global Development Finance</i>	1970-2000
General government debt/GNP (OECD countries)	OECD	1970-2002
General government debt/exports (OECD countries)	OECD	1970-2002
Domestic government debt	International Monetary Fund, <i>Government Fiscal Statistics</i> ; IMF Staff estimates.	1980-1986 1996-2001
Probability of inflation above 40 percent	International Monetary Fund, <i>International Financial Statistics</i> and Reinhart and Rogoff (2002).	1958-2001
Probability of being in a state of default or restructuring	Beim and Calomiris (2001), Standard and Poor's <i>Credit Week</i> and <i>Debt Cycles in the World Economy</i> (1992), Reinhart (2002) and authors' calculations.	1824-1999
Domestic dollarization index	Reinhart, Rogoff, and Savastano (2003).	1980-2001 (for part of the sample 1996-2001)
Ratio of Foreign Currency Deposits to broad money	International Monetary Fund, <i>International Financial Statistics</i> and various central banks.	1980-2001 (for part of the sample 1996-2001)
Share of Domestic Debt Denominated in a Foreign Currency	IMF Staff estimates.	1996-2001
Central government expenditures/GDP	International Monetary Fund, <i>Government Fiscal Statistics</i>	1980-2000
Interest payments/GNP	World Bank, <i>Global Development Finance</i>	1970-2000
Central government revenues/GDP	International Monetary Fund, <i>Government Fiscal Statistics</i>	1980-2000
Tax revenues/GDP	International Monetary Fund, <i>Government Fiscal Statistics</i>	1980-2000
Trade taxes/GDP	International Monetary Fund, <i>Government Fiscal Statistics</i>	1980-2000
Seignorage/GNP	International Monetary Fund, <i>International Financial Statistics.</i>	1980-2000

**Appendix Table A1. Defining the Debtors' "Clubs" 1979-2002 Averages**

<i>Country</i>	<i>Average Institutional Investor Rating</i>	<i>Country</i>	<i>Average Institutional Investor Rating</i>
<i>Club A: Institutional Investor ratings 67.7 and above</i>			
United States	92.8	Finland	77.2
Japan	92.5	Denmark	76.9
Canada	86.0	Italy	76.4
Norway	84.3	Spain	73.8
Singapore	79.9	Ireland	71.4
Sweden	79.7	New Zealand	70.7
Australia	77.3		
<i>Club B: 67.7 &lt; Institutional Investor ratings &lt; 24.1</i>			
Hong Kong	68.0	Turkey	34.9
Malaysia	63.5	Philippines	34.7
South Korea	63.4	Argentina	34.7
Portugal	63.3	Morocco	34.6
Saudi Arabia	62.8	Jordan	34.0
Thailand	55.7	Egypt	33.7
Greece	54.5	Paraguay	32.7
Czech Republic	54.5	Panama	32.5
Hungary	50.5	Poland	32.2
Chile	47.5	Romania	31.4
India	46.5	Kenya	29.2
South Africa	46.8	Costa Rica	28.3
Indonesia	46.0	Sri Lanka	28.2
Mexico	45.8	Ecuador	27.7
Colombia	44.6	Nigeria	26.0
Israel	42.8	Peru	25.9
Venezuela	41.5	Pakistan	25.7
Algeria	39.2	Swaziland	25.4
Ghana	37.6	Zimbabwe	24.9
Brazil	37.4	Nepal	24.5
Uruguay	37.1	Turkey	34.9
Papua New Guinea	35.5	Philippines	34.7
<i>Club C: Institutional Investor ratings 24.1 and below</i>			
Dominican Republic	22.7		
Jamaica	21.5		
Bolivia	19.0		
El Salvador	18.0		
Mali	16.6		
Tanzania	14.7		
Ethiopia	11.5		

**Appendix Table A.2 Panel Regressions: Fixed Effects Pooled Least Squares  
(Emerging Market Countries Only, 1979-2000)**

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*Dependent Variable: Institutional Investor Rating*

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
Debt/GNP	-0.13	0.01	-9.93	0.00
1980	-1.59	1.78	-0.90	0.37
1981	-2.31	1.76	-1.31	0.19
1982	-5.17	1.77	-2.92	0.00
1983	-9.39	1.77	-5.32	0.00
1984	-12.60	1.77	-7.11	0.00
1985	-12.32	1.78	-6.91	0.00
1986	-11.91	1.79	-6.65	0.00
1987	-12.23	1.788	-6.84	0.00
1988	-12.74	1.78	-7.15	0.00
1989	-12.69	1.78	-7.12	0.00
1990	-13.17	1.77	-7.46	0.00
1991	-13.19	1.77	-7.47	0.00
1992	-13.48	1.74	-7.76	0.00
1993	-11.78	1.74	-6.79	0.00
1994	-9.97	1.72	-5.79	0.00
1995	-8.53	1.72	-4.97	0.00
1996	-7.85	1.71	-4.58	0.00
1997	-6.56	1.71	-3.83	0.00
1998	-5.94	1.72	-3.45	0.00
1999	-6.64	1.72	3.86	0.00
2000	-4.26	1.72	-2.48	0.01

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**Appendix Table A.2 Panel Regressions (continued). Fixed Effects Coefficients in Descending Order  
(Emerging Market Countries Only, 1979-2000)**

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Malaysia	79.18
Portugal	77.24
Korea	76.19
Saudi Arabia	72.04
Greece	70.81
Thailand	70.81
Czech Rep.	68.79
Hungary	65.91
Indonesia	64.78
Chile	63.11
Israel	60.18
Mexico	59.23
Colombia	58.48
India	57.89
Venezuela	57.67
South Africa	54.86
Poland	53.98
Morocco	52.42
Egypt	51.95
Jordan	56.38
Panama	51.82
Philippines	51.06
Brazil	50.26
Uruguay	50.17
Argentina	49.89
Turkey	48.47
Costa Rica	45.04
Ghana	48.45
Ecuador	48.15
Nigeria	47.56
Kenya	47.52
Paraguay	46.42
Sri Lanka	45.64
Peru	42.20
Romania	41.68
Pakistan	40.89
Zimbabwe	40.32

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**Appendix Table A.2 Panel Regressions (continued). Fixed Effects Pooled Least Squares  
(All Countries Only, 1979-2000)**

<i>Dependent Variable: Institutional Investor Rating</i>				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
Debt/GNP Club A	-0.00	0.03	0.20	0.85
Debt/GNP Non-Club A.	-0.10	0.01	-8.79	0.00
1980	-1.76	1.51	-1.17	0.24
1981	-3.10	1.49	-2.08	0.04
1982	-5.96	1.49	-3.99	0.00
1983	-10.10	1.48	-6.81	0.00
1984	-12.77	1.48	-8.64	0.00
1985	-12.60	1.48	-8.49	0.00
1986	-12.16	1.49	-8.16	0.00
1987	-12.59	1.49	-8.47	0.00
1988	-13.02	1.48	-8.77	0.00
1989	-12.91	1.48	-8.74	0.00
1990	-12.98	1.47	-8.83	0.00
1991	-13.08	1.47	-8.92	0.00
1992	-13.10	1.46	-9.00	0.00
1993	-11.60	1.46	-7.95	0.00
1994	-9.76	1.46	-6.71	0.00
1995	-8.47	1.45	-5.83	0.00
1996	-7.70	1.45	-5.31	0.00
1997	-6.41	1.44	-4.46	0.00
1998	-5.72	1.44	-3.96	0.00
1999	-5.92	1.44	-4.10	0.00
2000	-3.32	1.44	-2.30	0.02

**Appendix Table A.2 Panel Regressions (continued). Fixed Effects Coefficients in Descending Order  
(All Countries Only, 1979-2000)**

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Japan	101.70
United States	101.50
Canada	94.32
Norway	92.29
Singapore	90.87
Denmark	87.48
Finland	86.61
Italy	84.16
Australia	80.68
Ireland	79.56
Malaysia	77.74
Korea	75.31
Saudi Arabia	72.07
Portugal	70.16
Thailand	69.49
Czech Rep.	67.42
Hungary	64.11
Indonesia	62.98
Greece	61.32
Chile	61.18
Mexico	57.94
Colombia	57.44
India	57.29
Venezuela	56.17
South Africa	53.99
Jordan	53.15
Poland	52.26
Israel	50.26
Morocco	50.11
Egypt	49.50
Brazil	49.26
Philippines	49.15
Panama	49.11
Uruguay	48.97
Argentina	48.56
Turkey	47.36
Ecuador	45.61
Ghana	45.41
Kenya	45.49
Paraguay	45.37
Nigeria	44.78
Sri Lanka	43.78
Costa Rica	42.86
Romania	41.06
Peru	40.25
Pakistan	39.56
Zimbabwe	39.05
Jamaica	38.72
Tanzania	37.83
Bolivia	36.32
Dominican	34.12
El Salvador	28.61

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Appendix Table A3. Selected Fiscal Variables in Defaulters and Non-defaulters 1980-2000  
(all variables in percent of GDP)

	Change from 1980-85 to 1986-90	Change from 1986-90 to 1991-95	Change from 1990-95 to 1996-2000	Cumulative change from 1980-85 to 1996-2000
<b>A. Countries with a history of default</b>				
<b>Argentina</b>				
Central government expenditures	n.a.	n.a.	0.5	0.5
Interest payments	-0.5	0.3	1.2	1.1
Central government revenues	-0.2	3.1	6.7	9.7
Tax revenues	1.2	0.4	0.9	2.5
Trade taxes	0.4	-0.7	-0.1	-0.4
Central government deficit	n.a.	n.a.	-6.2	-6.2
Seigniorage revenues	-0.3	-3.4	-1.1	-4.7
<b>Brazil</b>				
Central government expenditures	9.7	-0.4	-6.6	2.7
Interest payments	12.7	-3.8	-8.5	0.4
Central government revenues	1.4	2.1	-4.0	-0.6
Tax revenues	-0.9	0.6	1.6	1.3
Trade taxes	-0.3	-0.1	0.2	-0.2
Central government deficit	8.3	-2.4	-2.6	3.3
Seigniorage revenues	4.1	1.0	-6.7	-1.6
<b>Chile</b>				
Central government expenditures	-7.5	-2.8	-0.1	-10.4
Interest payments	0.9	-0.6	-0.8	-0.6
Central government revenues	-6.3	-0.9	-1.3	-8.5
Tax revenues	-5.1	0.5	-1.2	-5.7
Trade taxes	0.3	-0.1	-0.5	-0.3
Central government deficit	-1.2	-2.0	1.2	-2.0
Seigniorage revenues	0.4	-0.1	-0.7	-0.3
<b>Colombia</b>				
Central government expenditures	n.a.	n.a.	4.3	4.3
Interest payments	0.6	0.1	1.2	1.9
Central government revenues	n.a.	n.a.	1.3	1.3
Tax revenues	1.7	1.8	-0.8	2.7
Trade taxes	0.6	-1.2	-0.3	-0.8
Central government deficit	n.a.	n.a.	3.0	3.0
Seigniorage revenues	0.5	-0.5	-1.3	-1.3
<b>Egypt</b>				
Central government expenditures	-10.3	1.4	-5.9	-14.8
Interest payments	0.6	3.6	-1.3	2.9
Central government revenues	-10.7	5.2	-8.2	-13.7
Tax revenues	-7.2	3.2	-0.8	-4.8
Trade taxes	-3.4	-0.4	0.0	-3.9
Central government deficit	0.4	-3.8	2.3	-1.1
Seigniorage revenues	-6.1	0.0	-0.9	-7.1
<b>Mexico</b>				
Central government expenditures	1.9	-9.5	-0.2	-7.7
Interest payments	7.9	-10.5	-0.8	-3.4
Central government revenues	0.4	-0.6	-1.5	-1.7
Tax revenues	0.1	-1.1	-0.6	-1.6
Trade taxes	0.0	0.2	-0.4	-0.2
Central government deficit	1.5	-8.9	1.3	-6.1
Seigniorage revenues	-3.8	-1.2	0.2	-4.7

Source: Authors' calculations based on data from the IMF's Government Finance Statistics and International Financial Statistics



Appendix Table A3. Selected Fiscal Variables in Defaulters and Non-defaulters 1980-2000  
(all variables in percent of GDP)

	Change from 1980-85 to 1986-90	Change from 1986-90 to 1991-95	Change from 1990-95 to 1996-2000	Cumulative change from 1980-85 to 1996-2000
A. Countries with a history of default (cont.)				
<b>Philippines</b>				
Central government expenditures	4.4	2.1	0.5	6.9
Interest payments	3.9	-0.3	-1.5	2.2
Central government revenues	2.7	3.4	-0.9	5.1
Tax revenues	1.5	3.2	0.0	4.7
Trade taxes	0.3	1.6	-1.5	0.4
Central government deficit	1.7	-1.3	1.4	1.8
Seigniorage revenues	-1.7	0.4	-0.3	-1.7
<b>Turkey</b>				
Central government expenditures	n.a.	5.1	10.9	15.9
Interest payments	n.a.	0.4	7.4	7.9
Central government revenues	n.a.	3.2	6.5	9.7
Tax revenues	n.a.	1.9	6.0	7.9
Trade taxes	n.a.	-0.2	-0.3	-0.5
Central government deficit	n.a.	1.9	4.3	6.3
Seigniorage revenues	0.4	-0.4	0.3	0.4
<b>Venezuela</b>				
Central government expenditures	-4.2	-1.1	0.6	-4.6
Interest payments	1.0	0.8	-1.1	0.7
Central government revenues	-7.8	-1.8	1.1	-8.5
Tax revenues	-7.4	-1.4	-0.4	-9.1
Trade taxes	-0.6	-0.8	-0.2	-1.6
Central government deficit	3.6	0.6	-0.5	3.8
Seigniorage revenues	-0.3	1.1	-0.2	0.5
B. Countries with no history of default				
<b>India</b>				
Central government expenditures	2.8	-1.4	-0.2	1.2
Interest payments	1.1	0.7	0.3	2.2
Central government revenues	1.1	-0.9	-0.5	-0.3
Tax revenues	0.6	-1.3	-0.5	-1.1
Trade taxes	0.9	-0.9	-0.4	-0.4
Central government deficit	1.7	-0.5	0.4	1.5
Seigniorage revenues	0.3	0.0	-0.8	-0.4
<b>Korea</b>				
Central government expenditures	-1.5	0.9	0.9	0.3
Interest payments	-0.3	-0.3	-0.1	-0.7
Central government revenues	-0.6	1.0	2.0	2.4
Tax revenues	-0.5	-0.1	0.7	0.0
Trade taxes	-0.2	-1.1	0.0	-1.3
Central government deficit	-0.9	-0.1	-1.1	-2.0
Seigniorage revenues	1.3	-0.4	-1.2	-0.3
<b>Malaysia</b>				
Central government expenditures	-6.8	-5.4	-2.8	-15.0
Interest payments	2.2	-2.6	-1.7	-2.1
Central government revenues	-2.3	0.3	-3.3	-5.2
Tax revenues	-4.0	1.7	-0.8	-3.1
Trade taxes	-2.4	-0.7	-0.9	-4.0
Central government deficit	-4.6	-5.7	0.5	-9.8
Seigniorage revenues	0.5	1.8	-0.8	1.6
<b>Singapore</b>				
Central government expenditures	2.6	-7.7	2.2	-2.9
Interest payments	0.6	-2.2	-1.2	-2.8
Central government revenues	3.1	0.4	6.3	9.8
Tax revenues	-3.6	2.1	-1.2	-2.8
Trade taxes	-0.7	-0.3	-0.1	-1.1
Central government deficit	-0.4	-8.2	-4.0	-12.7
Seigniorage revenues	0.0	-0.3	-1.0	-1.3
<b>Thailand</b>				
Central government expenditures	-3.0	0.2	2.4	-0.3
Interest payments	0.4	-1.7	-0.3	-1.6
Central government revenues	1.9	1.7	-1.9	1.7
Tax revenues	1.6	1.7	-1.5	1.7
Trade taxes	0.2	-0.3	-1.3	-1.4
Central government deficit	-4.9	-1.5	4.3	-2.1
Seigniorage revenues	0.5	0.1	-0.1	0.5

Source: Authors' calculations based on data from the IMF's Government Finance Statistics and International Financial Statistics

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