IMF Staff Papers
Vol. 56, No. 4

The Costs of Sovereign Default

EDUARDO BORENSZTEIN and UGO PANIZZA*

This paper empirically evaluates four types of costs that may result from an international sovereign default: reputational costs, international trade exclusion costs, costs to the domestic economy through the financial system, and political costs to the authorities. It finds that the economic costs are generally significant but short-lived, and sometimes do not operate through conventional channels. The political consequences of a debt crisis, by contrast, seem to be particularly dire for incumbent governments and finance ministers, broadly in line with what happens in currency crises. [JEL F34, F36, H63, G15]
IMF Staff Papers (2009) **56,** 683–741. doi:10.1057/imfsp.2009.21

There is broad consensus in the economic literature that the presence of costly sovereign defaults is the mechanism that makes sovereign debt possible (Dooley, 2000). In the case of sovereign debt, creditor rights are not as strong as in the case of private debts. If a private firm becomes insolvent, creditors have a well-defined claim on the company's assets even if they may be insufficient to cover the totality of the debt. These legal rights are

*Eduardo Borensztein is Regional Economic Advisor for the Southern Cone at the Inter-American Development Bank (IDB). Ugo Panizza is Chief of the Debt and Finance Analysis Unit Division on Globalization and Development Strategies, UN Conference on Trade and Development. Research on this paper was initiated when both authors were with the IDB Research Department. The authors would like to thank two anonymous referees, Bob Flood, Guillermo Calvo, Jeff Frieden, Eduardo Levy Yeyati, Guido Sandleris, and the participants of seminars at the IDB and the International Economic Association for useful suggestions and comments, and Patricio Valenzuela and Monica Yañez for excellent research assistance.

necessary for private debts to exist.[1] In the case of a sovereign debt, in contrast, the legal recourse available to creditors has limited applicability because many assets are immune from any legal action, and uncertain effectiveness because it is often impossible to enforce any favorable court judgment.[2] But the literature sustains that sovereign debt markets are still viable because, if defaults are costly in some way to the borrowing country, there will be an incentive to repay debts, regardless of the effectiveness of legal recourse. It is noteworthy that we use the term default to encompass any situation in which the sovereign does not honor the original terms of the debt contract, including voluntary restructurings where there is a loss of value for the creditors. This is entirely in line with the concept applied by credit-rating agencies.

There is much less agreement on what the costs of default actually are, let alone their magnitude. Traditionally, the sovereign debt literature has focused on two mechanisms: reputational costs, which in the extreme could result in absolute exclusion from financial markets, and direct sanctions such as legal attachments of property and international trade sanctions imposed by the countries of residence of creditors. The reputational cost of default has a well-established theoretical and historical tradition, with Eaton and Gersovitz (1981) presenting the canonical, formal model. An influential article by Bulow and Rogoff (1989a), however, casts doubts on the validity of the reputational cost, and points instead to direct sanctions—such as trade embargoes—as the only viable mechanism that makes governments repay their debts. While their argument may not be robust to other model specifications, there is a widespread body of literature based on the sanctions view.[3] But there is comparatively little work on assessing the empirical relevance of these mechanisms. An exception is Tomz (2007), who based on an extensive review of historical case studies, finds widespread evidence in favor of the importance of reputation in financial markets, in contrast to the view that seemed to prevail earlier (for example, Lindert and Morton, 1989).[4]

[1]In fact, even in private markets debt contracts are not fully enforceable. Djankov and others (2007) show that creditor protection through the legal system is positively correlated with the development of the private credit market.

[2]Some recent litigation strategies against sovereigns in default appear to focus on becoming enough of a nuisance such that sovereigns would acquiesce to an out-of-court settlement, rather than seeking a direct enforcement of property rights. Those strategies, however, can succeed only if the plaintiffs hold a small fraction of the debt. For a detailed discussion of the law and economics of sovereign debt, see Panizza, Sturzenegger, and Zettelmeyer (forthcoming).

[3]Influential papers that base their results on the assumption that default causes a direct loss of output or trade access—in line with the sanctions view—includes Krugman (1988) and Sachs (1989).

[4]For recent reviews, see De Paoli, Hoggarth, and Saporta (2006); Hatchondo, Martinez, and Sapriza (2007); and Panizza, Sturzenegger, and Zettelmeyer (forthcoming).

More recently, recognizing that holders of government debt are not only foreign investors (in fact, perhaps a majority of investors in government bonds are domestic institutions and resident individuals in many cases nowadays) more attention has been paid to the consequences of default for the domestic economy, in particular the banking sector.

This channel is particularly relevant because, in many emerging economies, banks hold significant amounts of government bonds in their portfolios. Thus, a sovereign default would weaken their balance sheets and even create the threat of a bank run. To make matters worse, banking crises are usually resolved through the injection of government "recapitalization" bonds and central bank liquidity. But in a debt crisis, government bonds have questionable value and the domestic currency may not carry much favor with the public either. A corollary of the domestic economic costs of debt crises is that they may also involve a political cost for the authorities. A declining economy and a banking system in crisis do not bode well for the survival in power of the incumbent party and the policymaking authorities. Although such linkage has been noted in the case of currency devaluations, for example, it has not been explored in the case of debt defaults.

This paper evaluates empirically each one of the suspected mechanisms through which default costs may affect a sovereign government. It should be recognized at the outset that it is quite difficult to find econometrically sound ways to isolate the costs of default. For instance, while it is easy to find a negative correlation between default and growth, it is much more difficult to test whether this negative correlation is driven by the default episode or by a series of other factors that are the cause of both the debt default and an economic recession. Moreover, it is also hard to identify the direction of causality between growth and default.

Thus, this paper has more modest objectives. Rather than attempting to quantify precisely the costs of default on sovereign debt, the objective is to evaluate if there is some empirical basis for—or lack of evidence against—each one of the mechanisms that are believed to be relevant, and perhaps discard those mechanisms that appear to be less consistent with the data.

In addition to the traditional reputational and trade sanctions, the paper explores the significance of effects that operate through the domestic banking system and the political costs of default for the government.[5]

Identifying the channel and magnitude of the costs of sovereign default with some degree of precision would be important for a number of reasons. The "default point" for a sovereign should be the point at which the cost of servicing debt in its full contractual terms is higher than the costs incurred from seeking a restructuring of those terms, when these costs are comprehensively measured. An accurate measure of the default point is

[5]This paper does not explore the role of collateral. For a discussion of this issue see Dooley, Garber, and Folkerts-Landau (2007).

necessary, for example, to assess how "safe" a certain level of debt is, namely, how likely it is that an economic shock would trigger a situation of default.[6] In fact, it is not possible to compute the probability of default, or to price a sovereign bond without making a judgment about the default point.

From a policy perspective, an understanding of the channels through which default costs apply can help design initiatives to improve the functioning of international financial markets and lower the cost of borrowing for many sovereigns. For example, if the costs of default apply largely through international trade, a more open economy would have a higher default point than a more closed economy, other things equal, and would be less risky for lenders, which would result in lower borrowing costs.

This paper analyzes the incidence of four types of cost that may result from an international sovereign default: reputational costs, international trade exclusion costs, costs to the domestic economy through the financial system, and political costs to the authorities. We find that reputational costs, as reflected in credit ratings and interest rate spreads, are significant but appear to be short-lived; that despite evidence that trade and trade credit are negatively affected by default, controlling for trade credit does not seem to modify the effect of default on trade; that growth in the domestic economy suffers, and more so in cases where the causes for default seem less compelling, although this effect also seems to be short-lived; that default episodes seem to cause banking crises and not vice versa, but that—outside of banking crisis episodes—more credit dependent industries do not suffer more than other industries following a sovereign default; and that the political consequences of a debt crisis are dire for incumbent governments and finance ministers, broadly in line with what happens in currency crises.

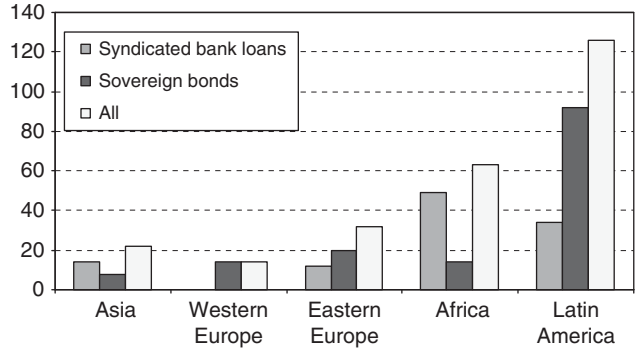
I. Two Hundred Years of Sovereign Default

Dating sovereign default episodes and measuring their duration is not a straightforward exercise. Table A1 uses four different sources to classify default episodes over the last 200 years.[7] Although there is substantial coincidence between the four sources, the match is far from perfect. There are, for instance, several episodes that are classified as defaults by Standard & Poor's but not classified as defaults by Beim and Calomiris (2000), and also a few

[6]This is analogous to the evaluation of the probability of default by a private company. Its default point, in theory, is the point at which existing liabilities equal the total market value of its assets, that is, its equity value is zero. See Merton (1974) and Kealhofer (2003). For an application to the sovereign case, see Gapen and others (2005).

[7]The first four columns of the table use data from Standard and Poor's and include all defaults on sovereign bonds and bank loans. Columns 5 and 6 are from Beim and Calomiris (2000) and also include defaults on suppliers' credit. Column 7 is from Sturzenegger and Zettelmeyer (2006) and is based on primary data from Beim and Calomiris (2000), and Lindert and Morton (1989). The last column uses data from Detragiache and Spilimbergo (2001). The definitions of default episodes applied by each one of these sources are presented in Table A1.

Figure 1. Number of Defaults (1824–2004)



Note: This figure plots the geographical distribution of sovereign defaults that took place over a period 1824–2004. The figure also divides default episodes between default on sovereign bonds and sovereign syndicated bank loans. Default episodes are identified using the Standard & Poor's definition of sovereign default (see Table A1).

episodes that are classified as defaults by Beim and Calomiris (2000) and not by Standard and Poor's. There are also differences in the methodology used to measure the length of a default episode. Beim and Calomiris (2000), for instance, find fewer but longer lasting default episodes because they tend to merge into a unique episode defaults that occurred within five years. The methodology used by Detragiache and Spilimbergo (2001), instead, leads to code as defaults several episodes that are not classified as defaults by Standard and Poor's.[8] Largely on the basis of its completeness, the rest of the paper will use Standard and Poor's classifications as reported in the first four columns of Table A1. Moreover, alternative definitions of default include debt rescheduling with official creditors which, in our view, involves a different cost/benefit analysis on the part of the debtor governments, because financial relationships with multilateral institutions or other governments are based on different principles from those of private markets. Having said this, the results of the paper are robust to using the definition of default adopted by Detragiache and Spilimbergo (2001) or to including the Paris Club rescheduling events studied by Rose (2005). Furthermore, while some papers (e.g. Kraay and Nehru, 2006; and Pescatori and Sy, 2007) include episodes of near default in their definition of debt crisis, we do not include these episodes in our empirical exercises because we are interested in the cost of actual default, instead of the cost of debt crises that do not result in an actual default.

Figure 1 shows the number of default episodes by geographical area for the period from 1824 to 2004. Latin America is the region with the highest

[8]This is the case, for instance, of Nigeria, Zambia, and Sierra Leone in the 1970s; Egypt and El Salvador in the 1980s; and Sri Lanka, Thailand, Korea, and Tunisia in the 1990s.

Table 1. Default Episodes

	Period	Africa			Asia			Eastern Europe			Latin America			Western Europe			All		
		Bond	Bank	All	Bond	Bank	All	Bond	Bank	All	Bond	Bank	All	Bond	Bank	All	Bond	Bank	All
Number of episodes	1824–40	0	0	0	0	0	0	1	0	1	14	0	14	4	0	4	19	0	19
Average length		0.0	0.0	0.0	0.0	0.0	0.0	52.0	0.0	52.0	21.4	0.0	21.4	24.8	0.0	24.8	23.7	0.0	23.7
Number of episodes	1841–60	0	0	0	0	0	0	0	0	0	5	0	5	1	0	1	6	0	6
Average length		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	8.0	6.0	0.0	6.0	7.7	0.0	7.7
Number of episodes	1861–80	3	0	3	1	0	1	0	0	0	14	0	14	1	0	1	19	0	19
Average length		10.0	0.0	10.0	5.0	0.0	5.0	0.0	0.0	0.0	14.1	0.0	14.1	2.0	0.0	2.0	12.4	0.0	12.4
Number of episodes	1881–1900	0	0	0	0	0	0	2	0	2	16	0	16	1	0	1	19	0	19
Average length		0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	3.4	0.0	3.4	9.0	0.0	9.0	3.6	0.0	3.6
Number of episodes	1901–20	5	0	5	1	0	1	2	0	2	11	0	11	1	0	1	20	0	20
Average length		1.6	0.0	1.6	13.0	0.0	13.0	2.5	0.0	2.5	5.3	0.0	5.3	1.0	0.0	1.0	4.3	0.0	4.3
Number of episodes	1921–40	1	0	1	4	0	4	8	0	8	20	0	20	6	0	6	39	0	39
Average Length		3.0	0.0	3.0	7.3	0.0	7.3	12.6	0.0	12.6	9.3	0.0	9.3	6.7	0.0	6.7	9.2	0.0	9.2
Number of episodes	1941–60	0	0	0	1	0	1	2	0	2	1	0	1	0	0	0	4	0	4
Average length		0.0	0.0	0.0	10.0	0.0	10.0	13.5	0.0	13.5	1.0	0.0	1.0	0.0	0.0	0.0	9.5	0.0	9.5
Number of episodes	1961–70	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2
Average length		15.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	8.0	0.0	8.0
Number of episodes	1971–80	0	5	5	0	3	3	0	0	0	0	7	7	0	0	0	0	15	15
Average length		0.0	13.6	13.6	0.0	16.0	16.0	0.0	0.0	0.0	0.0	4.9	4.9	0.0	0.0	0.0	0.0	10.0	10.0
Number of episodes	1981–90	1	33	34	0	6	6	0	5	5	5	24	29	0	0	0	6	68	74
Average length		2.0	8.5	8.4	0.0	10.0	10.0	0.0	5.6	5.6	3.6	8.7	7.8	0.0	0.0	0.0	3.3	8.5	8.1
Number of episodes	1991–2004	3	11	14	1	5	6	5	7	12	5	3	8	0	0	0	14	26	40
Average length		2.0	5.1	4.4	1.0	2.2	2.0	1.4	5.7	3.9	1.6	4.0	2.5	0.0	0.0	0.0	1.6	4.6	3.5

Note: This table lists the number and average duration of sovereign default episodes that took place in the period 1824–2004 by geographical region and time period. The table also divides default episodes between defaults on sovereign bonds and sovereign syndicated bank loans. Default episodes are identified using the Standard & Poor's definition of sovereign default (see Table A1).

number of default episodes at 126, Africa, with 63 episodes, is a distant second. The Latin American "lead" is, however, largely determined by the fact that Latin American countries gained independence and access to international financial markets early in the 19th century, while most African countries continued to be European colonies for another 100 or 150 years Among the developing regions, Asia shows the lowest number of defaults. Table 1 groups the various default episodes by time period and geographical area. Besides reporting the number of episodes, the table also reports the average length of the episodes.

As noted by Sturzenegger and Zettelmeyer (2006), default episodes tend to happen in clusters and usually follow lending booms. The first cluster of defaults happened in the period that spans from 1824 to 1840 and followed a lending boom driven by the newly acquired independence of most Latin American countries. Of 19 default episodes recorded during this period, 14 involved Latin American countries. The other five default episodes involved Greece, Portugal, and Spain (three episodes). The average length of the default episodes of this period (more than 20 years) suggests difficult restructuring processes.

The following period (1841–60) was relatively tranquil and comprised only six default episodes. However, a lending boom developed at this time, which soon resulted in a new series of default episodes (Lindert and Morton, 1989; Sutter, 2003). The period from 1861 to 1920 was characterized by 58 default episodes, including 41 episodes in Latin America and eight in Africa.[9] Resolution of default improved dramatically in speed, with the length of the average default period dropping to less than five years by 1881–1920.

The next wave of defaults was associated with the Great Depression and the Second World War. The 1921–40 period was punctuated by 39 default episodes. Again, more than half of these defaults happened in Latin American countries and more than one-third of them (16 episodes) in Europe. This is the last period in which we observe debt default episodes among western European countries.

By the end of the war, most developing countries had completely lost access to the international capital market. As a consequence, over the period that goes from 1941 to 1970 we observe very few default episodes (six episodes in total).[10] Lending to developing countries restarted timidly in the 1960s, but exploded after the oil shock of 1973 creating the need of recycling the earnings of oil-producing countries. One feature that differentiated the lending boom of the 1970s from previous ones is the vehicle used to extend

[9]This is also the period in which we observe the first default on bank loans (Russia in 1918).

[10]Of these six episodes, two were related to World War II (Hungary in 1941 and Japan in 1942), and other two were largely politically motivated defaults by communist countries (Czechoslovakia in 1959 and Cuba in 1960). The remaining two were Costa Rica (1962) and Zimbabwe (1965).

credit to developing countries. While in previous episodes developing countries borrowed by issuing bonds, in the 1970s most of the lending to developing countries took the form of syndicated bank loans. While the lending instrument was different, the fate of the lending boom did not differ, and the tranquil period was soon followed by a chain of defaults. Already in the 1970s, we observe 15 episodes of defaults on syndicated bank loans. The "debt crisis," however, did not erupt until the Mexican payment suspension of August 1982, which was soon followed by more than 70 default episodes (34 episodes involving African countries and 29 involving Latin American countries).

As in previous cases, credit to developing countries (including to countries that did not experience debt service disruptions) died out in the aftermath of the crisis and did not restart until the end of the restructuring process. The average default lasted approximately nine years, which suggests that restructuring syndicated bank loans was more cumbersome than restructuring international bonds. Eventually the defaulted bank loans were restructured by issuing new, partly collateralized, bonds that took the name of Brady Bonds (after the name of U.S. Treasury Secretary Nicholas Brady who was main architect of the restructuring process).

The Brady Plan played a key role in creating a bond market for debt issued by emerging market countries and, together with low interest rates in the United States, contributed to a new lending boom to emerging market countries (see Calvo, Leiderman, and Reinhart, 1993). The defaults that followed this new lending boom are recent history. Over the 1991–2004 period, we observed 40 defaults (14 on bonds and 26 on syndicated bank loans). Most of the syndicated bank loan defaults took place in Africa, where the bond instrument had not become widely used yet, while most of the bond defaults took place among Latin American issuers.

II. Default and GDP Growth

As a first stab at the issue at hand, we examine the effect of default on GDP growth. While this may not distinguish between competing theories of default costs, it can say something about the significance and lag structure of the costs. In addition, we are interested in exploring if the GDP costs are higher for countries that default in circumstances that seem less easily identified as an insolvency problem, what could in principle identify cases of "strategic" default.

Note that in this paper we will follow the traditional literature and focus on defaults on external debt. To the best of our knowledge, Reinhart and Rogoff's (2008) is the only attempt to document what happens around domestic debt defaults. They show that domestic defaults tend to happen during deep recessions and that, in the year of the default, GDP is 8 percent lower than GDP four years before the default. However, they also show that GDP starts recovering in the year after the default and that as early as three years after the default, GDP is back at the level it had four years before the default. In fact, when they compare domestic defaults with external defaults, Reinhart and Rogoff show that the former are characterized by a sharper

contraction in the run up to the default, but also by a sharper recovery in the post-default period.

Before going into the details of the estimation, it should be acknowledged that there are unresolved endogeneity problems in the relationship between default and GDP growth, and this paper does not provide any breakthroughs in this regard. The problem is relevant because the theoretical literature has also noted the causation from weak growth to default. While the early literature based on Eaton and Gersovitz (1981) focused on "strategic" defaults (in the sense that defaults took place in good times when the country could easily have paid), recent work by Aguiar and Gopinath (2006) and Rochet (2006) shows that models that add persistent shocks to a simple Eaton and Gersovitz's (1981) framework yield procyclical borrowing and (nonstrategic) default episodes. Arellano (2008) shows that even in the presence of i.i.d. endowment shocks, it is possible to generate a region of risky borrowing in which defaults take place after a negative shock. Mendoza and Yue (2008) adopt an alternative modeling strategy and show that defaults may lead to an inefficient reallocation of labor because they limit the ability of private agents to obtain the working capital necessary to buy imported inputs. Kohlscheen and O'Connell (2007) reach similar conclusions by focusing on the role of trade credit. Tomz and Wright (2007) show that a calibrated model based on Aguiar and Gopinath (2006) predicts that almost all defaults should happen during bad times. Next, they take the model to the data by using a large number of sovereign default episodes between 1820 and 2004 and show that about two-thirds of defaults happen when output is below trend. They argue that the difference between the predictions of the model and the data can be explained by political shocks and exogenous changes in the availability of international credit.

We follow Chuan and Sturzenegger (2005), who estimates several cross-section and panel growth regressions and find that default episodes are associated with a reduction in growth of approximately 0.6 percentage points. If the default coincides with a banking crisis, the effect is much larger and growth decreases by 2.2 percentage points. In Table 2, we present results

Table 2. Default and Growth, Panel, 1972–2000

	(1) GROWTH	(2) GROWTH	(3) GROWTH	(4) GROWTH
INV_GDP	1.211	1.152	1.205	1.146
	(8.63)***	(8.08)***	(8.58)***	(8.04)***
POP_GR	−0.120	−0.119	−0.121	−0.118
	(1.22)	(1.22)	(1.24)	(1.20)
GDP_PC70s	−0.121	−0.124	−0.121	−0.125
	(7.25)***	(7.34)***	(7.24)***	(7.37)***
SEC_ED	0.014	0.018	0.014	0.018
	(1.62)	(2.03)**	(1.63)	(2.03)**
POP	0.004	0.004	0.004	0.004
	(6.32)***	(6.72)***	(6.30)***	(6.66)***

Table 2 *(concluded)*

	(1) GROWTH	(2) GROWTH	(3) GROWTH	(4) GROWTH
GOV_C1	2.965	2.974	2.970	3.000
	(2.91)***	(2.89)***	(2.89)***	(2.89)***
CIV_RIGTH	−0.026	−0.033	−0.026	−0.035
	(0.37)	(0.45)	(0.37)	(0.49)
DTOT	−0.270	−0.111	−0.277	−0.082
	(0.22)	(0.10)	(0.23)	(0.07)
OPEN	2.149	2.156	2.151	2.146
	(3.50)***	(3.50)***	(3.49)***	(3.48)***
SSA	−0.859	−0.832	−0.839	−0.788
	(2.84)***	(2.70)***	(2.73)***	(2.54)**
LAC	−0.399	−0.430	−0.367	−0.355
	(1.60)	(1.70)*	(1.45)	(1.39)
TRANS	−0.064	−0.266	−0.071	−0.268
	(0.10)	(0.44)	(0.11)	(0.44)
BK_CR	−1.087	−1.068	−1.092	−1.080
	(4.64)***	(4.53)***	(4.65)***	(4.57)***
DEF	−1.239	−1.184	−1.282	−1.370
	(4.32)***	(3.82)***	(4.38)***	(4.06)***
DEF_B		−1.388		−1.291
		(2.11)**		(1.93)*
DEF_B1		0.481		0.916
		(0.87)		(1.49)
DEF_B2		0.337		0.495
		(0.63)		(0.82)
DEF_B3		0.994		1.242
		(1.55)		(1.90)*
END_DEF			−0.665	−1.135
			(1.14)	(1.77)*
END_DEF1			0.002	0.003
			(0.00)	(0.01)
END_DEF2			0.122	−0.384
			(0.22)	(0.70)
Constant	1.387	1.474	1.389	1.471
	(2.16)**	(2.28)**	(2.16)**	(2.28)**
Observations	2,048	1,985	2,048	1,985
R-squared	0.22	0.22	0.22	0.22

Note: This table shows the results of a set of regressions where the dependent variable is annual real per capita GDP growth and the explanatory variables are investment divided by GDP (INV_GDP); population growth (POP_GR); GDP per capita in 1970 measured in U.S. dollars (GDP_PC70s); percentage of the population that completed secondary education (SEC_ED); total population (POP); lagged government consumption over GDP (GOV_C1); an index of civil rights (CIV_RIGHT); the change in terms of trade (DTOT); the degree of openness (OPEN, defined as exports plus imports divided by GDP); a dummy variable taking a value of one in presence of a banking crisis (BK_CR); three regional dummies for sub-Saharan Africa (SSA), Latin America and Caribbean (LAC), and transition economies (TRANS); a dummy variable that takes a value of one each year that a country is in default and zero otherwise (DEF); and dummy variable that takes a value of one in the first year of a default episode and zero otherwise (DEF_B); (DEF_B1, DEF_B2, and DEF_B3 are the first, second and third lags of DEF_B). Robust *t*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

from several regressions aimed at estimating the relationship between default and growth. In all regressions we use an unbalanced panel that includes up to 83 countries for the 1972–2000 period, and estimate the following model:

$$GROWTH_{i,t} = \alpha + \beta X_{i,t} + \gamma DEFAULT_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where $GROWTH_{i,t}$ is per capita annual real GDP growth in country i and year t, X is a matrix of controls,[11] and $DEFAULT$ is a set of dummy variables tracking default episodes. In column 1, the variable *DEF* takes a value of one each year that a country is in default and zero otherwise. We find that, on average, default is associated with a decrease in growth of 1.2 percentage points per year. This figure is consistent with Chuan and Sturzenegger's (2005) finding that default has a negative effect on growth that ranges between 0.5 and 2 percentage points.

We next explore the dynamic structure of the impact of default. In column 2, we augment the regressions with a variable that takes a value of one at the beginning of the default episode (*DEF_B*) and three lags of this variable (*DEF_B1, DEF_B2*, and *DEF_B3*). We find that the impact of default seems to be short-lived. We estimate a large effect in the first year of the default episode (with a drop in growth of 2.6 percentage points), and we find no statistically significant effect of the lagged default variables. This is consistent with results in Levy, Yeyati, and Panizza (2005), who, using quarterly data, find that crises precede defaults, and that defaults tend to occur at the trough of the recession.

As a check on the validity of the above result, we test whether the estimated negative effect of default is in fact an artifice of the rebound in growth that tends to occur in the post-default years. To control for this possibility, in columns 3 and 4 we augment the regressions with a dummy variable that takes a value of one when a country exits from default (*END_DEF*) and two lags of this variable.[12] We find that these dummy variables are not statistically significant and do not affect the estimated effect of default in the original regressions.

The direction of causality in the relationship between sovereign defaults and growth raises some questions. While the previous regressions suggest a robust association between debt defaults and low growth, they are only indicative of a correlation between the two variables. In fact, debt defaults are usually a consequence of some economic shocks, such as terms-of-trade

[11]Our set of controls includes the investment over GDP ratio (*INV_GDP*), population growth (*POP_GR*), GDP per capita in the early 1970s (*GDP_PC70s*), percentage of the population that completed secondary education (*SEC_ED*), total population (*POP*), lagged government consumption over GDP (*GOV_C1*), an index of civil rights (*CIV_RIGHT*), the change in terms of trade (*DTOT*), the degree of openness (*OPEN*), a dummy variable taking a value of one in presence of a banking crisis (*BK_CR*), and three regional dummies for sub-Saharan Africa (*SSA*), Latin America and Caribbean (*LAC*), and transition economies (*TRANS*). Substituting country fixed for the regional dummies does not change the results.

[12]That is, if a country was in default from 1982 to 1986, *END_DEF* takes a value of one in 1987.

shocks, sudden stops, currency crises, and so on that also hurt growth in some fashion. Moreover, the *anticipation* of a default episode (rather than the default) may carry substantial costs (Levy, Yeyati, and Panizza, 2005). While the regressions in Table 2 control for some of these effects (for instance, they control for banking crises), they cannot account for all the variables that jointly affect the probability of a sovereign default and an economic recession. Hence, lower growth might not be the consequence of default but of other factors that also affect debt sustainability.

Identifying the causal effect of default on growth would require an instrument for default (that is, a variable that affects the probability of default without having a direct effect on GDP growth). Unfortunately, such instrument has not been found and it may not exist. Here we set a more modest objective and use a two-stage approach to attempt to disentangle the effect of the ''predictable'' component of default and the unpredictable one. That is, we try to decompose the correlation between default and economic growth in two parts: the effect owing to all the variables which can be used to predict the probability of default and a residual effect, which we interpret as the decision of default itself, over and above its causes. More precisely, the default dummy can be statistically divided into two components:

$$default_{i,t} = pred\_def_{i,t} + v_{i,t}, \tag{2}$$

where $pred\_def_{i,t,}$ denotes the predicted probability of default obtained by running a logit regression of $default_{i,t}$ on a set of standard predictors of default, and $v_{i,t}$ is the error term of the logit model.[13]

Within this setup, $pred\_def_{i,t}$ captures the predicted effect of default and proxies for the fact that an increase in the probability of default may have a direct effect on growth, but $v_{i,t}$ captures the unpredictable components of default. After having estimated the anticipated and unanticipated component of default, we can include these two variables in a set of regressions similar to those of Table 2 and gauge their distinct effect on growth. As we predict default using a nonlinear model, this strategy is similar but not identical to directly adding to the original growth regression all the variables used to predict default. Again, the objective is not to identify the causal effect of default but just split the correlation between default and growth between a predictable and unpredictable component of default.

Table 3 presents the main results. As the sample of Table 3 is smaller than that of Table 2 (843 vs. 2,048 observations),[14] we start by reestimating the basic model of Table 2 for the restricted sample and check whether there are any differences in the estimated cost of default and we find that the results are

[13]To predict default we use model similar to that of Manasse, Roubini, and Schimmelpfennig (2003). Full regression results are available upon request.

[14]This is due to the fact that it does not make much sense to estimate the probability of default for industrial countries and, hence, Table 3 only includes developing countries. Furthermore, estimating the probability of default requires variables that are not available for all the countries included in the regressions reported in Table 2.

Table 3. Default and Growth, Panel, 1972–2000

	(1) GROWTH	(2) GROWTH	(3) GROWTH	(4) GROWTH
INV_GDP	1.607	1.584	1.635	1.584
	(5.11)***	(5.00)***	(4.58)***	(5.03)***
POP_GR	−0.331	−0.337	−0.319	−0.338
	(1.35)	(1.37)	(1.16)	(1.38)
GDP_PC70s	−0.259	−0.269	−0.300	−0.275
	(1.38)	(1.43)	(1.53)	(1.46)
SEC_ED	0.036	0.037	0.039	0.037
	(1.56)	(1.59)	(1.63)	(1.60)
POP	0.006	0.006	0.005	0.006
	(5.36)***	(5.29)***	(4.12)***	(5.25)***
GOV_C1	3.402	3.281	3.084	3.299
	(2.95)***	(2.76)***	(2.45)**	(2.75)***
CIV_RIGTH	−0.090	−0.093	−0.050	−0.092
	(0.71)	(0.73)	(0.36)	(0.72)
DTOT	−2.271	−2.333	−2.133	−2.342
	(1.20)	(1.23)	(1.16)	(1.24)
OPEN	1.764	1.816	1.677	1.818
	(1.52)	(1.55)	(1.31)	(1.55)
SSA	−0.542	−0.510	−0.637	−0.520
	(1.16)	(1.08)	(1.23)	(1.07)
LAC	−0.508	−0.457	−0.381	−0.460
	(1.41)	(1.26)	(1.03)	(1.26)
TRANS	−2.443	−2.437	−2.216	−2.430
	(2.53)**	(2.53)**	(2.02)**	(2.50)**
BK_CR	−1.364	−1.328	−1.188	−1.324
	(3.81)***	(3.73)***	(3.36)***	(3.71)***
DEF	−1.043			
	(3.15)***			
DEF_PR		−1.440	−1.246	−1.443
		(2.30)**	(1.89)*	(2.29)**
DEF_U		−0.930	−1.037	−0.930
		(2.46)**	(2.69)***	(2.32)**
DEF_PRB			−13.700	
			(2.13)**	
DEF_PRB1			0.330	
			(0.07)	
DEF_PRB2			3.506	
			(0.99)	
DEF_PRB3			−0.929	
			(0.24)	
DEF_UB			0.000	
			(0.00)	
DEF_UB1			1.098	
			(1.71)*	
DEF_UB2			0.860	
			(1.32)	
DEF_UB3			0.898	
			(1.17)	
END_DEF				−0.237
				(0.36)

Table 3 *(concluded)*

	(1) GROWTH	(2) GROWTH	(3) GROWTH	(4) GROWTH
END_DEF1				0.266
				(0.49)
END_DEF2				0.149
				(0.24)
Constant	2.629	2.660	−0.435	2.662
	(1.95)*	(1.97)**	(0.30)	(1.97)**
Observations	843	843	726	843
R-squared	0.26	0.26	0.28	0.26

Note: This table shows the results of a set of regressions where the dependent variable is annual real per capita GDP growth and the explanatory variables are investment divided by GDP (INV_GDP); population growth (POP_GR); GDP per capita in 1970 measured in U.S. dollars (GDP_PC70s); percentage of the population that completed secondary education (SEC_ED); total population (POP); lagged government consumption over GDP (GOV_C1); an index of civil rights (CIV_RIGHT); the change in terms of trade (DTOT); the degree of openness (OPEN, defined as exports plus imports divided by GDP); a dummy variable taking a value of one in presence of a banking crisis (BK_CR); three regional dummies for sub-Saharan Africa (SSA), Latin America and Caribbean (LAC), and transition economies (TRANS); a dummy variable that takes a value of one each year that a country is in default and zero otherwise (DEF); the predicted component of DEF (DEF_PR); the unexpected component of DEF (DEF_U); the predicted component of DEF measured in the first year of a default episode (DEF_PRB); and the unexpected component of DEF measured in the first year of a default episode (DEF_UB) (DEF_PRB1, DEF_PRB2, and DEF_PRB3 are the first, second and third lags of DEF_PRB; DEF_UB1, DEF_UB2, and DEF_UB3 are the first, second and third lags of DEF_UB); a dummy variable that takes a value of one in the first year after the end of a default episode (END_DEF ; END_DEF1 and END_DEF2 are the first and second lags of END_DEF). Robust *t*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

basically unchanged (column 1, Table 3). In particular, we find that the effect of default is a bit smaller but, at 1 percent, still sizable, and it is still highly statistically significant.

The split between anticipated and unanticipated components of default reveals that both variables are statistically significant. The estimate reported in column 2 of the anticipated effect (*DEF_PR*), at 1.4 percent, is slightly larger than the unanticipated component (*DEF_U*), which is close to 1 percent. This suggests that the default decision itself may involve significant collateral costs for the domestic economy.

In column 3, we estimate the dynamic structure of the anticipated and unanticipated components of default.[15] We find that the anticipated default effect (*DEF_PRB*) is on impact negative, quite large, and statistically

[15]In order to estimate the probability of the beginning of the default episode, we used the logit described in Table A2 but restricted the dependent variable to take value one only in the first year of a default episode.

significant (we investigated whether the large coefficient of *DEF_PRB* was due to the presence of outliers but were unable to find evidence in this direction).

In contrast, while we find that the unanticipated component of default is still large and statistically significant, we find no significant negative effect in the first year. In the last column, we augment the regression in column 2 with *END_DEF* and its two lags and we find that the results are unchanged.[16]

We note that an alternative interpretation of the effect of the unexpected portion of the default variable is that it captures the cost of "unjustified" defaults, under the assumption that the magnitude of the costs of default to a country depends on whether the default was unavoidable or resulted from a weak willingness to pay. Much of the sovereign debt literature emphasizes the distinction between "ability" to pay and "willingness" to pay. The markets would punish debtors in the latter case, but will be more forgiving in the former case (see Grossman and van Huyck, 1988).[17] From this perspective, the specification above can be interpreted as a measure of the degree to which a default was justified by fundamental economic conditions.

One caveat with the previous analysis is that the variables included in the first stage are likely to be a subset of the information available to governments and markets. If one assumes that Grossman and van Huyck (1988) are right, such errors in our first stage regression would lead to an overestimation of the cost of anticipated defaults and an underestimation of the costs of unpredictable defaults.

We now turn to the investigation of the specific channels through which default may have a negative impact on growth.

III. Default and Reputation

As argued at the beginning of this paper, whether reputation has a significant effect or not plays a key role on the timing and the circumstances under which a sovereign will initiate a debt restructuring action.

In the seminal paper by Eaton and Gersovitz (1981), international lending is sustained by the fact that defaults are associated with a permanent exclusion from future borrowing. This assumption, however, was soon criticized because the threat of a permanent exclusion from the capital market is not time-consistent. Moreover, Bulow and Rogoff (1989b) argued that, even in the presence of such a threat, a defaulter could smooth

[16]One problem with the regressions of Tables 2 and 3 is that they are based on annual information and hence they cannot capture the precise timing of the default. Levy, Yeyati, and Panizza (2005) study the impact of default on growth by looking at quarterly data for emerging economies and find that output contractions precede defaults, and that the trough of the contraction coincides with the quarter of default.

[17]Alternatively one could try to identify the "avoidable" or unjustified defaults directly, but there are few cases that could clearly be labeled as resulting from lack of willingness to pay. Nearly all unilateral sovereign debt repudiation cases have stemmed from communist revolutions or other radical political postures, and the economic downturns probably resulted more from those political changes than from the debt defaults themselves.

consumption by purchasing insurance or investing a portion of its wealth abroad. For these reasons, Bulow and Rogoff (1989a) argued that positive international lending cannot be sustained without some form of direct punishment (such as trade embargoes).

However, a series of more recent papers argued that reputational concerns can sustain positive lending even in the absence of a threat of permanent exclusion from future borrowing. In Kletzer and Wright (2000), lenders collusion is guaranteed by the fact that the original lender can punish new lenders by forgiving the defaulter if the defaulter stops servicing the loans granted by new lenders. Wright (2003) shows that, even in the presence of contracts à la Bulow-Rogoff, the existence of syndicated lending generates incentives to collude in punishing default. The key idea of Kletzer and Wright's (2000) and Wright's (2003) models is that, rather than triggering permanent exclusion from credit markets, a default leads to a new financial relationship in terms at which the defaulter's utility is the same as that would result from permanent exclusion.[18]

Studies that provide empirical evidence in support to the "reputation view" include those by English (1996) and Tomz (2007). English (1996) focuses on defaults by U.S. states in the 19th century and argues that, because foreign creditors could not impose trade embargoes on the U.S. states, states that paid back their debt did so for reputational reasons alone, and not because of the threat of sanctions. Tomz (2007) describes the evolution of sovereign debt over the last three centuries and presents several stylized facts which are consistent with the reputational view. For instance, he shows that unjustified defaults during World War II (these are defaults by countries that did not participate in the war) triggered an exclusion from the international capital market which was twice as long as the exclusion suffered by "expected" defaulters. He also shows that "surprising" payers (that is, countries that were expected to default in the 1930s but did not default) were rewarded by investors with lower spreads when these countries re-accessed the international capital market. He also deconstructs the sanction view and argues that there is no evidence that defaults ever led to sanctions. He argues that the conventional argument that in the 1930s Argentina repaid its debt to avoid a trade embargo from the United Kingdom (Díaz-Alejandro, 1983) is not correct and provides evidence suggesting that Argentina repaid its foreign debt in order to strengthen its reputation of good debtor.[19] Although Mitchener and Weidenmier (2005) find that military pressure or political control were common responses to default episodes in the gold standard period, Tomz (2007) argues that gunboat diplomacy was driven by civil wars, territorial conflicts, and tort claims and not by default episodes.

[18]An ever more recent literature focuses on reputation vis-à-vis domestic agents (see Panizza, Sturzenegger, and Zettelmeyer, forthcoming, for a survey).

[19]Argentine Finance Minister Alberto Hueyo stated: "To honor existing commitments is always highly honorable, but to do it when everyone is failing to and at times of hardship … is a thousand times more valuable" (quoted in Tomz, 2007).

Although the evidence presented by English (1996) and Tomz (2007) in favor of the reputation view is persuasive, it remains unclear whether reputational costs alone are enough to justify the existence of the sovereign debt market. For instance, Arellano and Heathcote (2008) show that models in which if the only cost of default is *permanent* exclusion from future borrowing yield maximum sustainable debt levels which are much lower than the debt levels we observe in reality.

Regardless of the reasons that led Argentina or the U.S. states to repay their debts, there is by now agreement on the fact that default does not lead to a permanent exclusion from the international capital market. Although there is some capital market exclusion period following a default, countries that defaulted in the last three decades have regained access to international capital markets fairly quickly. Gelos, Sahay, and Sandleris (2004) find that countries that defaulted in the 1980s were able to regain access to international credit in about four years. Richmond and Dias (2008) study all defaults that took place between 1980 and 2005 and find that, on average, defaulters regain partial market access after 5.7 years and full market access after 8.4 years. Levy Yeyati (forthcoming) shows that countries that defaulted in the 1970–2004 period received lower net transfers in the years that followed the default episode but that the effects were not very large (they range between 0.1 and 1 percentage point of GDP). Thus, the evidence suggests that, while countries lose access during default, once the restructuring process is fully concluded, financial markets do not discriminate, in terms of access, between defaulters and nondefaulters. External factors and the mood of foreign investors seem to be far more important than default history in determining access to the international capital market. One example of this behavior can be found by observing that in the period that goes from the 1930s to the 1960s all Latin American countries were excluded from the world capital market, and this exclusion reached both countries that defaulted in the 1930s and countries, like the case of Argentina commented above, which had made a successful effort to avoid default. The recent lending booms and default experiences also provide evidence in the same direction. Several countries that had defaulted in the 1980s were able to attract large capital flows in the 1990s and countries that defaulted in the late 1990s regained access to the international capital market almost immediately after their debt restructurings. In fact, Richmond and Dias (2008) show that external financial market conditions are the most important factor in determining the speed with which defaulters are able to re-access the international capital markets.[20]

[20]An under-researched topic concerns the relationship between the size of the haircut and the conditions under which defaulters re-access to capital market (Panizza, Sturzenegger, and Zettelmeyer, forthcoming, and Trebesch, 2009, include discussions of this issue).

There is some evidence suggesting that markets also discriminate in terms of *cost* of credit, in the sense that default history is positively correlated with borrowing costs. What is not clear, however, is whether this effect is long lasting or not. In what follows, we review the existing literature and provide some new evidence.

Studies that measured the impact of default on borrowing costs have focused on both indirect and direct measures. The main indirect measure in this line of work is a country's credit rating. This is a relevant measure because credit ratings tend to be highly correlated with borrowing costs. Cantor and Packer (1996) were among the first to highlight the link between default history and credit ratings. In their study, they collect data for approximately 50 countries and regress credit ratings in 1995 on a set of eight explanatory variables, and find that this relatively small set of independent variables explains more than 90 percent of the variance in credit ratings.[21] They also find that a dummy variable that takes value one for countries that defaulted after 1970 is highly significant and associated with a drop of two notches in a country's credit rating. Along similar lines, Reinhart and others (2003) find that a history of default is associated with lower ratings assigned by *Institutional Investor*.

One important question that the literature does not seem to address is whether default has a long-term impact on credit ratings. That is, how long is the markets' memory? To answer this question, we estimate the following cross-country model:

$$RATING_i = \alpha + \beta X_i + \gamma DEFAULT_i + \varepsilon_i, \tag{3}$$

where *RATING* measures average credit ratings over the 1999–2002 period, X is a set of explanatory variables also measured over the 1999–2002 period and *DEFAULT* is the variable measuring previous history of default.[22]

We measure credit ratings by converting Standard and Poor's foreign-currency long-term credit ratings into numerical values (20 corresponds to AAA, 19 to AA+, 18 to AA, and so forth, all the way down to selective default rating, *SD*, which is assigned a value of zero). In selecting the explanatory variables we follow Cantor and Packer (1996) and include the log of GDP per capita *(LGDP_PC*), GDP growth (*GDPGR*), the log of inflation (*LINF*), the central government balance scaled by GDP (*CG_BAL* takes positive values for fiscal surpluses and negative values for deficits), the external current account balance scaled by GDP (*CA_BAL*), external debt over exports (EXDEXP), and a dummy variable that takes value one for

[21]It is remarkable that GDP per capita by itself explains 80 percent of the variance of credit rating, a fact not highlighted in the original paper (thanks to Kevin Cowan for pointing this out).

[22]We also estimated the model using average ratings for the 2000–04 period, and the set of explanatory variables averaged over the 1990–2000 period. The results did not change.

industrial countries (*IND*).[23] In column 1 of Table 4 we follow Cantor and Packer (1996) and measure the history of default with a dummy variable that takes value one if country *i* has defaulted over the 1970–2002 period and zero otherwise. Most variables have the expected sign and are statistically significant (the exceptions are GDP growth which has the wrong sign but is not statistically significant and the current account balance which has the expected sign but is not statistically significant). As in Cantor and Packer (1996), we find that this limited set of control variables explains more than 90 percent of the cross-country variance of credit ratings (the R^2 of the regression is 0.91). We also find that default history is negatively correlated with credit ratings. In particular, our point estimates indicate that default history leads to a drop in credit rating of 1.7 notches, slightly lower than the estimate of Cantor and Packer (2.5 notches).

In column 2, we add two control variables that have been used in previous studies. The first variable is public debt over GDP (*DEBT_GDP*) and the second is the index of original sin (*OR_SIN*), developed by Eichengreen, Hausmann, and Panizza (2005). Both variables have the right sign and are statistically significant. While we lose 16 observations, the results are essentially unchanged.

In column 3, we augmented the regression of column 2 with the standard deviation of the terms of trade (*SDTOT*) of the period 1991–2002. This variable has the right sign but is not statistically significant; the other results do not change. In column 4, we use a specification similar to the one of column 1 but substitute the default dummy with seven dummy variables aimed at tracking default history (*DEF1800* takes value 1 for countries that defaulted in the 19th century and zero otherwise; *DEF1900_50* takes value 1 for countries that defaulted over the 1900–50 period; *DEF1950_70* takes value 1 if countries that defaulted over the 1950–70 period; and so forth for the remaining four dummies). The results indicate that defaults episodes do not have a long-term impact on credit ratings. In fact, only defaults in the 1995–2002 period are significantly correlated with credit ratings over the 1999–2002 period. Panizza, Sturzenegger, and Zettelmeyer (forthcoming) use a similar model and show that the effect of default on credit rating lasts only for three years.

Next, we look at the direct impact of default on borrowing costs. Empirical studies of the effect of default on borrowing cost can be divided in three groups: (1) papers that do not find any effect of default on borrowing cost; (2) papers that find a long-lasting but small effect of defaults on

[23]Using external debt over GDP yields identical results. Our data for external debt come from the World Bank's GDF. As this data set only includes data for developing countries, we set *EXDEXP* equal to zero for industrial countries (therefore *EXDEXP* can be thought of as the following interaction $EE*(1-IND)$ where *EE* is a latent variable that contains data on external debt for industrial countries). In all our estimations we drop countries that were in default over the entire 1999–2004 period. The results are robust to keeping these countries in the sample.

borrowing costs; and (3) papers that find a temporary and rapidly decaying effect of default on borrowing cost.

The first group of papers includes work by Lindert and Morton (1989) and Chowdhry (1991) who find that countries that defaulted in the 19th century and in the 1930s did not suffer higher borrowing cost in the 1970s, and more recent work by Ades and others (2000) who find that default history had no significant effect on sovereign spreads in the late 1990s.

The second group of papers includes Eichengreen and Portes (1995) who focus on bonds issued in the 1920s and find that recent defaults were associated with an increase in spreads of approximately 20 basis points but that earlier defaults had no impact on borrowing cost, and Ozler (1993) who focuses on sovereign bank loans extended over the 1968–81 period and finds a small but statistically significant effect of default in the 1930s. While Ozler's findings suggest that default history has a long-term impact, it is worth

Table 4. Default and Credit Ratings, Cross Section Regression, 1999–2002

	(1) RATING	(2) RATING	(3) RATING	(4) RATING
LGDP_PC	1.627	1.418	1.215	1.366
	(4.69)***	(3.83)***	(3.20)***	(3.47)***
GDPGR	−1.968	−4.273	−5.324	−4.888
	(0.42)	(1.06)	(1.07)	(0.91)
LINF	−0.707	−0.817	−0.727	−0.932
	(3.48)***	(3.88)***	(3.04)***	(3.65)***
CG_BAL	14.131	6.899	8.079	9.411
	(2.61)**	(1.26)	(1.50)	(1.20)
CA_GDP	3.011	−2.800	−1.679	−1.697
	(0.64)	(0.74)	(0.40)	(0.41)
EXDEXPGDF	−0.834	−0.776	−0.750	−0.761
	(2.67)***	(3.05)***	(2.03)**	(2.13)**
IND	2.549	2.685	2.839	2.847
	(2.63)**	(2.97)***	(2.96)***	(2.66)**
DEFAULT	−1.669	−1.486	−1.855	
	(3.10)***	(2.86)***	(3.57)***	
DEBT_GDP		−0.022	−0.020	−0.020
		(2.99)***	(2.16)**	(2.73)***
OR_SIN		−1.368	−1.212	−1.143
		(2.42)**	(1.84)*	(1.56)
SDTOT			−4.102	
			(0.70)	
DEF1800				0.620
				(1.09)
DEF1900_50				−0.017
				(0.03)
DEF1950_70				0.426
				(0.56)
DEF1970_80				−0.043
				(0.06)

Table 4 *(concluded)*

	(1) RATING	(2) RATING	(3) RATING	(4) RATING
DEF1980_90				−1.049
				(1.35)
DEF1990_95				0.080
				(0.08)
DEF1995_02				−1.897
				(2.79)***
Constant	0.394	4.181	6.077	2.313
	(0.14)	(1.28)	(1.88)*	(0.73)
Observations	68	59	55	68
R-squared	0.91	0.94	0.95	0.92

Note: This table shows the results of a set of regressions where the dependent variable is average credit rating measured over the period 1999–2002 (20 corresponds to AAA, 19 to AA+, 18 to AA, and so forth, all the way down to selective default rating, SD, which is assigned a value of zero) and the explanatory variables are: the log of GDP per capita (measured in constant U.S. dollars, LGDP PC); real GDP growth (GDPGR); log inflation (LINF); central government budged balance as a share of GDP (CG BAL); current account balance as a share of GDP (CA BAL); total external debt as a share of exports (EXDEXP); a dummy variable that takes a value of one for the advanced economies and zero for all other countries (IND); a dummy variable that takes a value of one if the country defaulted in the period 1970–2002 and zero otherwise (DEFAULT); a dummy variable that takes a value of one if the country defaulted in the period 1800–1900 and zero otherwise (DEF1800); a dummy variable that takes a value of one if the country defaulted in the period 1900–1950 and zero otherwise (DEF1900 50); a dummy variable that takes a value of one if the country defaulted in the period 1950–1970 and zero otherwise (DEF1950 70); a dummy variable that takes a value of one if the country defaulted in the period 1970–1980 and zero otherwise (DEF197 80); a dummy variable that takes a value of one if the country defaulted in the period 1980–1990 and zero otherwise (DEF1980 90); a dummy variable that takes a value of one if the country defaulted in the period 1990–1995 and zero otherwise (DEF1990 95); and a dummy variable that takes a value of one if the country defaulted in the period 1995–2002 and zero otherwise (DEF1995 02). All explanatory variables (except the default dummies) are measured over the period 1999–2002. Robust *t*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

noting that her estimates do not seem to cluster the standard errors and, back-of-the-envelope, calculations suggest that clustering would substantially reduce the explanatory power of default in the 1930s. Dell'Ariccia, Schnabel, and Zettelmeyer (2002) also find that defaults have a long-lasting effect and show that countries that participated in the Brady exchange suffered higher borrowing costs in the late 1990s. They also show that the effect of the Brady exchange on borrowing costs increased after the Russian crisis of 1998.

The third group of papers includes recent work by Flandreau and Zumer (2004) who focus on the 1880–1914 period and find that default is associated with a jump in spreads of about 90 basis points in the year that follows the end of a default episode but that the effect of default on spreads declines very rapidly over time.

Table 5 reports a set of simple regressions aimed at explaining emerging market sovereign spreads over the 1997–2004 period. We use an unbalanced panel of up to 31 countries to regress the yearly average of EMBI global spreads over a set of standard controls and a set of variables that track default history (in all regressions we drop the observations for countries that are in default in the current year). The controls include the log of GDP per capita (*LGDP_PC*), the log of inflation (*LINF*), the fiscal balance scaled by GDP (*CG_BAL*), the current account balance scaled by GDP (*CA_BAL*), and the ratio of external debt over exports (*EXDEXP*). The default variables include a dummy taking a value of one if country's *i* last default was in year $t-1$ (*DEF_1YR*), a dummy variable taking a value of one if country's *i* last default was in year $t-2$ (*DEF_2YRS*), a dummy variable taking a value of one if country's *i* last default was between year $t-3$ and year $t-5$ (*DEF3_5YRS*), a dummy variable taking a value of one if country's *i* last default was between year $t-6$ and year $t-10$ (*DEF6_10YRS*), and a dummy variable taking a value of one if country's *i* last default was between year $t-11$ and year $t-25$ (*DEF11_25YRS*). The excluded dummy is the one for countries that defaulted before year $t-25$ or never defaulted.[24]

Column 1 uses a random effects model that allows for region fixed effects and year fixed effects. We find that default in year $t-1$ has a large and statistically significant effect on spreads amounting to 400 basis points. The effect of default the following year is still sizable, 250 basis points, but not statistically significant. Longer-lasting effects are small and not statistically significant. Taken at face value, these results suggest that investors react strongly but have short memory—a result that is consistent with what Flandreau and Zumer (2004) found for the Gold Standard period. Column 2 uses a fixed effect model. As the five default dummies are collinear with the country fixed effects, we drop *DEF11_25YRS*. Hence, the results for the default dummies should be interpreted as differences with respect to countries that did not default after year $t-10$. The results are similar to those of the random effect model of column 1. Columns 3 and 4 repeat the models of column 1 and 2 but do not control for *CG_BAL* and *CA_BAL* (this allows us to include two extra countries in the sample). The results do not change significantly. In columns 5 to 8, we control for the effect of credit ratings. In columns 5 and 6 we use the residual of a rating regression that includes all the control variables (excluding default history) used in Table 4.[25] While we find that ratings have a large and statistically significant effect on spreads (a one notch change in ratings is associated with a jump in spreads of 50 basis points), our finding that default episodes have a short-lived impact on spreads does not change. In fact, we find that when we control for credit

[24]The results are essentially identical if we add a dummy variable for countries that defaulted between year t–26 and t–50.

[25]In the case of column 5 we obtain the residuals by running a random effect model and in the case of column 6 we obtain the residuals by running a fixed effects model.

Table 5. Defaults and Bond Spreads, Panel Regression, 1997–2004

	(1) EMBIG	(2) EMBIG	(3) EMBIG	(4) EMBIG	(5) EMBIG	(6) EMBIG	(7) EMBIG	(8) EMBIG
LGDP_PC	−200.578	−1424.802	−218.969	−1237.708	−216.274	−1663.319	−47.260	−1172.255
	(4.08)***	(4.97)***	(4.70)***	(4.94)***	(3.32)***	(5.53)***	(0.90)	(3.89)***
LINF	46.061	25.281	55.359	31.052	54.589	33.042	36.787	26.325
	(2.95)***	(1.55)	(3.70)***	(1.96)*	(2.97)***	(1.70)*	(2.15)**	(1.35)
CG_BALW	−446.783	635.532			−718.671	99.209	373.806	237.916
	(0.68)	(0.85)			(1.06)	(0.13)	(0.59)	(0.31)
CA_GDPW	665.056	−342.523			794.891	−454.604	465.100	−757.808
	(1.73)*	(0.81)			(1.93)*	(0.98)	(1.20)	(1.53)
EXDEXPGDF	166.770	207.386	169.660	213.708	192.966	246.435	96.262	189.341
	(5.27)***	(4.53)***	(5.71)***	(4.80)***	(5.52)***	(5.13)***	(3.24)***	(3.88)***
DEF1YEAR	412.863	307.746	433.912	305.783	389.342	249.764	267.770	249.175
	(3.39)***	(2.52)**	(3.95)***	(2.68)***	(3.04)***	(2.04)**	(2.42)**	(2.03)**
DEF2YRS	246.746	188.244	267.262	162.114	238.877	145.339	134.276	144.640
	(2.10)**	(1.63)	(2.52)**	(1.49)	(1.99)**	(1.26)	(1.33)	(1.25)
DEF3_5YRS	122.262	61.572	169.914	68.725	105.895	14.997	4.983	14.682
	(1.28)	(0.70)	(1.92)*	(0.81)	(1.07)	(0.17)	(0.06)	(0.16)
DEF6_10YRS	112.608	39.982	123.758	45.416	104.661	32.995	14.330	32.061
	(1.31)	(0.64)	(1.53)	(0.73)	(1.17)	(0.53)	(0.21)	(0.51)
DEF11_25YRS	116.623		123.956		101.621		12.180	
	(1.25)		(1.38)		(1.06)		(0.17)	
RATING_RES					−40.583	−52.359		
					(2.03)**	(2.55)**		

Table 5 *(concluded)*

RATING							−62.546	−51.225
							(4.99)***	(2.49)**
Constant	1375.104	11054.177	1523.830	9563.936	1671.025	13401.740	1316.136	9674.835
	(3.60)***	(4.92)***	(4.19)***	(4.87)***	(3.38)***	(5.56)***	(3.74)***	(4.18)***
Observations	150	150	162	162	144	144	144	144
Number of cc	29	29	31	31	27	27	27	27
R-squared		0.56		0.53		0.58		0.58
Region fixed effects	Yes		Yes		Yes		Yes	
Country fixed effects		Yes		Yes		Yes		Yes
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows a set of regressions where the dependent variable measures yearly average sovereign spreads for up to 31 emerging market countries included in the JP Morgan EMBI global index. The explanatory variables are the log of GDP per capita (measured in constant U.S. dollars, LGDP PC); log inflation (LINF); central government budged balance as a share of GDP (CG_BAL); current account balance as a share of GDP (CA_BAL); total external debt as a share of exports (EXDEXP); a dummy variable taking a value of one if a country's last default was in year $t-1$ (DEF1YEAR); a dummy variable taking a value of one if a country's last default was in year $t-2$ (DEF2YRS); a dummy variable taking a value of one if a country's last default was between year $t-3$ and year $t-5$ (DEF3 5YRS); a dummy variable taking a value of one if a country's last default was between year $t-6$ and year $t-10$ (DEF6 10YRS); and a dummy variable taking a value of one if a country's last default was between year $t-11$ and year $t-25$ (DEF11 25YRS; The excluded dummy is the one for countries that defaulted before year $t-25$ or never defaulted); credit rating (RATING); and the residual of a rating regression that includes all the control variables (excluding default history) used in Table 4 (RATING RES). Absolute value of *z*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

ratings the effect on spreads becomes even more short-lived. This is probably due to the fact that part of the reputational cost of default is reflected in lower ratings. (Panizza, Sturzenegger, and Zettelmeyer, forthcoming, use a slightly different specification and confirm this result.)

In columns 7 and 8, we substitute residual ratings with actual ratings and again find similar results.

IV. Default and International Trade

While the idea that defaults may lead to some form of trade retaliation has been around for a long time (see, for instance, Díaz-Alejandro, 1983), the empirical evidence on a link between default and trade is much more recent. Rose (2005) tests the hypothesis that defaults have a negative effect on trade by including an indicator variable for Paris Club debt renegotiations in a standard gravity trade model that uses bilateral trade data covering 200 countries over the 1948–97 period. He finds that Paris Club debt renegotiations are associated with a decline in bilateral trade that lasts for 15 years and amounts to approximately 8 percent per year.[26] In Borensztein and Panizza (2006), we use industry-level data and find that sovereign defaults are particularly costly for export-oriented industries. However, unlike Rose (2005) we find that the effect of default on exports tends to be short-lived. One question that is not addressed by either Rose (2005) or Borensztein and Panizza (2006) concerns the channel through which default affects trade.

In principle, the reduction in trade following a debt default could come from restrictive measures imposed by the country of residence of the investors. This is the assumption often made by the theoretical debt literature. However, there is little historical record of countries imposing quotas or embargos on a country that falls in default. The current structure of international capital markets, where investors are increasingly anonymous bondholders who may switch from long to short positions in minutes, makes this traditional assumption more implausible nowadays. There is, however, a more likely scenario. The deterioration in the credit quality of exporting firms after the default (that results from the risk of imposition of capital or exchange controls) could make trade credit less available and more expensive. This would, in fact, have consequences similar to those of retaliatory measures. This is precisely the idea of Kohlscheen and O'Connell (2007) who build a model of sovereign debt in which trade credit reduces the transaction costs associated with international trade and defaults are costly because they lead to a collapse in trade credit.[27] They look at 12 default episodes that took place between 1992 and 2001 and show that 11 of these episodes were followed by a collapse in trade credit much larger than the

[26]See also Martinez and Sandleris (2008).

[27]Kohlscheen and O'Connell (2007) accumulation of international reserves is justified by the fact that, by allowing countries to survive without trade credit, reserves put defaulters in a stronger bargaining position during the renegotiation of defaulted debt.

collapse in trade (the exception is Ivory Coast in 2000).[28] In the sample of Kohlscheen and O'Connell (2007), the median reduction of trade credit was 35 percent two years after the default, and 51 percent four years after the default. However, Kohlscheen and O'Connell do not provide a formal econometric test of the relationship between default and trade credit, which is what we attempt in this section.

We study the relationship between default and trade credit using Organization for Economic Development and Cooperation (OECD) data on net trade credit extended by OECD countries to developing countries and economies in transition. According to the OECD definition, trade credit measures loans for the purpose of trade which are not represented by a negotiable instrument. One problem with the OECD data set is that it only includes loans issued or guaranteed by the official sector and hence it may underestimate total trade credit. With this caveat in mind, we test the trade credit channel using and unbalanced panel to estimate the following equation:

$$NTC_{i,t} = \alpha DEFAULT_{i,t} + \beta X_{i,t} + \mu_i + \varepsilon_{i,t}, \tag{4}$$

where $NTC_{i,t}$ is net trade credit (new trade credit flows minus repayments) scaled by international trade (measured as exports plus imports) in country i in year t, $DEFAULT_{i,t}$ is a default dummy that takes a value of one if country i is in default in year t, $X_{i,t}$ is a set of controls (X includes log inflation, log GDP, the change in terms of trade, the change in the real exchange rate, a variable measuring the level of democracy, and lagged trade), and μ_i is a set of country fixed effects (we also experimented with year fixed effects and our results were unchanged).[29] We scale trade credit by trade to implicitly control for the decline in trade associated with defaults. Expressing trade credit as a share of total trade allows an interpretation of the coefficients of the regressions which is similar to the concept of elasticity. For instance, a negative value of α indicates that default episodes lead to a decrease in trade credit greater than the overall decline in trade.[30]

We start by estimating our baseline model and find that the default dummy has a negative and statistically significant effect on trade credit (column 1 of Table 6). In column 2, we explore the dynamic effect of default by augmenting the model with two dummies that take a value of one in the first and second year of the default episode (*DEF_EP* take value one in the first year of the default episode and *DEF_EP1* is a one-year lag of *DEF_EP*).

[28]There exists some evidence on the relationship between currency crisis and trade credit. Love and Zaidi (2004) and World Bank (2004) find that, in the case of East Asia, the 1997 crisis had a negative impact on trade credit, albeit smaller than that on total bank lending.

[29]In order to make sure that our results are not driven by outliers, we dropped all observations for which the dependent variable had a z-score greater than 5.

[30]In particular: $\alpha = \left(\frac{C_d}{C} - \frac{T_d}{T}\right)\frac{C}{T}$ (where C is trade credit and T trade, C_d and T_d measure the effect of default on trade and trade credit). See Love, Preve, and Sarria-Allende (2005) for a similar interpretation.

Table 6. Default and Trade Credit

	(1) NEC	(2) NEC	(3) NEC	(4) NEC	(5) NEC	(6) NEC
Estimation Method	Fixed Effects				Arellano and Bond	
DEFAULT	−0.800	−0.800	−0.800	−0.900	−0.134	0.011
	(5.85)***	(5.74)***	(5.95)***	(5.85)***	(4.88)***	(0.39)
LINF	0.000	0.000	0.000	0.000	−0.032	−0.038
	(0.14)	(0.21)	(0.11)	(0.17)	(7.51)***	(10.24)***
LGDP	0.600	0.600	0.400	0.400	0.007	−0.029
	(2.72)***	(2.72)***	(1.53)	(1.55)	(0.08)	(0.34)
DTOT	0.000	0.000	0.100	0.100	−0.599	−0.533
	(0.12)	(0.03)	(0.38)	(0.28)	(9.53)***	(7.92)***
DRER	−0.100	−0.100	−0.300	−0.300	−0.266	−0.259
	(1.74)*	(1.73)*	(2.50)**	(2.50)**	(4.78)***	(4.69)***
DEMOC	0.000	0.000	0.000	0.000	0.011	0.012
	(1.31)	(1.42)	(1.13)	(1.26)	(14.99)***	(17.32)***
DEF_EP		0.500		0.500		−0.439
		(1.75)*		(1.76)*		(8.10)***
DEF_EP1		−0.400		−0.400		−0.449
		(1.40)		(1.35)		(6.87)***
TRADE_1			0.300	0.300	0.337	0.300
			(1.31)	(1.28)	(7.20)***	(4.92)***
NEC_1					7.296	7.911
					(37.68)***	(36.16)***
Constant	−14.200	−14.200	−16.700	−16.500	−0.008	0.002
	(2.70)***	(2.70)***	(2.94)***	(2.92)***	(0.80)	(0.26)
Observations	1,060	1,060	1,059	1,059	872	872
Number of cc	99	99	99	99	96	96
R-squared	0.07	0.07	0.07	0.07		

Note: This table shows the results of a set of regressions where the dependent variable measures is net trade credit (new trade credit flows minus repayments) scaled by international trade (measured as exports plus imports) in country *i* in year *t*. The explanatory variables are a dummy variable that takes a value of one if the country is in default in year *t* (DEFAULT); log inflation (LINF); log GDP (LGDP), change in terms of trade (DTOT); change in the real exchange rate (DRER); and index of democracy (DEMOC); a dummy variable that takes a value of one in the first year of a default episode (DEF_EP); the lagged value of DEF_EP (DEF_EP1), lagged trade over GDP (TRAD_1) and lagged trade credit (NEC_1). Absolute value of *t*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

We find that the effect of default is smaller in the first year of the default episode (this is probably due to the fact that defaults do not always happen at the beginning of the year) and larger (although the coefficient is not statistically significant) in the second year. In columns 3 and 4, we control for lagged trade and find that including this variable does not affect our baseline estimates.

There are at least two problems with the estimations of columns 1 to 4. Fist, they do not allow for persistence in the left-hand side variable. Second, they do not recognize that most variables included in the model are endogenous. Columns 5 and 6 deal with these issues by using the Arellano and Bond (1991) GMM difference estimator which allows to consistently estimate a fixed effect model that includes the lagged dependent variable. Under certain conditions, this class of general method of moments (GMM) estimators also allows to deal with endogeneity by instrumenting the explanatory variables with their lagged values. Column 5 replicates the model of column 3 adding the lagged dependent variable and using the Arellano and Bond estimator. We find that the coefficient of the default dummy remains negative and statistically significant but drops from –0.8 to –0.13. Column 6 reproduces the model of column 4 adding the lagged dependent variable and using the Arellano and Bond (1991) estimator. In this case, we find that the effect is negative and large only in the first and second year of the default. This result suggests that default does have a negative effect on trade credit but that this effect is short-lived.[31] Moreover, it is not clear whether default episodes affect trade credit more than other forms of credit. Arteta and Hale (2008) use firm-level data and suggest that this is not the case. In particular, they find that sovereign defaults reduce foreign credit access to nonexporters more than to exporters.

To probe the issue further, we run a set of regressions in which we look at whether controlling for trade credit affects the relationship between default and bilateral trade. Formally, we estimate the following gravity model:

$$LTR_{i,j,t} = \mu_{i,j} + \gamma X_{i,j,t} + \alpha DEF\_NS_{i,j,t} + \beta TC\_NS_{i,j,t} + \varepsilon_{i,j,t}, \tag{5}$$

where $LTR_{i,j,t}$ is the log of bilateral trade between country i and country j at time t, $\mu_{i,j}$ is a country pair fixed effect and $X_{i,j,t}$ is a set of controls.[32] $DEF\_NS_{i,j,t}$ is a dummy variable that takes value one if in year t either country i or country j is in default (as usual, we measure default using Standard and Poor's data) and the i, j pair consists of a developing and industrial country. This strategy, which is similar to the one used by Rose (2005) in his robustness analysis (Table 4 in Roses' paper), assumes that if there is some retaliation for default that operates through trade credit, this retaliation should mainly affect trade between high-income and low-income countries because the former are the likely creditors. $TC\_NS_{i,j,t}$ measures

[31]Note that our data for trade credit only cover suppliers of trade credit based in the OECD countries. If a default were to cause a diversion of trade towards non-OECD countries (a fact consistent with Rose's finding), we would be interpreting a change in trade credit pattern as a reduction in credit.

[32]We use the same set of controls used by Rose (2005) in his fixed effect regressions (log of total GDP, log of GDP per capita, regional trade agreement dummy, colony dummy, and currency union dummy) but also augment the regressions with a variable measuring default interacted with average trade between country i and country j.

total trade credit received by the developing country in the pair. In particular, when one of the two countries in the pair is a developing country and the other is an industrial country, $TC\_NS_{i,j,t}$ is set to be equal to the log of the stock of official trade credit received by the developing country in year t, and it takes value 0 if the i, j pair consists of either two industrial countries or two developing countries.

Although trade credit is endogenous with respect to trade, and β should not be given any causal interpretation and only interpreted as the correlation between $TC\_NS_{i,j,t}$ and $LTR_{i,j,t}$, this exercise is interesting because if it were true that the effect of default operates through trade credit, we should find that controlling for trade credit should reduce the correlation between default and trade.

In column 1 of Table 7, we reproduce the basic result of Rose (2005) and show that defaults are associated with a large and statistically significant decline in bilateral trade flows between advanced and emerging or developing economies. In column 2, we assume that country pairs with large, well-established trade relationships should be able to cope better with disruptions arising from default episodes, and control for this possibility by augmenting the regression with a variable that interacts the default dummy with the log of average trade between country i and j (DEF_AVT, where the average is measured using all periods for which data are available).

As expected, we find that DEF_AVT has a positive and statistically significant coefficient and that including this variable in the regression increases the point estimates of DEF_NS. In column 3, we estimate the same model of column 2 but restrict the sample to be the same to the one for which we have data on trade credit. Qualitatively, the results are unchanged. In particular, DEF_NS remains negative and statistically significant. Quantitatively, the impact of default is much smaller in the restricted sample.[33]

In column 4, we augment the regression with $TC\_NS_{i,j,t}$ and measure trade credit with the log of the total stock of trade credit to country i (where country i is the developing country in the pair) in year t. As expected, this variable is positive and statistically significant. It is also quantitatively important indicating that the elasticity of trade to trade credit is approximately 7 percent. While this coefficient cannot be interpreted in terms of causality, what is interesting is that controlling for trade credit does not affect the relationship between default and trade. In particular, the coefficients of DEF_NS and DEF_AVT in column 4 are identical to those of column 3. Columns 5 and 6 repeat the experiment by focusing on total nonbank trade credit and total bank trade credit. The results are basically unchanged.

[33]Running these regressions using imports as the trade measure yields less significant results (not shown here).

Table 7. Default and Trade: Does Trade Credit Matter?

	(1) LTR	(2) LTR	(3) LTR	(4) LTR	(5) LTR	(6) LTR
DEF_NS	−0.206	−0.319	−0.054	−0.054	−0.047	−0.104
	(16.46)***	(25.21)***	(1.68)*	(1.66)*	(1.47)	(3.00)***
LGDP	0.315	0.353	0.393	0.393	0.393	0.392
	(40.18)***	(45.03)***	(38.75)***	(38.76)***	(38.73)***	(38.39)***
LGDP_PC	0.323	0.262	0.145	0.144	0.145	0.149
	(27.51)***	(22.28)***	(9.75)***	(9.70)***	(9.75)***	(9.93)***
RTA	0.108	0.104	0.179	0.179	0.179	0.178
	(13.28)***	(12.86)***	(15.77)***	(15.76)***	(15.75)***	(15.62)***
CURCOL	0.332	0.388	−0.095	−0.096	−0.095	−0.091
	(3.80)***	(4.46)***	(0.38)	(0.38)	(0.38)	(0.36)
CUSTRICT	0.669	0.665	0.647	0.647	0.647	0.647
	(13.39)***	(13.38)***	(10.21)***	(10.21)***	(10.21)***	(10.15)***
DEF_AVT		0.141	0.176	0.176	0.176	0.178
		(47.37)***	(44.87)***	(44.87)***	(44.84)***	(44.88)***
LTC_TOTNS				0.073		
				(4.55)***		
LTC_NBNKNS					0.055	
					(3.59)***	
LTC_BNKNS						0.037
						(3.29)***
Constant	−10.215	−11.02	−11.338	−11.41	−11.392	−11.38
	(46.75)***	(50.53)***	(37.59)***	(37.78)***	(37.71)***	(37.39)***
Observations	234,457	234,457	151,371	151,371	151,243	147,057
Number of country pairs	12,150	12,150	11,885	11,885	11,883	11,687
R-squared	0.11	0.12	0.08	0.08	0.08	0.08

Note: This table shows the results of a set of gravity regressions where the dependent variable is the log of bilateral trade between country *i* and country *j* at time *t* (LTR) and the explanatory variables are a dummy variable that takes value one if one of the two countries is in default and the pair contains an advanced and a developing country (DEF_NS); the product of the log of GDP of the two countries (LGDP); the product of the log of GDP per capita of the two countries (LGDP_PC); a dummy variable that takes a value of one for pair of countries that are in a regional trade agreement (RTA); a dummy variable for colonies (CURCOL); a dummy variable for countries that belong to a currency union or use the same currency (CUSTRICT); average trade between the two countries (DEF_AVT); total trade credit received by the developing country in the pair (LTC_TOTNS); total nonbank trade credit received by the developing country in the pair (LTC_NBNKNS); and total bank trade credit received by the developing country in the pair (LTC_BNKNS). Absolute value of *t*-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

V. Default and the Domestic Banking System

Sovereign defaults affect not only external creditors but also domestic bondholders. Although data on the breakdown of bondholders by country of residence is scant, some recent default events suggest that domestic residents tend to account for a sizable portion of the holdings, perhaps a majority in

some cases. This means that a sovereign default can have serious consequences for the domestic private sector. In particular, when domestic banks hold large amounts of government debt, the domestic financial sector may be put under significant stress by the default (Beim and Calomiris, 2000; Sturzenegger and Zettelmeyer, 2006).

Our strategy is to test if sovereign defaults lead to banking crises or a domestic credit crunch. This may happen for several reasons. First of all, default episodes may cause a collapse in confidence in the domestic financial system and may lead to bank runs, resulting in banking crises or at least a credit crunch. Second, even in the absence of a bank run, default episodes would have a negative effect on banks' balance sheet, especially if holdings of the defaulted article are large, and lead banks to adopt more conservative lending strategies. Finally, default episodes are often accompanied by a weakening of creditor rights or at least more uncertainty about them, which may also have a negative effect on bank lending.

To investigate the possible effect of sovereign defaults on banking crises, we build an index of banking crises using data from Glick and Hutchinson (2001), Caprio and Kingelbiel (2003), and Dell'Ariccia, Detragiache, and Rajan (2005).[34] Our data include 149 countries for the 1975–2000 period and 3,874 observations. In this sample, there are 111 banking crises (yielding an unconditional probability of observing a crisis of 2.9 percent) and 85 default episodes (yielding an unconditional probability of observing a default of 2.2 percent). In order to check whether defaults predict currency crisis, we compute the probability of having a banking crisis in year t conditional on having a debt default in year t or year $t-1$ (this is similar to the test in Kaminsky and Reinhart, 1999). The results indicate that the probability of having a banking crisis conditional on default is 14 percent, an 11 percentage point increase with respect to the unconditional probability (Table 8). The statistical significance of the difference between conditional and unconditional probability is quite high.

As banking crises tend to involve large fiscal costs, it is also possible that the direction of causality is reversed, namely that banking crises cause default episodes. However, the probability of a default conditional on having a banking crisis is only two percentage points higher than the unconditional probability, and the difference is not statistically significant at conventional confidence levels. These results should be taken with an appropriate degree of caution because we have relatively few cases of "twin" crisis and, as we work with annual data, we lose some precision in the measure of the relative timing of banking crises and default episodes. However, the results suggest that default episodes may increase the probability of a banking crisis much more than the other way round.

[34]We code a country-year as a banking crisis if one of the following conditions apply: either Glick and Hutchinson (1999) define the episode as a major banking crisis, or Caprio and Klingebiel (2003) define the episode as a systemic crisis, or the country year is included in the list in Dell'Ariccia, Detragiache, and Rajan (2005).

Table 8. Probabilities of Default and Banking Crisis

Unconditional probability of a banking crisis (111 episodes)	2.9
Probability of a banking crisis conditional on a default	14.1
P-value on a test P(BC/DEF) > P(BC)	0.0
Unconditional probability of a sovereign default (85 episodes)	2.2
Probability of a default conditional on a banking crisis	4.5
P-value on a test P(DEF/BC) > P(DEF)	0.1

Sources: Authors' calculations based on data from Glick and Hutchinson (2001); Caprio and Kingelbiel (2003); and Dell'Ariccia, Detragiache, and Rajan (2005).

Note: The top panel of the table shows the unconditional probability of banking crises (measured as the number of banking crises divided by number of observations in the sample) and the probability of a banking crisis conditional on a default (measured as the number of banking crises in the first or second year of a default episode divided by number of default episodes times two). The bottom panel of the table shows unconditional and conditional probabilities of a default episode (conditional and unconditional probabilities are calculated using the same methods used in the top panel of the table).

To test whether default episodes generate a credit crunch, we use a methodology similar to the one originally developed by Rajan and Zingales (1998), and recently applied by Dell'Ariccia, Detragiache, and Rajan (2005) to investigate the cost of banking crises. The basic idea is to use data at the industry level to test whether defaults have a larger negative impact on sectors that require more external finance.

Following Dell'Ariccia, Detragiache, and Rajan (2005), we pose the following specification:

$$VAGR_{i,j,t} = a_{i,j} + b_{i,t} + c_{j,t} + \alpha SHVA_{i,j,t-1} + \beta DEF_{i,t} * EXT_j + \varepsilon_{i,j,t}, \quad (6)$$

The dependent variable in equation (6) measures real value added growth for industry j in country i at time t. The controls comprise a set of country-industry fixed effects ($a_{i,j}$), a set of country-year fixed effects ($b_{i,t}$), a set of industry-year fixed effects ($c_{i,t}$), and the lagged ratio of sector j's value added over total manufacturing production ($SHVA$). Fixed effects control for country-specific, industry-specific, and time-invariant country-industry specific shocks, and hence capture most of the factors that are likely to affect the performance of a given industry and greatly attenuate omitted variable biases. $SHVA$ controls for convergence and mean reversion (possibly due to errors in variables). Our variable of interest is the interaction between a default dummy (DEF) and the index of external financial dependence (EXT) assembled by Rajan and Zingales (1998) and later used by Dell'Ariccia, Detragiache, and Rajan (2005).[35]

In the above setup, β measures whether value added growth in sectors that require more external financing is affected differentially by default

[35]Note that the definition of external-finance-dependent industries is based on data for advanced economies.

Table 9. Default and Industry Value-Added Growth

	(1) VAGR	(2) VAGR	(3) VAGR	(4) VAGR	(5) VAGR
DEF × EXT	0.009	0.021	0.009	0.019	
	(0.74)	(1.41)	(0.73)	(1.30)	
DEF_b × EXT		−0.027		−0.022	
		(1.22)		(0.99)	
DEF_b1 × EXT		−0.033		−0.031	
		(1.51)		(1.42)	
DEF_b2 × EXT		−0.013		−0.013	
		(0.60)		(0.61)	
SHVA	−1.251	−1.25	−1.253	−1.252	−1.253
	(15.18)***	(15.17)***	(15.21)***	(15.19)***	(15.21)***
BK_CR × EXT			−2.277	−2.164	−2.282
			(2.29)**	(2.16)**	(2.29)**
Constant	0.154	0.152	0.157	0.156	0.3
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	15,872	15,872	15,872	15,872	15,872
R-squared	0.46	0.46	0.46	0.46	0.46

Note: This table shows the results of a set of regressions where the dependent variable is value-added growth in industry *j*, country *i* at time *t*. The explanatory variables are country-year fixed effects; industry-year fixed effects; country-industry fixed effects; a dummy variables that takes a value of one if the country is in default interacted with the industry-level Rajan and Zingales index of dependence on external finance (DEF × EXT); a dummy variables that takes a value of one in the first year of a default episode interacted with the industry-level Rajan and Zingales index of dependence on external finance (DEF_b × EXT; DEF_b1 and DEF_b2 are the first and second lags of DEF_b); the lagged share of the value added of industry *j* over total valued added in country *i* at time *t*−1. (SHVA); and a dummy variables that takes a value of one during banking crises interacted with the industry-level Rajan and Zingales index of dependence on external finance (BK_CR × EXT). Absolute value of *t*-statistics in parentheses. All regressions exclude top and bottom 5 percent observations in the dependent variable.

episodes. A negative value of β would provide evidence in support of the hypothesis that default episodes lead to a credit crunch in the banking sector.

The results of estimating this model, reported in Table 9, do not provide much support for the credit crunch hypothesis.[36] In column 1, we focus on all the years in which the country is in default (*DEF*). The coefficient has the wrong (positive) sign, although it is not statistically significant. In column 2, we use three dummy variables taking a value of one in the first, second and third year of a default episode, and find that these variables tend to have the

[36]We use the same sample restriction used in Dell'Ariccia, Detragiache, and Rajan (2005). In particular, we focus on the 1980–2000 period and restrict the sample to all the countries that observed at least a banking crisis or a default over this period. We drop from the sample the top and bottom 5 percent of observations. The last column of Table 10 uses a specification that is identical to the one used by Dell'Ariccia, Detragiache, and Rajan (2005) and obtains results which are similar (although not identical) to those obtained by those authors.

right (negative) sign but that they are never statistically significant (neither individually nor jointly). In columns 3 and 4, we augment the regressions of columns 1 and 2 with the interaction between banking crisis and external dependence (the same variable used by Dell'Ariccia, Detragiache, and Rajan, 2005) and find that our results are unchanged. We conclude that, unlike banking crises, defaults do not seem to have a special effect on industries that depend more on external finance.

VI. Political Implications of Default

Sometimes, politicians and bureaucrats seem to go to a great length to postpone what seems to be an unavoidable default. In the case of Argentina, for instance, it is reported that even Wall Street bankers had to work hard to persuade the policymaking authorities to accept reality and initiate a debt restructuring (Blustein, 2005). Why the reluctance? There seems to be evidence that defaults do not bode well for the survival in office of finance ministers and the top executive politicians.

High political costs have two important implications. On the positive side, a high political cost would increase the country's willingness to pay and hence its level of sustainable debt. On the negative side, politically costly defaults might lead to "gambles for redemption" and possibly amplify the eventual economic costs of default if the gamble does not pay off and results in larger economic costs. Delaying default might be costly for at least three reasons: (1) noncredible restrictive fiscal policies are ineffective in avoiding default and lead to output contractions; (2) delayed defaults may prolong the climate of uncertainty and high interest rates and thus have a negative effect on investment and banks' balance sheets; and (3) delayed default may have direct harmful effects on the financial sector.[37]

This suggests that a politician concerned about his/her political survival faces a tradeoff that is somewhat different from the one affecting the country itself, say, the representative citizen.

This contrast can be illustrated in a simple formal framework as follows.[38]

Assume that a country is entering a period of crisis and the policymaker needs to decide whether to default now or attempt to implement some sort of emergency program with a small chance of success. The social cost of current default is D_0. If the measures are successful (with probability $\prod$) there will be no future default (and hence no cost), but if the measures are not successful there will be a delayed default with a cost of D_1 (with $D_1 > D_0$). Hence, trying to avoid default is optimal if and only if $D_0 > (1-\prod)D_1$. This inequality can

[37]This might happen for at least two reasons. Firstly, in the attempt to avoid default, banks might be forced to increase their holdings of government bonds, which later collapse in value, and secondly, the climate of uncertainty and the weakening of the banks' financial position may trigger a deposit run.

[38]This framework is inspired in Sturzenegger and Zettelmeyer (2006, Chapter 11).

be rewritten as

$$\Pi > \frac{D_1 - D_0}{D_1},$$

implying that trying to avoid default is socially optimal only if the probability of success is greater than the percent difference between the cost of defaulting today and the cost of defaulting in the future (we assume zero discount rate).

It is now interesting to ask how self-interested politicians can lead to a deviation from the social optimum. Let us assume that the default decision is made by a policymaker who obtains a rent from being in power and that this policymaker knows that in case of default he/she will lose his/her job with probability θ. Let us assume that the policymaker's objective function is to maximize his/her own utility function, which is given by $U = (1-\Phi)R + \Phi W$, where R represents the rents from being in power, W is a measure of social welfare, and Φ ($0 \leq \Phi \leq 1$) is the weight that the politician puts on social welfare. In this setup, the politician will decide to attempt to avoid default if:

$$(1 - \Phi)R\vartheta(1 + \vartheta) - \Phi D_0 < (1 - \Phi)R(1 + \Pi)$$

$$+ (1 - \Pi)((1 - \Phi)\vartheta R - \Phi D_1),$$

where $\vartheta = (1-\theta)$. This inequality can be rewritten as:

$$\Pi > \frac{D_1 - D_0}{D_1} - \frac{R(1 - \Phi)}{\Phi D_1}(1 + \Pi - \vartheta(\Pi + \vartheta)). \tag{8}$$

This inequality implies that politicians who are altruistic (meaning $R = 0$, or equivalently, $\Phi = 1$) will just maximize social welfare, which is given by the first term of the right-hand side.

The same happens if defaults are not politically costly (that is when $\theta = 0$ and $\vartheta = 1$). However, in the presence of politically costly defaults, politicians who care about their own careers (that is, politicians with $R > 0$ and $\Phi < 1$) will try to delay default even when that is detrimental to social welfare. In fact, the above equation suggests that politicians who do not care about social welfare ($\Phi = 0$) will try to postpone default even if the probability of success is zero.

There is no empirical literature on the political costs of default, but there exists a related literature on the political cost of sharp devaluations. In particular, Cooper (1971) was the first to illustrate the political cost of devaluations by showing that devaluations more than double (from 14 to 30 percent) the probability of a political crisis and a government change within the next 12 months. Frankel (2005) updates Cooper's (1971) data and finds that over the 1971–2003 period devaluations increased the probability of a change in the chief of the executive in the following 12 months by approximately 45 percent (from 20 to 29 percent).[39] Frankel (2005) also

[39]The impact of the crisis is even higher when the window is restricted to six months. In this case the probability of a change in the executive goes from 12 to 23 percent, an increase of nearly 100 percent.

checked whether devaluations affect the probability of a change of the minister of finance or governor of the central bank (whoever held the position of governor of the IMF) and found that devaluations are associated with a 63 percent increase in the probability of replacement of this official (from 36 to 58 percent).

Applying a similar methodology, we find that defaults have a broadly similar political cost. Table 10 lists all democracies that defaulted over the 1980–2003 period.[40] The table also reports the share of votes of the ruling coalition in the elections that preceded and followed the default. Of 19 countries for which we have data on electoral results before and after defaults, we find that the ruling coalitions lost votes in 18 countries (the exception is Ukraine). We also find that, on average, ruling governments in countries that defaulted observed a 16 percentage point decrease in electoral support, and that in 50 percent of the cases (11 of 22 episodes) there was a change in the chief of the executive either in the year of the default episode or in the following year. This is more than twice the probability of a change of the chief of the executive in normal times reported by Frankel (2005).

We also investigate changes in the top economic officials by looking for changes in the country's IMF governor (who is typically the finance minister but in some cases the governor of the central bank). The first column of the upper panel of Table 11 shows that in tranquil years there is a 19.4 percent probability of observing a change of the IMF governor, but after a default, the probability jumps to 26 percent (the difference is statistically significant with a *p*-value of 0.04). Interestingly, defaults on bank loans do not seem to matter (column 2) but bond defaults are particularly perilous for finance ministers. In the latter case, the probability of turnover more than doubles to over 40 percent. To check for the possibility that our results are driven by changes in political and economic institutions (for example, an increase in the ease of government turnovers), we split the sample into two subperiods. Interestingly, we do not find large differences between the two subperiods and, if anything, find that defaults seemed to have a higher political cost in the 1980s than in the 1990s. The second panel of the table uses an 18-month window to measure turnover. The results are similar to those of upper panel, but here the impact of bond defaults is even more dramatic, with more than 90 percent of finance ministers losing their job in the 18 months following a default episode (the turnover in tranquil times is 47 percent using this extended window).

In Table 12, we divide the sample according to the political regime, between dictatorships and democracies. Somewhat surprisingly, we find that the political cost of defaulting on bank loans is higher in dictatorships but the

[40]The table does not include dictatorships or countries that were transitioning towards democracy at the time of default.

Table 10. Defaults and Elections

	Year of Default	Election before Default		Election before Default		Change in Votes	Change in the Chief Executive
		Year	Votes	Year	Votes		
Argentina	2001	1999	37.50	2003	16.90	–20.60	Yes
Bolivia	1989	1985	26.42	1989	19.64	–6.78	Yes
Costa Rica	1981	1978	39.66	1982	25.79	–13.87	Yes
Costa Rica	1983	1982	45.03	1986	41.73	–3.30	
Dominican Republic	1982	1978	37.47	1982	32.85	–4.62	Yes
Ecuador	1982	1979	18.25	1984	8.31	–9.94	
Ecuador	1999	1998	18.98	2002	NA	NA	Yes
Guatemala	1989	1985	23.56	1990	8.48	–15.08	
Jamaica	1981	1980	40.67	1983	0.00	–40.67	
Jamaica	1987	1983	89.86	1989	43.32	–46.54	
Moldova	1998	1996	NA	2000	NA	NA	Yes
Paraguay	2003	1998	43.29	2003	23.88	–19.41	Yes
Peru	1980	1980	27.71	1985	5.65	–22.06	Yes
Peru	1984	1980	27.71	1985	5.65	–22.06	Yes
Trinidad and Tobago	1988	1986	NA	1992	NA	NA	
Ukraine	1998	1994	21.55	1999	25.60	4.05	
Uruguay	1987	1984	35.39	1989	25.74	–9.65	
Uruguay	1990	1989	33.03	1994	27.18	–5.85	Yes
Uruguay	2003	1999	29.30	2004	9.11	–20.19	
Venezuela	1983	1978	39.96	1983	27.85	–12.11	Yes
Venezuela	1990	1988	42.23	1993	13.69	–28.54	
Venezuela	1995	1993	13.18	1998	0.00	–13.18	

Sources: Inter-American Development Bank, *Democracies in Development*; and International Parliamentary Union: www.ipu.org/parline-e/parlinesearch.asp.

Note: The last column of the table lists all the cases in which the chief of the executive changed in the year of the default or in the year after the default. Column (f) shows the change in votes (measured in percentage points) received by the ruling part in the first election after the default episode (this is equal to (c)-(e)). Column (g) lists all the cases in which the chief of the executive changed in the year of the default or in the year after the default.

cost of defaulting on sovereign bonds is higher in democracies. When we pull all defaults together, we find a higher turnover of economic policymakers in dictatorships. This may suggest that dictators find it easier to blame and fire their minister of finance. The second panel shows that using 18-month windows does not affect the basic finding described above.

While the patterns described above are consistent with the presence of a political cost of default, defaults tend to happen in periods of economic and political turmoil and the correlation between default episodes and the dismissal of top economic officials could be driven by a common shock (for instance, a negative output shock). We are well aware of this problem (which,

Table 11. Default and the Probability of Replacing the Minister of Finance by Type of Default

Probability of Replacing the Minister of Finance	All Defaults	Defaults on International Bank Loans	Defaults on Sovereign Bonds	All Defaults 1977–89	All Defaults 1990–2004
			One year later		
Tranquil years	19.40	19.50	19.50	17.80	20.70
After a default	25.70	24.20	40.00	24.60	28.60
Difference	6.40	4.60	20.50	6.80	7.90
P-value	0.04	0.16	0.01	0.07	0.18
			18 months later		
Tranquil years	47.30	47.40	47.40	43.30	50.90
After a default	57.70	55.60	92.30	55.10	64.40
Difference	10.40	8.20	44.80	11.80	13.50
P-value	0.01	0.05	0.00	0.01	0.07

Sources: IMF, *Annual Report,* various issues; and authors' calculations.

Note: All the *p*-values refer to a two-tails test. This table shows the probability of replacing the Minister of Finance in tranquil years and in years that follow a default episode.

in fact, is also present in the analyses of Cooper, 1971; and Frankel, 2005) and thus we make no claim of causality.[41]

The previous discussion emphasized that the political cost of default may decrease social welfare because it generates incentives to gamble for redemption. However, the presence of political costs may also have a positive effect on social welfare because, like all other costs of default, it provides incentives to repay and thus increases the level of sustainable debt. This is exactly the channel emphasized by the political science literature on "leader-specific punishment." In particular, McGillivray and Smith (2000, 2004, 2005, 2006) show that, if leaders are replaceable, punishment targeted against individual politicians increases the probability of international cooperation. In this setup, defaulters may be punished only as long as the leader that defaulted remains in power. Thus, from the country's point of view, it would be optimal to default and immediately replace the leader. Knowing this, the leader will do his or her best not to default. Rose and Spiegel (2007) provide some evidence that countries willing to cooperate on noneconomic relationships (such as environmental treaties) are also more likely to cooperate on economic relationships. There are cases, however, in which the domestic-audience cost may have exactly the opposite effect and provide politicians with incentives to repudiate external debt. For instance,

[41]This is why we did not attempt to estimate a formal econometric model but just showed that the well-known result that sharp devaluations may be politically costly also applies to episodes of sovereign default.

Table 12. Default and the Probability of Replacing the Minister of Finance by Type of Default and Government

Probability of Replacing the Minister of Finance	Defaults on International Bank Loans	Defaults on International Bank Loans	Defaults on Sovereign Bonds	Defaults on Sovereign Bonds	All Defaults	All Defaults
	Democracies	Dictatorships	Democracies	Dictatorships	Democracies	Dictatorships
			One year later			
Tranquil years	21.90	17.60	21.70	18.00	21.80	17.50
After a default	23.30	27.00	44.40	33.30	24.70	28.70
Difference	1.40	9.40	22.70	15.30	2.80	11.20
P-value	0.79	0.04	0.02	0.17	0.54	0.01
			18 months later			
Tranquil years	51.10	44.90	50.60	45.50	50.80	44.80
After a default	53.50	60.80	94.40	87.50	57.00	61.50
Difference	2.40	15.90	43.80	42.00	6.20	16.70
P-value	0.69	0.00	0.00	0.00	0.29	0.00

Sources: IMF, *Annual Report,* various issues; Alvarez and others (1999); and authors' calculations.

Note: This table shows the probability of replacing the Minister of Finance in tranquil years and in years that follow a default episode. The data are organized by type of government (democracies versus dictatorships). All the *p*-values refer to a two-tails test.

Tomz (2002) argues that the domestic-audience effect prevented Argentina from defaulting in 1999 but had the opposite effect in 2001. It is also plausible that the recent partial default of Ecuador was motivated to some extent by domestic-audience pressure.

VII. Conclusions

This paper has investigated the empirical basis of the costs of sovereign defaults in its different versions. Table 13 provides a synthesis of the results presented in a way which may be useful to authors who need evidence on the various costs of default in order to calibrate theoretical models. The findings suggest that default costs are significant, but short-lived. Reputation of sovereign borrowers that fall in default, as measured by credit ratings and spreads, is tainted, but only for a short time. While there is some evidence that international trade and trade credit are negatively affected by episodes of default, we could not trace it to the volume of trade credit, as the default literature suggests. Debt defaults seem to cause banking crises, and not vice-versa, but we found weak evidence to suggest the presence of default-driven credit crunches in domestic markets. Finally, defaults seem to shorten the life expectancy of governments and officials in charge of the economy in a significant way.

The results suggest that default costs remain somewhat vaguely defined, and difficult to quantify. On the positive side, we found a fairly sensible estimate of the effect on credit ratings and bond spreads, and we call attention to the sharp increase in government turnovers following debt crises. On the negative side, the result regarding how international trade credit affects the link between trade and default and the finding that default episodes do not appear to affect bank lending do not seem to be very plausible. Perhaps the most robust and striking finding is that the effect of defaults is short-lived, as we almost never can detect effects beyond one or two years.

A relatively unexplored avenue is the decision-making process of policymakers concerning the timing of defaults (see, however, Alichi, 2008). Defaults tend to be widely anticipated and happen at times when the domestic economy is quite weak. This may happen for two widely different reasons. Self-interested policymakers may try postponing defaults even at increasing economic cost, as the evidence presented in this paper suggests a clearly higher political turnover following a debt default. A different possibility is that policymakers postpone default to ensure that there is broad market consensus that the decision is unavoidable and not strategic. This would be in line with the model in Grossman and Van Huyck (1988) whereby "strategic" defaults are very costly in terms of reputation—and that is why they are never observed in practice—while "unavoidable" defaults carry limited reputation loss in the markets. Hence, choosing the lesser of the two evils, policymakers would postpone the inevitable default decision in order to avoid a higher reputational cost, even at a higher economic cost during the delay.

Table 13. Summary of Evidence

Effect of Default on:	Immediate Effect	Long-Run Effect
GDP growth	• Negative effect ranging between 0.6 and 2.5 percentage points • If quarterly data are used no statistically significant effect in the quarter after the default	No statistically significant effect after the year in which the default takes place
Exclusion from capital market	Almost full exclusion	There is no permanent exclusion. Access is regained between four and eight years after the default.
Credit rating	Negative effect of about one notch in the three years after the default	No statistically significant effect after three years
Borrowing cost	• 250 to 400-basis-point increase in the two years after the default • This includes the effect of credit rating downgrade (the effect on spread is smaller and often not statistically significant if credit ratings are included in the regression)	No statistically significant effect after two years
Trade	• Net decrease of bilateral trade (about 8 percent) • Negative effect on export-oriented industries	• The negative effect on bilateral trade lasts for approximately 15 years. • The effect on export-oriented industries lasts for two to three years
Trade credit	Decline of 0.5 percentage points in the year of the default and the year after the default	Some evidence of an effect up to four years after the default
Banking crises	An increase in the probability of a banking crisis of approximately 11 percentage points	
Politicians and policymakers	• A 16 percent decrease in support of the ruling party in the first election after a default. • A 50 percent increase in the probability of replacing the head of the executive • A 33 percent increase in the probability of replacing the minister of finance or the head of the central bank.	

Note: This table is based on the various articles surveyed in this paper and on the various econometric experiments included in the paper.

APPENDIX I

Table A1. Private Lending to Sovereign: Default and Rescheduling

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
Africa	Algeria			1991	1996				1991
Africa	Angola			1985	2004	1988	1992	1988	
Africa	Burkina Faso			1983	1996				1982
Africa	Burundi								1986
Africa	Cameroon								1979
Africa	Cameroon			1985	2003	1989	1992	1989	1985
Africa	Cape Verde			1981	1996				
Africa	Central African Rep.			1981					
Africa	Central African Rep.			1983	2004				
Africa	Congo			1983	2004	1986	1992	1986	
Africa	Congo, Dem. Rep.					1961			
Africa	Congo, Dem. Rep.			1976	2004	1976	1992	1976	1975
Africa	Côte d'Ivoire			1983	1998	1984	1992	1984	1987
Africa	Côte d'Ivoire	2000	2004						
Africa	Egypt	1876	1880			1816	1880	1876	
Africa	Egypt					1984	1992	1984	1986
Africa	Ethiopia			1991	1999				1987
Africa	Gabon					1978			

Africa	Gabon			1986	1994	1986	1992	1986	
Africa	Gabon			1999	2004				
Africa	Gambia			1986	1990	1986	1988	1986	
Africa	Ghana					1969	1974		
Africa	Ghana			1987					
Africa	Guinea			1986	1988				
Africa	Guinea			1991	1998	1985	1992		
Africa	Guinea-Bissau			1983	1996				
Africa	Kenya			1994	2004				1990
Africa	Lesotho								1990
Africa	Liberia	1875	1898			1875	1898	1874	
Africa	Liberia	1912							
Africa	Liberia	1914	1915						
Africa	Liberia	1917	1918						
Africa	Liberia	1919	1923			1912	1923	1912	
Africa	Liberia	1932	1935			1932	1935		
Africa	Liberia			1987	2004	1980	1992	1980	
Africa	Madagascar			1981	2002	1981	1992	1981	1980
Africa	Malawi			1982		1982	1988	1982	
Africa	Malawi			1988					1987
Africa	Mauritania			1992	1996				
Africa	Morocco	1903	1904			1903	1904		
Africa	Morocco			1983					
Africa	Morocco			1986	1990	1983	1990	1983	1985
Africa	Mozambique			1980					
Africa	Mozambique			1983	1992	1984	1992	1984	
Africa	Niger			1983	1991	1983	1991	1983	1984
Africa	Nigeria								1972
Africa	Nigeria	1986	1988						
Africa	Nigeria	1992		1982	1992	1983	1991	1983	1986
Africa	Nigeria	2002							
Africa	São Tomé and Principe			1987	1994				
Africa	Senegal			1981	1985	1981	1992	1981	1984

Table A1 *(continued)*

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
Africa	Senegal			1990					1989
Africa	Senegal			1992	1996				
Africa	Seychelles			2000	2002				
Africa	Sierra Leone								1972
Africa	Sierra Leone			1983	1984				
Africa	Sierra Leone			1986	1995	1977	1992	1977	
Africa	South Africa			1985	1987	1985	1992	1985	
Africa	South Africa			1989					
Africa	South Africa			1993					
Africa	Sudan			1979	2004	1979	1992	1979	1976
Africa	Tanzania			1984	2004	1984	1992	1984	
Africa	Togo			1979	1980				
Africa	Togo			1982	1984				
Africa	Togo			1988					
Africa	Togo			1991	1997	1979	1992	1979	
Africa	Tunisia	1867	1870			1867	1870		
Africa	Tunisia								1991
Africa	Uganda			1980	1993	1981	1992	1981	
Africa	Zambia								1978
Africa	Zambia			1983	1994	1983	1992	1983	
Africa	Zimbabwe	1965	1980			1965	1980		
Africa	Zimbabwe			2000	2004				

Asia	Bangladesh								1978
Asia	Bangladesh								1991
Asia	China	1921	1936						
Asia	China	1939	1949			1921	1949		
Asia	Indonesia			1998	1999				1998
Asia	Indonesia			2000					
Asia	Indonesia			2002					
Asia	Iran			1978	1995	1992			
Asia	Iraq			1987	2004	1990	1992		
Asia	Japan	1942	1952			1942	1952		
Asia	Jordan			1989	1993	1989	1992	1989	
Asia	Korea								1998
Asia	Korea, Dem. Rep.			1974	2004				
Asia	Myanmar			1997	2004				
Asia	Pakistan	1999		1998	1999			1981	
Asia	Philippines			1983	1992	1983	1992	1983	1984
Asia	Sri Lanka								1992
Asia	Thailand								1998
Asia	Turkey	1876	1881			1876	1881	1876	
Asia	Turkey	1915	1928			1915	1932	1915	
Asia	Turkey	1931	1932						
Asia	Turkey	1940	1943			1940	1943	1940	
Asia	Turkey					1959			
Asia	Turkey					1965			
Asia	Turkey			1978	1979	1978	1982	1978	
Asia	Turkey			1982					
Asia	Vietnam			1985	1998	1985	1992	1985	1984
Asia	Yemen			1985	2001				
Europe	Albania			1991	1995	1990	1992		
Europe	Austria					1802	1816		
Europe	Austria	1868	1870			1868	1870	1868	
Europe	Austria	1914	1915			1914	1915	1914	
Europe	Austria	1932	1933			1932	1952	1932	
Europe	Austria	1938							

Table A1 *(continued)*

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
Europe	Austria	1940	1952						
Europe	Bosnia and Herzegovina			1992	1997				
Europe	Bulgaria	1916	1920			1915	1920	1915	
Europe	Bulgaria	1932				1932	1992	1932	
Europe	Bulgaria			1990	1994	1990	1992		
Europe	Croatia			1992	1996				
Europe	Czechoslovakia	1938	1946			1938	1946		
Europe	Czechoslovakia	1959	1960			1952	1959		
Europe	Germany	1932	1938					1932	
Europe	Germany	1939	1953			1932	1953		
Europe	Germany East					1949	1992		
Europe	Greece	1826	1878			1826	1878	1824	
Europe	Greece	1894	1897			1894	1897	1893	
Europe	Greece	1932	1964			1932	1964		
Europe	Hungary	1932	1937			1932	1967		
Europe	Hungary	1941	1967					1931	
Europe	Italy	1940	1946			1940	1946	1940	
Europe	Macedonia			1992	1997				
Europe	Moldova	1998						2002	
Europe	Moldova	2002							

Europe	Netherlands					1802	1814		
Europe	Poland	1936	1937						
Europe	Poland	1940	1952			1936	1952	1936	
Europe	Poland			1981	1994	1981	1992	1981	
Europe	Portugal	1837	1841			1834	1841	1834	
Europe	Portugal	1850	1856			1850	1856		
Europe	Portugal	1892	1901			1892	1901	1892	
Europe	Romania							1915	
Europe	Romania	1933	1958			1933	1958	1933	
Europe	Romania			1981	1983	1982	1987	1981	
Europe	Romania			1986					
Europe	Russia/USSR					1839		1839	
Europe	Russia/USSR					1885			
Europe	Russia/USSR	1918				1917	1918	1917	
Europe	Russia/USSR			1991	1997	1991	1992		
Europe	Russia/USSR	1998	2000					1998	
Europe	Serbia and Montenegro			1992	2004				
Europe	Slovenia			1992	1996				
Europe	Spain	1824	1834			1820		1820	
Europe	Spain					1831	1834	1831	
Europe	Spain					1851			
Europe	Spain	1837	1867			1867	1872	1867	
Europe	Spain	1827	1882			1882		1882	
Europe	Ukraine	1998	2000					1998	
Europe	Yugoslavia	1895				1895		1895	
Europe	Yugoslavia	1933	1950			1933	1960	1933	
Europe	Yugoslavia	1992		1983	1991	1983	1992	1983	
LAC	Antigua and Barbuda			1996	2004				
LAC	Argentina	1828	1857					1830	
LAC	Argentina	1890	1893			1890	1893	1890	
LAC	Argentina					1956	1965		
LAC	Argentina	1989		1982	1993	1982	1992	1982	1983

Table A1 *(continued)*

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
LAC	Argentina	2001	2004	2001	2004			2001	
LAC	Bolivia	1875	1879			1875	1879	1874	
LAC	Bolivia	1931	1948			1931	1957	1931	
LAC	Bolivia			1980	1984	1980	1992	1980	
LAC	Bolivia	1989	1997	1986	1993				
LAC	Brazil	1826	1829			1826	1829	1826	
LAC	Brazil	1898	1901			1898	1910	1898	
LAC	Brazil	1902	1910						
LAC	Brazil	1914	1919			1914	1919	1914	
LAC	Brazil	1931	1933					1931	
LAC	Brazil	1937	1943			1931	1943		
LAC	Brazil					1961	1964		
LAC	Brazil			1983	1994	1983	1992	1983	
LAC	Chile	1826	1842			1826	1842	1826	
LAC	Chile	1880	1883			1880	1883	1879	
LAC	Chile	1931	1947			1931	1948	1931	
LAC	Chile					1965			
LAC	Chile					1972	1975		1973
LAC	Chile			1983	1990	1983	1990	1983	
LAC	Colombia	1826	1845						
LAC	Colombia	1850	1861			1826	1861	1826	
LAC	Colombia	1873				1873			

LAC	Colombia	1880	1896						
LAC	Colombia	1900	1904			1880	1904	1879	
LAC	Colombia	1932	1934					1900	
LAC	Colombia	1935	1944			1932	1944	1932	
LAC	Colombia								1985
LAC	Costa Rica	1828	1840			1828	1840	1827	
LAC	Costa Rica	1874	1885			1874	1885	1874	
LAC	Costa Rica	1895	1897						
LAC	Costa Rica	1901	1911			1895	1911	1895	
LAC	Costa Rica	1932	1952			1932	1953	1937	
LAC	Costa Rica	1962							
LAC	Costa Rica			1981					
LAC	Costa Rica	1984	1985	1983	1990	1981	1990		
LAC	Cuba	1933	1934			1933	1934	1933	
LAC	Cuba	1960				1960	1963		
LAC	Cuba			1982	2004	1982	1992	1982	
LAC	Dominica			2003	2004			2003	
LAC	Dominican Rep.							1869	
LAC	Dominican Rep.	1872	1888						
LAC	Dominican Rep.	1892	1893						
LAC	Dominican Rep.	1897							
LAC	Dominican Rep.	1899	1907			1872	1907	1899	
LAC	Dominican Rep.	1931	1934			1931	1934	1931	
LAC	Dominican Rep.								1976
LAC	Dominican Rep.			1982	1994	1982	1992	1982	
LAC	Ecuador	1826	1855			1832	1855	1832	
LAC	Ecuador	1868	1890						
LAC	Ecuador	1894	1898			1868	1898	1868	
LAC	Ecuador	1906	1908			1906	1955		
LAC	Ecuador	1909	1911					1911	
LAC	Ecuador	1914	1924					1914	
LAC	Ecuador	1929	1954					1931	
LAC	Ecuador			1982	1995	1982	1992	1982	1983
LAC	Ecuador	1999	2000					1999	

Table A1 *(continued)*

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
LAC	El Salvador	1828	1860			1828	1860	1827	
LAC	El Salvador	1898							
LAC	El Salvador	1921	1922			1921	1922	1921	
LAC	El Salvador	1932	1935						
LAC	El Salvador	1938	1946			1932	1946	1931	
LAC	El Salvador								1984
LAC	El Salvador								1995
LAC	Guatemala	1828	1856			1828	1856	1828	
LAC	Guatemala	1876	1888			1876	1888	1876	
LAC	Guatemala	1894						1894	
LAC	Guatemala	1899	1913			1894	1917		
LAC	Guatemala	1933	1936			1933	1936	1933	
LAC	Guatemala	1989							1985
LAC	Guyana			1979					
LAC	Guyana			1982	2004	1982	1992		
LAC	Haiti			1982	1994				1983
LAC	Honduras	1828	1867			1828	1867	1827	
LAC	Honduras	1873	1925			1873	1925	1873	
LAC	Honduras							1914	
LAC	Honduras								1976
LAC	Honduras			1981	2004	1981	1992	1981	1982

LAC	Jamaica			1978	1979	1978	1990		
LAC	Jamaica			1981	1985				
LAC	Jamaica			1987	1993				
LAC	Mexico	1828	1830					1827	
LAC	Mexico	1833	1841						
LAC	Mexico	1844	1850			1828	1850		
LAC	Mexico	1854	1864						
LAC	Mexico	1866	1885			1859	1885	1867	
LAC	Mexico	1914	1922			1914	1922	1914	
LAC	Mexico	1928	1942			1928	1942		
LAC	Mexico			1982	1990	1982	1990	1982	
LAC	Nicaragua	1828	1874			1828	1874	1828	
LAC	Nicaragua	1894	1895			1894	1895	1894	
LAC	Nicaragua	1911	1912					1911	
LAC	Nicaragua	1915	1917			1911	1917		
LAC	Nicaragua	1932	1937			1932	1937	1932	
LAC	Nicaragua			1979	2004	1980	1992	1980	1978
LAC	Panama	1932	1946			1932	1946	1932	
LAC	Panama	1987	1994	1983	1996	1983	1992	1982	
LAC	Panama								1987
LAC	Paraguay							1827	
LAC	Paraguay	1874	1885			1874	1885	1874	
LAC	Paraguay	1892	1895			1892	1895		
LAC	Paraguay	1920	1924			1920	1924	1920	
LAC	Paraguay	1932	1944			1932	1944	1932	
LAC	Paraguay			1986	1992	1986	1992	1986	1984
LAC	Paraguay	2003	2004						
LAC	Peru	1826	1848			1826	1848	1826	
LAC	Peru	1876	1889			1876	1889	1876	
LAC	Peru	1931	1951			1931	1951	1931	
LAC	Peru					1968	1969		
LAC	Peru			1976					
LAC	Peru			1978					
LAC	Peru			1980					

Table A1. *(concluded)*

		Standard and Poor's (1824–2004)				Beim and Calomiris (1800–1992)		Sturzenegger and Zettelmeyer (1874–2003)	Detragiache and Spilimbergo (1973–91)
		Foreign currency bond debt		Foreign currency bank debt					
Region	Country	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	End of period	Beginning of period	Beginning of period
LAC	Peru			1984	1997	1978	1992	1978	
LAC	Peru							1983	1983
LAC	Trinidad and Tobago			1988	1989	1989	1989		1988
LAC	Uruguay	1876	1878			1876	1878	1876	
LAC	Uruguay	1891				1891		1891	
LAC	Uruguay	1915	1921			1915	1921	1915	
LAC	Uruguay	1933	1938			1933	1938	1933	
LAC	Uruguay			1983	1985				
LAC	Uruguay			1987					
LAC	Uruguay			1990	1991	1983	1991	1983	
LAC	Uruguay	2003						2003	
LAC	Venezuela	1826	1840			1832	1840	1832	
LAC	Venezuela	1848	1859					1847	
LAC	Venezuela	1860	1862						

LAC	Venezuela	1865	1881			1848	1881	1864	
LAC	Venezuela	1892				1892		1892	
LAC	Venezuela	1898	1905			1898	1905		
LAC	Venezuela			1983	1988	1982	1990	1982	1984
LAC	Venezuela			1990					
LAC	Venezuela	1995	1997						

Note: *Standard and Poor's* generally defines sovereign default as the failure to meet a principal or interest payment on the due date (or within the specified grace period) contained in the original terms of the debt issue. In particular, each issuer's debt is considered in default in any of the following circumstances: (1) for local and foreign currency bonds, notes and bills, when either scheduled debt service is not paid on the due date, or an exchange offer of new debt contains terms less favorable than the original issue; (2) for central bank currency, when notes are converted into new currency of less than equivalent face value; and (3) for bank loans, when either scheduled debt service is not paid on the due date, or a rescheduling of principal and/or interest is agreed to by creditors at less favorable terms then the original loan. Such rescheduling agreements covering short- and long-term debt are considered defaults even where, for legal or regulatory reasons, creditors deem forced rollover of principal to be voluntary.

Beim and Calomiris only includes private lending through bonds, supplier's credits, or banks loans. The data set does not include every instance of technical default on bond or loan covenants. An extended period (six months or more) was identified where all or part of interest and/or principal payments due were reduced or rescheduled. Some of the defaults and rescheduling involved outright repudiation (a legislative or executive act of government liability), while others were minor and announced ahead of time in a conciliatory fashion by debtor nations. The end of each period of default or rescheduling was recorded when full payments resumed or restructuring was agreed upon. Periods of default or rescheduling within five years of each other were combined. Where a formal repudiation was identified, its date served as the end of the period of default and the repudiation is noted in notes, where no clear repudiation was announced the default was listed as persisting. Voluntary refinancing (Colombia, 1985, and Algeria, 1992) were not included.

Sturzenegger and Zettelmeyer: Unless otherwise noted, all defaults are federal or central government defaults. Defaults of U.S. southern states in early 1840s are not shown in the table. Defaults on wars, revolutions, occupations and the collapse of the Soviet Union etc. are excluded, except when they coincide with a cluster. In the event of sequence rescheduling, the year listed refers to the initial default or rescheduling.

Detragiache and Spilimbergo: An observation is classified as a debt crises if either or both of the following conditions occur: (1) there are arrears of principal or interest on external obligations towards commercial creditors (banks or bondholders) of more than 5 percent of total commercial debt outstanding; and (2) there is a rescheduling or debt restructuring agreement with commercial creditors as listed in the GDF.

APPENDIX II

Table A2. Logit model for the probability of default

	(1)	(2)
	DEF	DEF_B
Total debt to GDP_1 × Dummy 70s	1.973	6.058
	(0.87)	(2.89)
Total debt to GDP_1 × Dummy 80s	0.081	−5.920
	(0.03)	(2.60)
Total debt to GDP_1 × Dummy 90s	−0.583	−5.935
	(0.26)	(2.75)
Short term debt_1 × Dummy 70s	−1.381	0.751
	(0.33)	(0.29)
Short term debt_1 × Dummy 80s	0.855	−1.448
	(0.20)	(0.55)
Short term debt_1 × Dummy 90s	1.287	−1.178
	(0.30)	(0.43)
Short term interest payments to GDP_1 × Dummy 70s	5.552	3.337
	(2.31)	(1.95)
Short term interest payments to GDP_1 × Dummy 80s	−5.441	−2.693
	(2.25)	(1.54)
Short term interest payments to GDP_1 × Dummy 90s	−4.418	−1.975
	(1.78)	(1.14)
External debt service to reserves_1 × Dummy 70s	4.843	5.154
	(4.42)	(3.20)
External debt service to reserves_1 × Dummy 80s	−1.234	−6.162
	(0.50)	(3.52)
External debt service to reserves_1 × Dummy 90s	−2.268	−5.778
	(1.22)	(3.52)
Current account balance to GDP_1 × Dummy 70s	0.409	0.210
	(0.49)	(0.20)
Current account balance to GDP_1 × Dummy 80s	−0.286	−0.460
	(0.36)	(0.40)
Current account balance to GDP_1 × Dummy 90s	0.158	0.033
	(0.19)	(0.03)
Exports plus imports to GDP_1 × Dummy 70s	0.115	−0.267
	(0.32)	(0.64)
Exports plus imports to GDP_1 × Dummy 80s	−0.396	0.431
	(1.01)	(1.02)
Exports plus imports to GDP_1 × Dummy 90s	−0.182	0.257
	(0.48)	(0.57)
Concessional debt to total debt_1 × Dummy 70s	−5.356	−4.456
	(1.85)	(1.56)
Concessional debt to total debt_1 × Dummy 80s	4.166	3.482
	(1.39)	(1.21)
Concessional debt to total debt_1 × Dummy 90s	6.343	4.413
	(2.09)	(1.39)
US real treasury bill rate_1	0.184	0.127
	(2.13)	(1.29)
Real GDP growth_1	−0.063	−0.066
	(3.91)	(3.36)

Table A2 *(concluded)*

	(1)	(2)
	DEF	DEF_B
Volatility on inflation_1	0.093	0.017
	(3.16)	(0.76)
Inflation higher than 50 percent_1	0.164	−0.258
	(0.49)	(0.68)
Year of presidential election_1	−0.006	−0.553
	(0.03)	(1.34)
Civil Liberties Index_1	−1.132	−0.028
	(1.22)	(0.03)
US real treasury bill rate_1 × Total debt to GDP_1	−0.101	−0.187
	(0.76)	(1.19)
US real treasury bill rate_1 × Short term debt_1	0.049	0.276
	(0.38)	(1.55)
US real treasury bill rate_1 × Short term interes payments to GDP_1	0.001	−0.126
	(0.01)	(1.62)
US real treasury bill rate_1 × External debt service to reserves_1	−0.558	0.192
	(1.54)	(1.47)
US real treasury bill rate_1 × Current account balance to GDP_1	−0.047	−0.076
	(0.92)	(1.12)
Dummy 80s	1.868	1.667
	(0.85)	(1.29)
Dummy 90s	−0.140	0.600
	(0.06)	(0.37)
Constant	−2.290	−4.532
	(1.05)	(3.12)
Observations	1416	1416
R-square	0.313	0.147

Note: The numbers between brackets are t-statistics.

REFERENCES

Ades, Alberto, Federico Kaune, Paulo Leme, Rumi Masih, and Daniel Tenengauzer, 2000, "Introducing GS-ESS: A New Framework for Assessing Fair Value in Emerging Markets Hard-Currency Debt," Global Economics Paper No. 45 (New York, Goldman Sachs).

Aguiar, Mark, and Gita Gopinath, 2006, "Defaultable Debt, Interest Rates and the Current Account," *Journal of International Economics*, Vol. 69, No. 1, pp. 64–83.

Alichi, Ali, 2008, "A Model of Sovereign Debt in Democracies," IMF Working Paper 08/152 (Washington, International Monetary Fund).

Alvarez, Michael, José Cheibub, Fernando Limongi, and Adam Przeworski, 1999, "ACLP Political and Economic Database," Available via the Internet: www.ssc.upenNumberedu/∼cheibub/data/ACLP_Codebook.PDF.

Arellano, Cristina, 2008, "Default Risk and Income Fluctuations in Emerging Economies," *American Economic Review*, Vol. 98, No. 3, pp. 690–712.

———, and Jonathan Heathcote, 2008, "Dollarization and Financial Integration," (unpublished; Minneapolis, University of Minnesota).

Arellano, Manuel, and Stephen Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, Vol. 58, pp. 277–97.

Arteta, Carlos, and Galina Hale, 2008, "Sovereign Debt Crises and Credit to the Private Sector," *Journal of International Economics*, Vol. 74, No. 1, pp. 53–69.

Beim, David O., and Charles W. Calomiris, 2000, *Emerging Financial Markets* (New York, McGraw-Hill/Irwin).

Blustein, Paul, 2005, *And the Money Kept Rolling In (and Out): The World Bank, Wall Street, the IMF, and the Bankrupting of Argentina* (New York, Public Affairs).

Borensztein, Eduardo, and Ugo Panizza, 2006, "Do Sovereign Defaults Hurt Exporters?" IDB Working Paper No. 553 (Washington, Inter-American Development Bank).

Bulow, Jeremy, and Kenneth Rogoff, 1989a, "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review*, Vol. 79, No. (1 March), pp. 43–50.

———, 1989b, "A Constant Recontracting Model of Sovereign Debt," *Journal of Political Economy*, Vol. 97, No. 1, pp. 155–78.

Calvo, Guillermo, Leonardo Leiderman, and Carmen M. Reinhart, 1993, "Capital Inflows to Latin America: The Role of External Factors," *IMF Staff Papers*, Vol. 40, No. 1, pp. 108–51.

Cantor, Richard, and Frank Packer, 1996, "Determinants and Impact of Sovereign Credit Ratings," Federal Reserve Bank of New York, *Economic Policy Review*, Vol. 2, No. 2, pp. 37–53.

Caprio, Gerard, and Daniela Klingebiel, 2003, "Episodes of Systemic and Borderline Financial Crises" (unpublished; Washington, World Bank).

Chuan, Punam, and Federico Sturzenegger, 2005, "Defaults Episodes in the 1980s and 1990s: What Have We Learned?" in *Managing Economic Volatility and Crises*, ed. by Joshua Aizenman and Brian Pinto (Cambridge, Cambridge University Press).

Chowdhry, Bhagwan, 1991, "What Is Different about International Lending?" *Review of Financial Studies*, Vol. 4, No. 1 (Spring), pp. 121–48.

Cooper, Richard N., 1971, "Currency Devaluation in Developing Countries," Essays in International Finance No. 86 (Princeton, New Jersey, Princeton University).

Dell'Ariccia, Giovanni, Isabel Schnabel, and Jeromin Zettelmeyer, 2002, "Moral Hazard and International Crisis Lending: A Test," IMF Working Paper 02/181 (Washington, International Monetary Fund).

———, Enrica Detragiache, and Raghuram Rajan, 2005, "The Real Effect of Banking Crises," IMF Working Paper 05/63 (Washington, International Monetary Fund).

De Paoli, Bianca, Glenn Hoggarth, and Victoria Saporta, 2006, "Costs of Sovereign Default," Financial Stability Paper No. 1 (Bank of England).

Detragiache, Enrica, and Antonio Spilimbergo, 2001, "Crises and Liquidity: Evidence and Interpretation," IMF Working Paper 01/2 (Washington, International Monetary Fund).

Díaz-Alejandro, Carlos F., 1983, "Stories of the 1930s for the 1980s," in *Financial Policies and the World Capital Market: The Problem of Latin American Countries*, ed. by

Pedro Aspe Armella, Rudiger Dornbusch, and Maurice Obstfeld (Chicago, University of Chicago Press).

Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer, 2007, "Private Credit in 129 Countries," *Journal of Financial Economics*, Vol. 84, No. 2, pp. 299–329.

Dooley, Michael, 2000, "International Financial Architecture and Strategic Default: Can Financial Crises be Less Painful?" *Carnegie-Rochester Conference Series on Public Policy*, Vol. 53, Issue. 1, pp. 361–77.

———, Peter Garber, and David Folkerts-Landau, 2007, "The Two Crises of International Economics," NBER Working Paper No. 13197 (Cambridge, Massachusetts, National Bureau of Economic Research).

Eaton, Jonathan, and Mark Gersovitz, 1981, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," *Review of Economic Studies*, Vol. 48, No. 2 (April), pp. 289–309.

Eichengreen, Barry, and Richard Portes, 1995, *Crisis? What Crisis? Orderly Workouts for Sovereign Debtors* (London, Centre for Economic Policy Research).

———, Ricardo Hausmann, and Ugo Panizza, 2005, "The Mystery of Original Sin," in *Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economies*, ed. by Barry Eichengreen and Ricardo Hausmann (Chicago, University of Chicago Press).

English, William B, 1996, "Understanding the Costs of Sovereign Default: American State Debts in the 1840s," *American Economic Review*, Vol. 86, No. 1 (March), pp. 259–75.

Flandreau, Marc, and Frederic Zumer, 2004, "The Making of Global Finance 1880–1913," OECD Development Center Research Monograph (Paris, Organization for Economic Cooperation and Development).

Frankel, Jeffrey A, 2005, "Contractionary Currency Crashes in Developing Countries," *IMF Staff Papers*, Vol. 52, No. 2, pp. 149–92.

Gapen, Michael, Dale Gray, Cheng Hoom Lim, and Yingbin Xiao, 2005, "Measuring and Analyzing Sovereign Risk with Contingent Claims," IMF Working Paper 05/155 (Washington, International Monetary Fund).

Gelos, R. Gaston, Ratna Sahay, and Guido Sandleris, 2004, "Sovereign Borrowing by Developing Countries: What Determines Market Access?" IMF Working Paper 04/221 (Washington, International Monetary Fund).

Glick, Rueven, and M. Hutchinson, 2001, "Banking Crises and Currency Crises: How Common Are the Twins," in *Financial Crises in Emerging Markets*, ed. by R. Glick, R. Moreno, and M. Spiegel (New York, Cambridge University Press).

Grossman, Herschel I., and John B. Van Huyck, 1988, "Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation," *American Economic Review*, Vol. 78, No. 5, pp. 1088–97.

Hatchondo, Juan Carlos, Leonardo Martinez, and Horacio Sapriza, 2007, "The Economics of Sovereign Defaults," *Economic Quarterly*, Federal Reserve Bank of Richmond, Vol. 93, No. 2, pp. 163–87.

Kaminsky, Graciela, and Carmen M. Reinhart, 1999, "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," *American Economic Review*, Vol. 89, No. 3, pp. 473–500.

Kealhofer, Stephen, 2003, "Quantifying Credit Risk I: Default Prediction," *Financial Analysts Journal*, Vol. 59, No. 1, pp. 30–44.

Kletzer, Kenneth M., and Brian D. Wright, 2000, "Sovereign Debt as Intertemporal Barter," *American Economic Review*, Vol. 90, No. 3, pp. 621–39.

Kohlscheen, Emanuel, and Stephen A. O'Connell, 2007, "A Sovereign Debt Model with Trade Credit and Reserves" (unpublished; University of Warwick).

Kraay, Aart, and Vikram Nehru, 2006, "When is External Debt Sustainable?" *World Bank Economic Review*, Vol. 20, No. 3, pp. 341–65.

Krugman, Paul, 1988, "Financing vs. Forgiving a Debt Overhang," *Journal of Development Economics*, Vol. 29, No. 3, pp. 253–68.

Levy Yeyati, Eduardo, forthcoming, "Optimal Debt: On the Insurance Value of International Debt Flows to Developing Economies," *Open Economies Review*.

———, and Ugo Panizza, 2005, *The Elusive Costs of Sovereign Defaults* IDB Research Department Working Paper #581 (Washington, Inter-American Development Bank).

Lindert, Peter, and Peter Morton, 1989, "How Sovereign Debt Has Worked," in *Developing Country Debt and the World Economy*, ed. by Jeffrey Sachs (Chicago and London, The University of Chicago Press).

Love, Inessa, and Rida Zaidi, 2004, "Trade Credit and Financing Constraints: Evidence from the East Asian Crisis" (unpublished; Washington, World Bank).

———, Lorenzo Preve, and Virginia Sarria-Allende, 2005, "Trade Credit and Bank Credit: Evidence from Recent Financial Crises," World Bank Policy Research Technical Report 3716.

Manasse, Paolo, Nouriel Roubini, and Axel Schimmelpfennig, 2003, "Predicting Sovereign Debt Crises," IMF Working Paper 03/221 (Washington, International Monetary Fund).

Martinez, Jose Vicente, and Guido Sandleris, 2008, "Is it Punishment? Sovereign Defaults and the Decline in Trade," Universidad Torcuato Di Tella Working Paper No. 1/2008 (Buenos Aires).

McGillivray, Fiona, and Alastair Smith, 2000, "Trust and Cooperation Through Agent-Specific Punishments," *International Organization*, Vol. 54, No. 4, pp. 584–607.

McGillivray, Fiona, and Alastair Smith, 2004, "The Impact of Leadership Turnover on Trading Relations Between States," *International Organization*, Vol. 58, No. 3, pp. 567–600.

———, 2005, "The Impact of Leadership Turnover and Domestic Institutions on International Cooperation in a Noisy World," *Journal of Conflict Resolution*, Vol. 49, No. 5, pp. 639–60.

———, 2006, "Credibility in Compliance and Punishment: Leader Specific Punishments and Credibility," *Journal of Politics*, Vol. 68, No. 2, pp. 248–58.

Mendoza, Enrique G., and Vivian Z. Yue, 2008, "A Solution to the Default Risk-Business Cycle Disconnect," NBER Working Paper No. 13861 (Cambridge, Massachusetts, National Bureau of Economic Research).

Merton, Robert C, 1974, "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates," *Journal of Finance*, Vol. 29, No. 2, pp. 449–70.

Mitchener, Kris James, and Marc D. Weidenmier, 2005, "Supersanctions and Sovereign Debt Repayment," NBER Working Paper No. 11472. (Cambridge, Massachusetts, National Bureau of Economic Research).

Ozler, Sule, 1993, "Have Commercial Banks Ignored History? *American Economic Review*, Vol. 83, No. 3, pp. 608–20.

Panizza, Ugo, Federico Sturzenegger, and Jeromin Zettelmeyer, forthcoming, "The Economics and Law of Sovereign Debt and Sovereign Default," *Journal of Economic Literature*.

Pescatori, Andrea, and Amadou N.R. Sy, 2007, "Are Debt Crises Adequately Defined? *IMF Staff Papers*, Vol. 54, No. 2, pp. 306–37.

Rajan, Raghuram G., and Luigi Zingales, 1998, "Financial Dependence and Growth," *American Economic Review*, Vol. 88, No. 3, pp. 559–86.

Reinhart, Carmen, and Kenneth Rogoff, 2008, "The Forgotten History of Domestic Debt," NBER Working Paper No. 13946. (Cambridge, Massachusetts, National Bureau of Economic Research).

———, and Miguel A. Savastano, 2003, "Debt Intolerance," *Brookings Papers on Economic Activity*: 1 (Washington, The Brookings Institution).

Richmond, Christine, and Daniel A. Dias, 2008, "Duration of Capital Market Exclusion: Stylized Facts and Determining Factors" (unpublished; UCLA).

Rochet, Jean Charles, 2006, "Optimal Sovereign Debt: An Analytical Approach," IDB Research Department Working Paper No. 573 (Washington, Inter-American Development Bank).

Rose, Andrew K, 2005, "One Reason Countries Pay Their Debts: Renegotiation and International Trade," *Journal of Development Economics*, Vol. 77, No. 1, pp. 189–206.

———, and Mark M. Spiegel, 2007, "Non-Economic Engagement and International Exchange: The Case of Environmental Treaties" (unpublished; University of California Berkeley).

Sachs, Jeffrey, 1989, "The Debt Overhang of Developing Countries," in *Debt, Growth and Stabilization: Essays in Memory of Carlos Diaz Alejandro*, ed. by Jorge de Macedo and Ronald Findlay (Oxford, Blackwell).

Sturzenegger, Federico, and Jeromin Zettelmeyer, 2006, *Debt Defaults and Lessons from a Decade of Crises* (Cambridge, Massachusetts, MIT Press).

Sutter, Matthias, 2003, "The Political Economy of Fiscal Policy: An Experimental Study on the Strategic Use of Deficits," *Public Choice*, Vol. 116, No. 3–4 (September), pp. 313–32.

Tomz, Michael, 2002, "Democratic Default: Domestic Audiences and Compliance with International Agreements" (unpublished; Stanford University).

———, 2007, *Reputation and International Cooperation: Sovereign Debt Across Three Centuries* (Princeton, New Jersey, Princeton University Press).

———, and Mark Wright, 2007, "Do Countries Default in Bad Times?" *Journal of the European Economic Association*, Vol. 5, No. 2, pp. 352–60.

Trebesch, Cristoph, 2009, "The Cost of Aggressive Sovereign Debt Policies: How Much is the Private Sector Affected?" IMF Working Paper 29/09 (Washington, International Monetary Fund).

World Bank, 2004, "Financing Developing Countries' Trade," Chapter 5 in *Global Development Finance 2004: Harnessing Cyclical Gains for Development* (Washington, World Bank).

Wright, Mark, 2003, "Reputations and Sovereign Debt," (unpublished; Stanford University).