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Primary Surpluses and Sustainable Debt Levels in Emerging Market Countries

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Abstract

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This paper aims to put some constraints on the way primary surpluses are projected when making assessments of public debt sustainability. Projections should be tied either to the country's historical track record in generating surpluses—if the institutional and other factors accounting for this track record are expected to persist—or to some model that links primary surpluses to their fundamental determinants, either on the basis of constant institutions and policies or a credible reform program. History-based or model-based primary surplus projections provide a useful benchmark for judging the realism of fiscal forecasts underlying debt sustainability calculations. Together with information on future growth and interest rates, the primary surplus projections can be used to generate measures of overborrowing, and the magnitude of adjustment needed to return debt to a sustainable level.

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Contents   Page

Tables

Figures

I. INTRODUCTION

The IMF's approach to gauging public debt sustainability rests on making projections of a range of macroeconomic variables, including growth, interest rates, the exchange rate, and the primary surplus. In the context of Fund-supported programs, these paths can be more optimistic than recent historical experience might suggest, because one intention of such programs is to create a structural break in performance—in the case of capital account crises that have their origin in concerns about fiscal solvency, for example, through fiscal reforms that should reduce the vulnerabilities that have led a country to experience a crisis. At the same time, there remains a danger that the assumed break with the past (say, in the form of a sharp and sustained increase in the primary surplus) may not be plausible, either judged against the country's historical experience—even in past periods of significant fiscal effort including under a previous Fund-supported program—or against the experience of a peer group of other countries with similar characteristics. While judgment will always be an integral component of any medium-term fiscal forecast, useful cross-checks—based on what a country has been able to achieve in the past or what the cross-country evidence suggests countries with similar characteristics have been able to sustain—can only add to the realism of the fiscal forecasts underpinning debt sustainability analyses.[2]

The IMF's shareholders have also been worried about an optimistic bias in debt sustainability analyses undertaken by the Fund, particularly in program countries where country teams could face a conflict of interest (as partial "owners" of the program). Such concerns were reflected, for example, in the G-7 Communiqué following the 2005 Spring Meetings of the IMF and World Bank, where more "independence of debt sustainability analysis" was called for. While the present paper is silent on whether any such bias exists or on the need for a separation of debt sustainability analysis, it does see benefit in cross-checking fiscal projections from debt sustainability analyses with those obtained using alternative approaches (such as those developed below) as a possible way to limit shareholders' concerns. In this vein, the approach developed here should be viewed as complementing the debt sustainability template approach that is used in the Fund.

Below an attempt is made to put some more discipline on primary surplus projections, by linking these either to a country's historical experience—including in past periods of peak effort if the conditions that made such effort possible are plausible going forward—or to a model of surplus-generating capacity that links surpluses to fundamentals. The model can also be used to gauge the impact of reforms on surplus-generating capacity, allowing for richer forecasts, depending on implementation and sustainability of various reforms.

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[2] Debt sustainability analyses in the context of Fund-supported programs have generally been highly optimistic—with sharp reductions in public debt projected over three years, but actual public debt rising over the same horizon. While the main culprits appear to be below-the-line items (skeletons such as banking crises but also currency depreciations), and lower-than-projected growth, slippages in the fiscal balance have also contributed (IMF, 2004).

A second focus of the paper is to draw implications of the projected path of future surpluses for the sustainable level of public debt—where sustainability is used here to denote the maximum debt level consistent with intertemporal solvency (rather than to capture notions of illiquidity at a point in time). By linking judgments about the sustainable debt level to history-based or model-driven assessments of future surplus-generating capacity, estimates of sustainable debt can be obtained and compared with actual debt levels to gauge the extent of overborrowing (the amount by which actual debt exceeds future surplus-generating capacity). Estimates of sustainable debt can be used to guide policy—providing a broad objective that countries can aim for. (By contrast, the debt-stabilizing primary balance, with its focus on the surplus level that stabilizes debt near its current level, has little normative content.) If overborrowing is significant, then reforms that could boost surplus-generating capacity need to be considered (higher surplus-generating capacity implying higher sustainable debt), but if these are insufficient to close the gap, then other measures— e.g., reforms to enhance the economy's growth potential or write-downs to reduce the value of current debt commitments—would also need to be put on the table.

An important omission from the present approach is the need to incorporate uncertainty, which affects not only the level of surplus needed to guard against insolvency, but also raises issues related to illiquidity. The current analysis also does not account for the possibility of virtuous cycles where improvements in fiscal performance have positive effects on growth and/or interest rates. These issues deserve to be tackled in future research.

II. THE APPROACH

The proposed approach aims to consider a number of possible scenarios for the future path of a country's primary surplus, and to draw implications for a country's sustainable debt level. Specifically, one can draw on some combination of four basic scenarios for the surplus:

(1)   Average historical performance based on surpluses generated in the past.

(2)   Extraordinary performance in periods of exceptional effort that could be repeated: e.g., a reformist post-crisis government or a Fund-supported program with strong ownership.

(3)   Utilizing existing institutions fully based on a model linking surplus-generating capacity to institutional and other fundamental factors. Future fiscal behavior could be in line with country fundamentals—this could involve fiscal effort to the degree that the country is underperforming relative to its characteristics at present.

(4)   Raising institutional quality through reforms, again based on the estimated impact of such reforms in the model—say, by assuming that the country over time acquires the same institutional quality as a regional leader.

For instance, if the country has always underperformed in the past, but is signing on to an IMF-supported program where some improvement in fiscal performance is expected during the life of the program (but possibly not beyond), then an appropriate projected path for the surplus might be (3) during the course of the program, reverting to (1) after the program is over. On the other hand, if one is optimistic about the reforms a country is likely

to undertake, surpluses could be determined by (3) for the initial years as the country comes up to the level of its fundamentals and (4) subsequently as it improves its institutions.

Once a plausible path of the surplus is at hand, it can be used to generate an estimate of sustainable debt, the level that can be serviced given the path of growth, interest rates, and future surplus-generating capacity. Of course this notion of sustainability does not deal with liquidity issues: debt may be below our estimate of sustainable debt, yet in response to shocks the country may still run into servicing problems by being illiquid at a point in time. Such issues, however, are best addressed in a stochastic setup, and are left for future research.[3]

The final step involves comparing sustainable and actual debt levels in a sample of emerging market countries. For some (a minority), current debt levels appear to be in a comfortable range—that is, somewhat below maximum sustainable levels based on plausible future paths for the primary surplus. For many others, however, actual debt appears to be well above sustainable levels. The model linking surplus-generating capacity to fundamentals can be used to make an assessment of whether macro policies or institutional reforms alone can plausibly be relied upon to close the gap between actual and sustainable debt, by raising future surplus-generating capacity. While in some cases it can, in others it would appear that a broader menu of options—including measures to enhance the growth potential of the economy, or debt write-downs—would be needed to reduce the extent of excessive debt.

The remainder of this paper is organized as follows. Section III develops and estimates a model of primary surplus-generating capacity in a broad sample of emerging market countries. Section IV looks at a variety of possible measures of sustainable debt, those based on historical surplus behavior (both in average terms and in periods of exceptional fiscal effort) and those based on the model's predictions about future surplus-generating capacity. Comparisons are made between actual debt levels and estimates of sustainable debt, distinguishing cases of large overborrowing, moderate overborrowing, and instances where countries do not appear to have excessive public debt. Section V considers the impact of policy and institutional reforms on the projected path of primary surpluses in a subset of the sample, and draws some implications for sustainable debt levels in these countries. Section VI draws out the main conclusions and some policy implications.

III. MODELING PRIMARY SURPLUS PERFORMANCE

The empirical model used here is a version of the one proposed by Bohn (1998) and generalized in IMF (2003), augmented to include a range of determinants of primary surplus behavior apart from the level of public debt. Specifically, Bohn argued that an implication of

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[3] In principle, the primary surplus model could be combined with a stochastic macro model to generate projections of future debt and probabilities of reaching certain debt thresholds at a point in time. This approach not only takes into account the role of surplus-generating capacity in determining sustainable debt, but also the stochastic shocks hitting the economy: for details on such a risk management approach, see Celasun, Debrun, and Ostry (2005).

the government's intertemporal budget constraint is that, in a regression of the primary surplus against the lagged level of public debt, the coefficient on the latter should be positive and significant. In other words, satisfaction of the intertemporal budget constraint requires that an increase in public debt should elicit an increase in the primary surplus to ensure that public debt does not explode. Bohn showed, in fact, that a strictly positive coefficient on public debt is sufficient to establish long-run sustainability of the debt position.

Of course, the level of primary surplus a country chooses to run is likely to be influenced by a range of variables other than lagged debt. Here we follow a reduced-form approach to examine some potential determinants, along the lines of work set out in IMF (2003) and Mendoza and Oviedo (2004). Specifically, we consider a range of variables to evaluate the contribution of economic, political, and institutional factors in fiscal effort. Our reduced-form specification is of the form:

$$p_{i,t} = \alpha_i + \beta \cdot d_{i,t-1} + \gamma' X_{i,t} + \varepsilon_{i,t}$$

where $p_{i,t}$ is the ratio of primary balance to GDP in country i at time t; α_i is a country-specific intercept (fixed effect); $d_{i,t-1}$ is the debt-to-GDP ratio at the end of the previous period; $X_{i,t}$ is a vector of additional determinants of the primary balance unrelated to the long-run solvency requirement; and $\varepsilon_{i,t}$ is an error term. Bohn (1998) focuses mainly on the debt term in the above equation, while IMF (2003) and Mendoza and Oviedo (2004) examine some, though not all, of the variables that are considered below, and for a subset of the sample and time period considered here. One important wrinkle in the empirical analysis is that we allow for possible nonlinearities in the relationship between debt and fiscal effort, by including a spline for debt at a threshold of 50 percent of GDP. The spline provides a better fit than the addition of higher powers of the debt-to-GDP variable; and among the various spline thresholds, a threshold at a debt-to-GDP ratio of 50 percent maximizes the adjusted R-squared.

A number of variables apart from debt are likely to affect a country's surplus-generating capacity. Economic determinants include the output gap to control for the effects of the business cycle; oil and non-oil commodity prices to control for the impact of commodity price movements on the fiscal position of commodity-exporting countries; and (the logarithm of) CPI inflation to capture possible effects of inflation on the fiscal balance, such as those described by Patinkin (1993). Finally, we would like to include a proxy for the capacity of a country's fiscal institutions to deliver primary surpluses. As is well known, a key factor distinguishing fiscal structures in emerging market countries from those in advanced economies is the relatively low revenue-to-GDP ratio in the former group; this motivates us to use the revenue-to-GDP ratio as a more or less direct proxy for a country's surplus-generating capacity. However, this measure has a number of shortcomings, not least that it is related to the primary surplus through an accounting identity. To get around this problem, as a robustness check we use the lagged—rather than the contemporaneous—revenue ratio, and we also consider robustness of the results to other measures of the quality of fiscal institutions (to capture medium-run surplus-generating capacity), including whether

the country has a fiscal responsibility law, and whether it has an explicit medium-term fiscal framework.[4]

We also include a number of noneconomic factors that may influence fiscal effort. A parliamentary and presidential election dummy variable captures possible political pressure on spending in election years, leading to weaker fiscal performance. The political constraints measure of Henisz (2000) captures the role of checks and balances in determining fiscal outcomes. Finally, we explore the influence of international financial institutions by including a dummy variable if a country has an IMF-supported program in a given year.

The model is estimated using generalized least-squares with cross-sectional weights and country fixed effects. The sample covers 31 emerging market countries over 1990-2002; the variables, and the main shortcomings in the data set, are described in the Data Appendix. Results shown in Table 1 suggest that all variables are correctly signed and significant. Specifically:

- In line with Bohn (1998) and IMF (2003), we find that primary surpluses in emerging markets respond positively to increases in debt at low to moderate levels of debt, indicating a desire to satisfy the intertemporal budget constraint (column 1). But when the debt ratio becomes sufficiently high (in this case more than 50 percent of GDP), the primary surplus becomes only marginally responsive to further increases in debt. This result suggests that at sufficiently high debt levels emerging market countries respond much more weakly to satisfying government solvency constraints.

- Stronger fiscal institutions, proxied by the revenue ratio (column 2), are associated with better surplus-generating capacity (rather than offset, say, by higher spending).

- Primary surpluses also respond in the expected fashion to other economic factors such as the business cycle, inflation, and commodity and oil prices (columns 3 and 4). When the output gap falls (i.e., output gets closer to potential), the surplus rises due to cyclical effects on revenues and expenditures. When inflation rises, the surplus rises, possibly reflecting Patinkin effects if expenditures are fixed in nominal terms, or bracket-creep effects on tax revenues.[5] Commodity and oil prices influence the primary balance of commodity and oil exporters in the expected fashion.

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[4] A number of alternative aspects of the quality of fiscal institutions have been used in the literature, such as those constructed by Von Hagen (1992), Perotti and Kontopoulos (2002), and Alesina and others (1998). But each of these studies covers only a small set of countries—European countries in Von Hagen, OECD countries in Perotti and Kontopoulos, and Latin American countries in Alesina and others—and hence could not be used for our larger sample.

[5] The positive effect of inflation on primary surpluses may also result from higher inflation being associated with greater price volatility and higher real interest rates, thus requiring greater fiscal effort to safeguard debt sustainability.

Table 1. Primary Surplus Determinants

	Dependent Variable: Primary Surplus				
	(1)	(2)	(3)	(4)	(5)
Debt/GDP	0.06	0.05	0.09	0.10	0.08
	(3.98) ***	(3.01) ***	(5.59) ***	(6.24) ***	(6.69) ***
Spline at 50%	-0.04	-0.03	-0.08	-0.09	-0.07
	(1.88) *	(1.59)	(3.78) ***	(4.83) ***	(4.47) ***
Revenue/GDP		0.24	0.14	0.24	0.20
		(4.88) ***	(2.96) ***	(4.78) ***	(5.28) ***
Output gap[1]			-0.10	-0.12	-0.11
			(4.10) ***	(4.94) ***	(4.94) ***
Commodity prices[2]			0.10	0.10	0.09
			(2.05) **	(2.17) **	(2.49) **
Oil prices[2]			0.07	0.06	0.06
			(2.86) ***	(2.58) ***	(3.90) ***
Log(inflation)				1.30	1.37
				(5.68) ***	(7.48) ***
Election year					-0.16
					(1.75) *
Checks and balances					0.94
					(2.69) ***
IMF-supported program					0.92
					(5.90) ***
No. of countries	31	31	31	31	31
Observations	325	325	325	325	325
Adj. R-squared	0.58	0.63	0.63	0.67	0.68

Note: Estimation method is generalized least squares using cross-section weights, with country-specific intercepts (not reported). Absolute value of robust t-statistics are in parentheses.
   1/ Potential minus actual output.
   2/ Applies to oil exporters and commodities exporters only.

- Political and institutional variables also matter: surpluses are lower in election years, are higher in years when a country has an IMF-supported program, and are higher when political institutions (the checks and balances measure) are stronger (column 5).

These results are robust to various alternative specifications (Table 2). Using a random-effects econometric specification does not alter the signs or significance of any of the debt and economic control variables. The political and institutional variables also retain their sign, but the checks-and-balances measure loses significance, as does the election year dummy. The IMF program variable remains significant in the random-effects regression. The results are also robust to inclusion of time fixed effects in the regression. Though not reported in Table 2, the results are not affected by replacing the contemporaneous revenue ratio (which is correlated with the primary surplus through an accounting identity) with the average of the ratio over the previous two years (which is not).

Table 2. Primary Surplus Determinants: Robustness Checks

	Benchmark	Random Effects	Arellano-Bond	With Alternative Fiscal Institution Measures		
Debt/GDP	0.08	0.08	0.09	0.06	0.04	0.04
	(6.69) ***	(4.64) ***	(3.16) ***	(3.86)***	(2.54)**	(2.54)**
Spline at 50%	-0.07	-0.08	-0.04	-0.05	-0.02	-0.02
	(4.47) ***	(3.64) ***	(1.35)	(2.51)**	(1.22)	(1.24)
Revenue/GDP	0.20	0.10	0.42	0.25	0.27	0.27
	(5.28) ***	(3.35) ***	(5.41) ***	(5.49)***	(6.00)***	(6.00)***
Output gap[1]	-0.11	-0.15	-0.10	-0.13	-0.14	-0.14
	(4.94) ***	(4.12) ***	(2.40) **	(6.19)***	(6.47)***	(6.45)***
Commodity prices[2]	0.09	0.11	0.07	0.07	0.06	0.06
	(2.49) **	(2.02) **	(1.40)	(1.63)	(1.43)	(1.44)
Oil prices[2]	0.06	0.11	0.12	0.05	0.05	0.05
	(3.90) ***	(5.71) ***	(6.99) ***	(2.23)**	(2.10)**	(2.11)**
Log(inflation)	1.37	1.49	1.85	1.29	1.39	1.39
	(7.48) ***	(3.44) ***	(2.86) ***	(5.79)***	(10.07)***	(10.03)***
Election year	-0.16	-0.17	-0.09	0.04	0.09	0.09
	(1.75) *	(0.62)	(0.36)	(0.27)	(0.63)	(0.61)
Checks and balances	0.94	-0.41	1.63	3.02	2.94	2.94
	(2.69) ***	(0.58)	(1.66) *	(7.69)***	(7.65)***	(7.64)***
IMF-supported program	0.92	0.76	0.37	0.89	0.86	0.86
	(5.90) ***	(2.51) **	(1.02)	(4.40)***	(4.21)***	(4.21)***
Fiscal responsibility law				-0.21		-0.07
				(0.34)		(0.11)
Medium-term fiscal framework					1.31	1.30
					(3.50)***	(3.45)***
Lagged primary surplus			0.08			
			(1.29)			
No. of countries	31	31	32	30	30	30
Observations	325	325	292	275	275	275

Note: Absolute value of robust *t*-statistics are in parentheses.
 1/ Potential minus actual output.
 2/ Applies to oil exporters and commodities exporters only.

A more stringent test to control for simultaneity is to use the Arellano-Bond estimator, which differences the equation to eliminate country fixed effects and then instruments for the differenced right-hand-side variables with their lagged levels. In this specification, lagged debt, the revenue-to-GDP ratio, the output gap, inflation, oil prices, and the checks-and-balances measure retain their significance, but the other indicators lose significance. The results (not reported) are unchanged if we replace the dependent variable by the cyclically adjusted primary balance, except of course that the output gap loses its significance in this case. Finally, the last columns look at alternative proxies for the quality of fiscal institutions, allowing for the possibility that countries that passed fiscal responsibility legislation or established a medium-term fiscal framework succeeded in improving their surplus-generating capacity over time (we use lagged measures of these variables since our priors are that these effects, if they operate, will not be evident contemporaneously). The results are mixed, with the medium-term fiscal framework variable significant and correctly signed, but with the fiscal responsibility legislation variable insignificant (possibly because in some of the countries such legislation has been passed to offset the impact of weak fiscal institutions). The results are the same whether the revenue

ratio is included or not as a regressor, suggesting that these alternative measures capture aspects of the fiscal regime other than the revenue ratio.

The regressions can be used to generate fitted values for the primary surplus, and these can then form the basis of projections of future primary surpluses to generate measures of sustainable debt, as discussed above. These are done in the following section. Note that the standard error of the predicted value of the primary surplus varies with the value of the right-hand-side variables, but is about 0.6 percent of GDP on average. So in analyzing predicted primary surpluses, a 95 percent confidence interval would be the predicted value, plus or minus 1.2 percent of GDP. This is, admittedly, a wide interval. But to be evenhanded, one advantage of the present approach is that it can at least quantify the degree of uncertainty associated with fiscal forecasts, something that is clearly much more difficult in the absence of an empirical model, where uncertainty may be left unquantified.

IV. MEASURES OF SUSTAINABLE DEBT

To construct sustainable debt measures, we begin with the period budget constraint:

$$d_t = \left(\frac{1+r_t}{1+g_t}\right) \cdot d_{t-1} - p_t$$

$$d_t \approx (1 + r_t - g_t) \cdot d_{t-1} - p_t$$

where d_t is the debt-to-GDP ratio at the end of period t, p_t is the ratio of the primary balance to GDP in period t, and g_t is the growth rate of GDP in period t. Forward substitution for d_{t+1}, d_{t+2}, etc. gives our first and most general forward-looking expression for the debt at time t that can be sustained given future primary surpluses:

$$d_t = \sum_{i=1}^{\infty} \frac{p_{t+i}}{\prod_{j=1}^{i} \left(\frac{1+r_{t+j}}{1+g_{t+j}}\right)}$$

This formula can be used if one assumes a time-varying path for the surplus, and real interest and growth rates, as is the case, for example, in the reform scenarios in Section V. If, on the other hand, one assumes a constant path for these variables, the formula simplifies to:

$$d_t = \sum_{i=1}^{\infty} \frac{p}{\left(\frac{1+r}{1+g}\right)^i} = \frac{p}{r-g}$$

which is what is used in this section. In the following calculations we use the sample average of external and domestic real interest rates for r, weighted by the share of external debt in

total public debt, and we use average real GDP growth over the sample period for g.[6] For p, we will use any of the alternative measures of surplus-generating capacity discussed above—i.e., those based on the model, or based on average or exceptional historical performance. The constraints imposed by the short sample and large number of countries suggests that there is much scope to refine the calculations by improving the country-specific inputs used.

Figure 1 depicts two measures of sustainable debt.[7] The first is based on average—a median of the eight overlapping three-year periods is used to eliminate the effect of outliers—surpluses actually achieved in the 1990-2002 sample. The second is based on the best five-year performance in the sample. One way to look at the results is to view sustainable debt under the first option as giving a reasonable approximation in cases where the factors that constrained fiscal behavior in the past are likely to continue to be binding in the future. To the degree that the country can do better over time, the resulting estimate of sustainable debt under the first option is likely to be an underestimate. On the other hand, the second option that uses the best five-year performance is likely to provide an overestimate of sustainable debt, not only because the policy effort that generated such a large surplus may not be sustainable over time, but also because of luck or random factors that caused the surplus to be temporarily high (e.g., the effect of an oil price boom in an oil-exporting country).
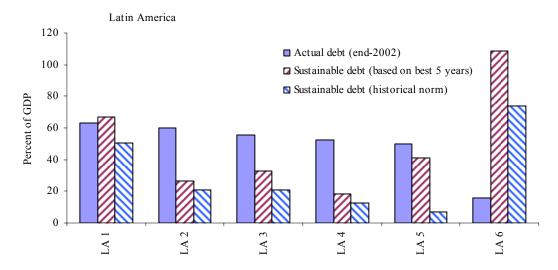
As a general matter, for the bulk of countries portrayed, actual debt is above sustainable debt, not only using average historical behavior to project the future, but even using the best five-year performance.[8] In a number of cases, actual debt is *much* larger than sustainable debt, and it is certainly questionable in such circumstances whether any reasonable amount of fiscal adjustment could be expected to bring actual debt down to a sustainable level. Some other mechanism, such as a restructuring or more favorable growth or interest rates than in the historical experience, would seem likely to be needed. There are, nonetheless, some exceptions—i.e., countries for which at least one of the measures of sustainable debt is above actual debt, and for which overborrowing is not a problem.

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[6] To the degree that interest and growth rates in the 1990s may have been atypical for many emerging markets, as a robustness check we also use r and g calculated over a longer period, 1979-2002, when constructing sustainable debt levels. In general, the results using the longer sample suggest higher levels of sustainable debt, reflecting the smaller gap between r and g by which the future surpluses are deflated.
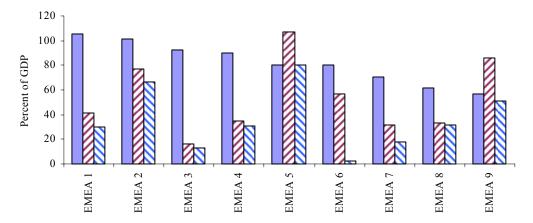
[7] The figure shows the situation in 2002 (the last year for which all the data are available)—as an illustration of the model; in many cases so much has transpired—including some restructurings—that the assessments could be quite different today. We exclude cases where either p or $(r - g)$ is negative, since these do not provide useful benchmarks.

[8] One could also allow for the possibility of virtuous cycles where good fiscal performance improves $(r - g)$. To get at this issue, we can ask what sustainable debt is using the best five-year outturn for $(P/(r - g))$. The results do indeed give higher sustainable debt, but not hugely so (a median improvement of about 3½ percent of GDP over the full sample.

Figure 1. Actual and Historical Sustainable Debt Levels, 2002 1/
(In percent of GDP)

Sources: IMF, World Economic Outlook public debt database; IMF staff calculations. Zero or negative values are omitted.
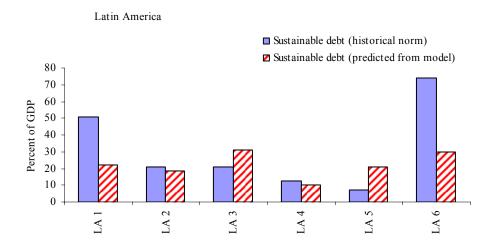
1/ Based on the sample average of r and g.

For Latin America, four of the six countries in Figure 1 have an overborrowing ratio greater than unity, and debt levels in two countries (LA 2 and LA 4) are more than twice the sustainable debt measure even when the best five-year performance is used in the calculation. Other cases (LA 3 and LA 5) appear more ambiguous: while debt is above sustainable levels, steadfast fiscal adjustment might go a long way toward closing the gap, especially if it has favorable effects on growth and spreads. But there are cases (LA country 6, for example) where independent of the measure, debt appears sustainable, and others (such as LA country 1) where, at least according to the best five-year performance, debt is sustainable.

In other emerging markets, there is a similar range. Debt in EMEA 3 is about four times the sustainable level using either measure, while for the other countries overborrowing
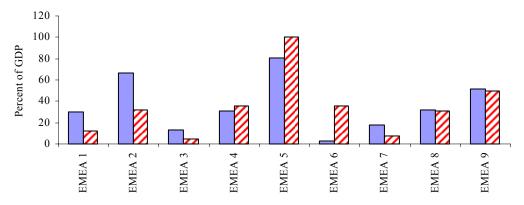
appears to be more moderate. At the other extreme, overborrowing does not appear to be a problem in EMEA 5 or 9, at least based on the "best" measure of sustainable debt.

Figure 2 gives actual and sustainable debt based on the predicted values from the empirical model—the third option described in Section II. For comparison, sustainable debt based on average historical performance is also shown. The comparison is an interesting one, since it gives some notion of the degree to which countries have under- or overperformed relative to fundamentals. If the average historical measure of sustainable debt is lower than the predicted measure, then on average the country has tended to underperform, running primary balances that are smaller than its characteristics would predict, and vice-versa.

Figure 2. Historical and Predicted Sustainable Debt Levels
(Percent of GDP)

Latin America

Europe, Middle East, Africa, and Asia

Sources: IMF, World Economic Outlook public debt database; IMF staff calculations. Zero or negative values are omitted.

It is critical to note that these comparisons relate only to performance relative to the regression. A country may be overperforming in that sense and yet be overborrowing, with actual debt higher than sustainable debt according to any measure. In these cases, debt needs to be brought down even though the country is actually making a considerable fiscal effort by running higher-than-predicted primary balances.

V. THE IMPACT OF REFORMS ON SUSTAINABLE DEBT LEVELS

The final measure of sustainable debt considered in this paper is one that involves a reform scenario, in which countries gradually raise their primary surplus levels above the level predicted by the model. The notion is that, through reforms, countries might improve their characteristics, and thus their surplus-generating capacity, over time. We consider the reform scenario for a small subset of the countries in the sample, mainly to illustrate the impact of reforms on surplus-generating capacity and, thereby, on estimates of sustainable debt. Again for illustrative purposes, it is assumed that the countries' reforms bring them to a level of a regional "leader," taken here to be Chile for the Latin American region, and Korea or the EU average for the Asian and Europe-Middle East-Africa region, respectively.
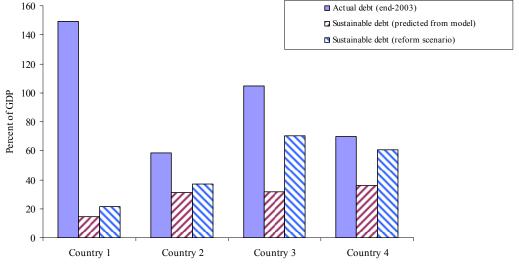
Figure 3. Actual and Sustainable Debt Levels Under Reforms

Sources: IMF, World Economic Outlook public debt database; IMF staff calculations.

Figure 3 illustrates the results and confirms that sustainable debt is somewhat larger under the reform scenario than when countries run surpluses according to their characteristics. The gains from reform are obviously determined entirely in this exercise by the distance between the countries' present fundamentals and those of the regional leader—a larger gap giving a larger improvement in surplus-generating capacity that, over time, raises the sustainable level of public debt for the country. For all but the first country in the figure, reforms do appear to be capable of bridging a large proportion of the gap between actual and

sustainable debt, and probably in fact would do more than is indicated in the figure to the degree that growth would also pick up and spreads would decline under a reform scenario (factors not taken into account in this simple exercise). For the first country, however, reforms would still leave sizable excess debt.

VI. Conclusions

This paper proposes a framework for projecting primary surpluses in the context of debt sustainability assessments under which surpluses may evolve according to one of a number of possible scenarios: the historical track record of the country; the primary surpluses achieved in periods of exceptional fiscal effort in the past, if the factors that made such effort possible are likely to be present going forward; the predicted primary surpluses based on some model that links country characteristics to surplus-generating capacity; or the predicted path of primary surpluses based on a model but augmented to include the effects on surplus-generating capacity of reforms that are likely to be carried out; or even some combination of the above scenarios justified by the country case at hand.

A plausible path of future primary surplus behavior can then be used to generate assessments of the sustainable level of public debt—that is, the level of debt that the country can have today without running into servicing difficulties in the future given reasonable expectations about future fiscal effort. Debt levels that are higher than the present value of the plausible primary surplus path indicate the need for reforms to improve the country's surplus-generating capacity, or to improve the difference between the growth rate and the real interest rate. In cases where the gap between actual and sustainable debt looks unlikely to be filled by plausible reforms, other measures—including a restructuring—would need to be on the table. In the foregoing, applying the model to debt levels at the end of 2002, emerging market country debt levels appear to span a wide range in relation to sustainable levels. While in some cases overborrowing does not appear to be a problem, in others moderate overborrowing—relative to historical trend fiscal performance or likely future performance based on country characteristics—could be solved by surplus-enhancing fiscal reforms, while in a third category, more drastic measures—including possibly a needed restructuring—would appear to be the only way to close the gap between actual and sustainable debt.

The approach taken in this paper can be refined in a number of directions. The most important in our view is to incorporate uncertainty, and allow primary surplus behavior to respond to macroeconomic shocks. Ideally, what is needed is a complete probability distribution of the ratio of public debt to GDP at various time horizons, reflecting the joint stochastic and dynamic properties of disturbances affecting the evolution of the debt ratio. One way of thinking of this is to view sustainability risks in the same way as inflation risks are viewed in an inflation-targeting framework, involving model-consistent projections and probabilities of reaching certain thresholds at a particular point in time. We see the specification of a reasonable model of primary surplus behavior as an important building block to a more general risk management approach to sustainability issues, and thus the results in this paper could provide a helpful input as work on the stochastic setup progresses.

Data Appendix

The data used in this study, which builds on the public debt dataset compiled for the September 2003 *World Economic Outlook (WEO)*, covers 31 emerging market countries from 1990-2002, although the sample is unbalanced because some countries do not have data available for the whole period. Data were collected from IMF staff reports and country economists. Of these 31 countries, 19 had data for the public sector, 10 for the general government, and 5 for the central government. For most countries, data are on a gross basis (financial assets are not netted out), with Brazil, Egypt, Jordan, Pakistan, and Turkey being exceptions. For more details on the shortcomings of the fiscal data, including differences in coverage and definitions of the public sector, see Box 3.1 of the September 2003 *WEO*.

In addition to data on primary balances, the ratio of public debt to GDP, and the ratio of revenue to GDP, the dataset includes information on some potential determinants of fiscal effort, including the output gap (measured as the percentage deviation of real GDP from a Hodrick-Prescott trend), oil and commodity prices (also measured as the percentage deviations from a Hodrick-Prescott trend), and inflation. The logarithm of inflation is used to lessen the outlier effects of high-inflation periods. Henisz's (2000) variable on political constraints (*POLCONV*) is used to examine the impact of checks and balances in the government's decision-making process. The election year dummy is taken from the World Bank's *Database of Political Institutions*, described in Beck and others (2001). Finally, the IMF-supported program dummy variable was constructed using the program dates from the *History of Lending Arrangements* reported by the IMF's Finance Department and available through the IMF's external website (www.imf.org).

Table 3. Emerging Market Countries in Sample

Argentina	India	Peru
Brazil	Israel	Philippines
Chile	Jordan	Poland
China	Korea	Russia
Côte d'Ivoire	Morocco	Thailand
Colombia	Mexico	Turkey
Costa Rica	Malaysia	Ukraine
Ecuador	Nigeria	Uruguay
Egypt	Pakistan	Venezuela
Hungary	Panama	South Africa
Indonesia		

In deriving sustainable debt levels from primary surplus behavior, an appropriate interest rate is needed. This is constructed as the weighted average of external and domestic interest rates, with the weight being determined by the share of external debt in total public debt. For the external interest rate, we add J.P. Morgan's EMBI (Emerging Market Bond Index) spread for the various emerging markets to the U.S. long-term real rate, measured by the long-term government bond yield (from the OECD database), minus CPI inflation. The domestic real interest rate is drawn from the World Bank's *Global Development Network*

database. Where the EMBI spread was not available, a predicted spread is generated using *Institutional Investor* ratings (as in Reinhart, Rogoff, and Savastano, 2003). Specifically, we run a regression of EMBI spreads on (100 minus *Institutional Investor* rating), with linear and quadratic terms allowed, since the relationship seems to be nonlinear. Two EMBI outliers (Russia 1999 and Argentina 2002) were dropped from the estimation. The fitted regression is then used to generate predicted spreads for observations with no EMBI data.

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