

## APPENDIX 6

# Debt Sustainability Analysis

The IMF's Policy Development and Review Department (PDR) has recently proposed a methodology to assess the fiscal and external sustainability of a country, which has become a standard template for such analyses within the IMF.<sup>1</sup> A relevant question to ask for evaluation purposes is whether the proposed analytical framework, if available in late 2000, would have indicated a warning signal that Argentina's public and external debts were potentially unsustainable. In this appendix, we apply the World Economic Outlook (WEO) projections—presumably reflecting the best (albeit rather optimistic) information available to IMF staff—to the standard templates for fiscal and external sustainability analyses for the period 1998–2001, in order to see if the results of such exercises would have suggested a different course of action than the one actually chosen.

At the outset, two qualifications must be stressed. First, data requirements are quite stringent for both fiscal and external sustainability analyses, but particularly for sensitivity analysis in the fiscal sustainability template. Even with the benefit of several intervening years, it is still not possible to obtain accurate actual data for all the variables called for by the template. This means that considerable discretion and subjective judgments are involved in using the framework and interpreting its results. Second, the proposed methodology calibrates debt-stabilizing primary balances (for public debt sustainability) and debt-stabilizing noninterest current account balances (for external debt sustainability), based on a given set of projections.<sup>2</sup> There is, however, no consensus on what the sustainable level of debt would be for a given country, hence what primary or noninterest current account surplus would be needed to prevent the debt from reaching that level. The notion of sustainability thus remains inherently subjective.

In what follows, we will present the results of sustainability analyses, with the appropriate modifi-

cations and adjustments of WEO projections as inputs (the basic scenario).<sup>3</sup> Several sensitivity analyses were also performed, using a combination of projections positing an adverse shock of two standard deviations from historical average for each key variable at  $t + 1$  and  $t + 2$  and a real one-time depreciation of 30 percent at  $t + 1$ .<sup>4</sup> These results are not reported here because the basic scenario has yielded sufficiently illustrative results for our purpose, but the results of the basic scenario are compared to those obtainable from using consensus forecasts.

The accompanying figures will show, for each scenario, a profile of debt-stabilizing balances that were consistent with the projections made at WEO forecast points (i.e., May and October of each year); these balances are constant “steady-state” surpluses that would stabilize the relevant debt to GDP ratio at its  $t + 5$  projected value, assuming that the key variables also remain at their  $t + 5$  projected values. A steady-state surplus can be interpreted as the adjustment effort required to stabilize the debt, relative to the country's historical performance.

## External Sustainability Analysis

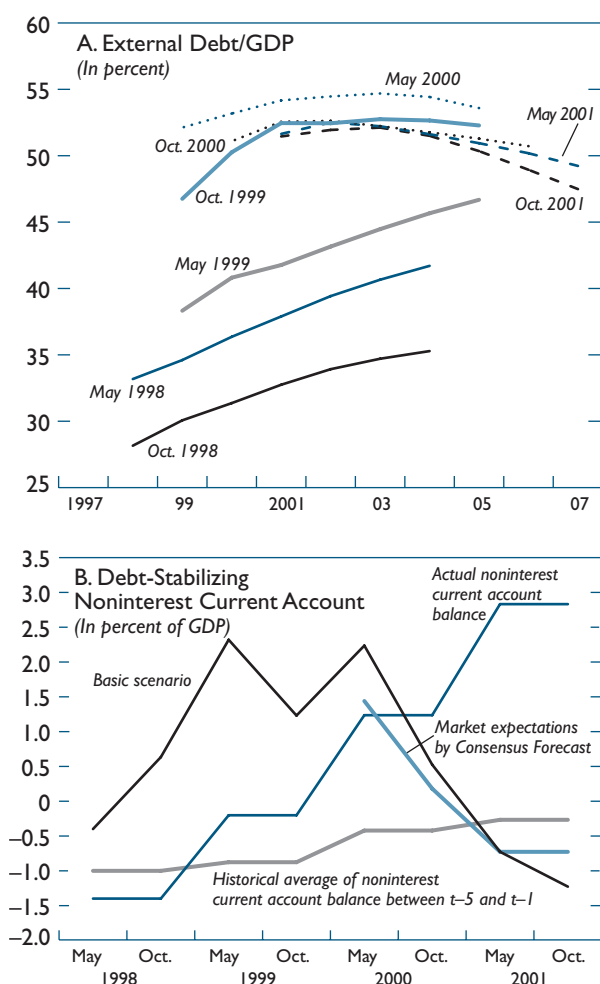
Figure A6.1 summarizes the results of external sustainability analysis. Panel A indicates the eight profiles of the external debt-to-GDP ratio that are implied by the eight respective sets of WEO projections for the key variables. It is worth noting that an earlier WEO forecast (e.g., May 1998, October 1998, and May 1999) yielded a gradual rise in the debt ratio from a relatively low level, while the later forecasts yielded a gradual decline from a relatively high level. PDR suggests a benchmark of 40 percent, at which point the conditional probability of crisis

<sup>1</sup>See “Assessing Sustainability,” SM/02/166, May 2002; and “Sustainability Assessments—Review of Applications and Methodological Refinements,” SM/03/206, June 2003.

<sup>2</sup>The template also calibrates public sector and external sector gross financing needs consistent with the projections.

<sup>3</sup>For the modifications and adjustments made, see the annex to this appendix.

<sup>4</sup>The key variables are: (for fiscal sustainability analysis) real GDP growth, real interest rate, and primary balance in percent of GDP; and (for external debt analysis) real GDP growth, nominal interest rate, dollar deflator growth, noninterest current account in percent of GDP, and nondebt inflows in percent of GDP.

**Figure A6.1. External Debt Sustainability**

Sources: IMF database; and Consensus Economics, Inc.

becomes about 15–20 percent.<sup>5</sup> According to Panel A, Argentina's projected debt-to-GDP ratio consistently exceeded the critical 40 percent for most of the period. If we consider the actual level of 50 percent at the time of the crisis in 2000–01 as the benchmark, the template would have sounded alarm from October 1999 onward.

Panel B depicts a profile of the debt-stabilizing noninterest current account balances consistent with the WEO forecasts at each forecast point. For example, the balance of about 0.5 percent of GDP in October 2000 meant that a surplus of that magnitude was required to stabilize the external debt to GDP

ratio at 50.7 percent of GDP (from  $t+5$  onward). In contrast, the historical average balance was a deficit of more than 0.5 percent of GDP. This means that a turnaround of more than 1 percent of GDP was required (relative to past performance) in the noninterest current account balance. The required surpluses derived from the WEO projections were quite similar to those derived from the consensus forecast.

While the required surpluses suggested in 2000 may not seem so large, at least two qualifications must be kept in mind in interpreting this result. First, by the fall of 2000, the WEO projections had already incorporated the assumption of declining external debt-to-GDP ratios. If the May 2000 WEO projections had been used, the template would have indicated a required turnaround of more 2.5 percent of GDP. Second, the stabilizing debt level of 50 percent of GDP was high for any country, but particularly for Argentina, given the likely overvaluation of the peso. With the sharp depreciation of the peso against the U.S. dollar, in the event, Argentina's external debt-to-GDP ratio rose to over 140 percent in 2002.

### Fiscal Sustainability Analysis

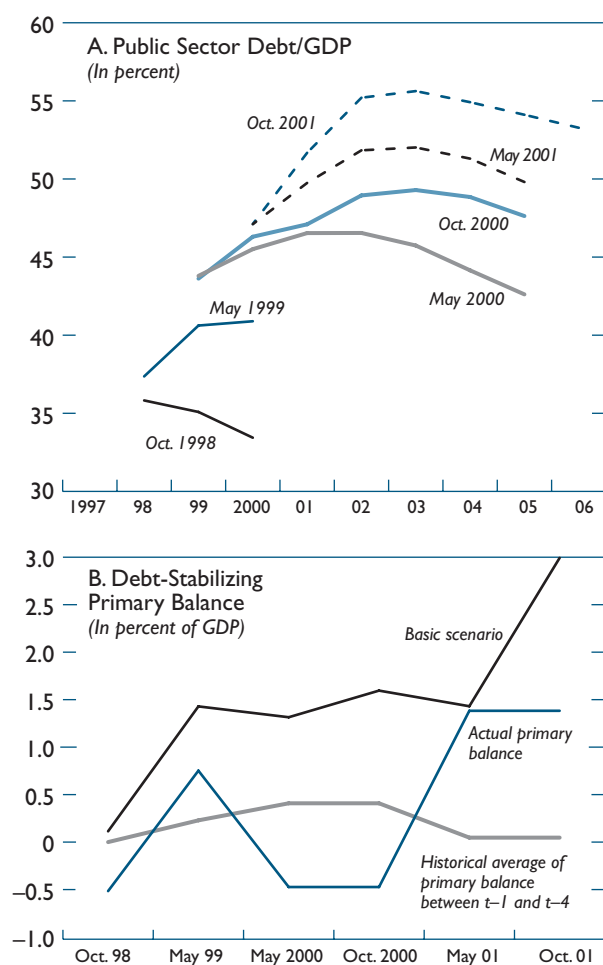
Figure A6.2 summarizes the results of fiscal sustainability analysis. Panel A indicates the six profiles of the public debt to GDP ratio that are implied by the six respective sets of WEO projections for the key variables. It is worth noting that the earliest WEO forecast (October 1998) yielded a projection showing a steady decline in the ratio, while the next forecast (May 1999) yielded a gradual rise in the projected ratio from a relatively low level. In each projection, the debt-to-GDP ratio stabilized over the forecast horizon (meaning that the WEO projections incorporated the assumption of debt sustainability, that is, sufficiently strong fiscal action from  $t + 1$  to  $t + 4$ ), but the profile kept shifting up for each projection.

Panel B depicts a profile of the debt-stabilizing primary balances consistent with the WEO forecasts at each forecast point. For example, the primary balance of 1.6 percent of GDP in October 2000 meant that a primary surplus of that magnitude was required to stabilize the public debt-to-GDP ratio at 47.6 percent of GDP (from  $t + 5$  onward), while the primary balance was barely in balance over the past five years, and the actual balance for that year turned out to be a deficit of about 0.5 percent of GDP.

Fiscal sustainability analysis is difficult to interpret because the critical benchmark for sustainability is not known. It turns out that what exploded the debt-to-GDP ratio in Argentina was a sharp depreciation of the peso associated with an exit from the peg. As long as the sustainable level of debt was overestimated, and the extent of any exchange rate

<sup>5</sup>See "Sustainability Assessments—Review of Applications and Methodological Refinements," SM/03/206, June 2003.

Figure A6.2. Public Debt Sustainability



Source: IMF database.

overvaluation (or any overshooting in the event of an exit) was underestimated, debt sustainability analysis would have been of limited use in late 2000.

## Annex on Data Modifications and Adjustments

Several modifications and adjustments were made to the data. First, our own estimates were used when no forecasts were available. For foreign-currency-

denominated public sector debt, amortization of medium- and long-term public sector debt, short-term public sector debt, and interest payments on foreign-currency-denominated debt, we used their latest available shares relative to total debt and applied the ratios to the projected total debt. For privatization receipts, recognition of implicit or contingent liabilities, cost of bank recapitalization, and local-currency-denominated external debt (excluding exchange-rate-linked debt), we assumed zero for the entire period.

Second, fiscal sustainability analysis requires gross public sector debt projections, but WEO only provides net public sector debt projections. Consequently, we used gross debt projections as provided in the program reviews, ignoring the occasional mismatch in timing between the WEO projections and the program reviews. When the program reviews do not provide five-year projections, the last available projections were used.

Third, a market consensus is taken from the April and October issues of the *Latin American Consensus Forecast*. The consensus forecasts, however, only provide projections for real GDP growth, exchange rate appreciation, consumer price index (used in place of GDP deflator), and the current account balance. For the nominal external interest rate, real and nominal interest rates on public debt, and net non-debt creating capital inflows, the WEO projections were used. As the consensus forecasts for exchange rate appreciation are only available for two years, the projections for subsequent years were assumed to have zero percentage change.

Finally, our exercise yields results that are different from those of a similar exercise performed by PDR comparing early 1999 program projections with actual outcomes.<sup>6</sup> The main difference is that the PDR exercise uses GDP data for historical years that already incorporate subsequent data revisions. Our exercise, as noted, consistently uses the WEO projections where available, supplemented by other projections that can be reasonably thought to have been available at each forecast point—consistent with our focus on the information available to staff and the authorities at the time.

<sup>6</sup>As reported in "Assessing Sustainability," SM/02/166, May 2002; and "Sustainability Assessments—Review of Applications and Methodological Refinements," SM/03/206, June 2003.