

## Sustainable borrowing

*Q. 8.05. What are longer-term considerations in debt issuance?*

Debt is not transitory. Once it is issued, it will impose a continuing burden on the state budget through interest payments and the eventual repayment of principal. It is critical that the growth of sovereign indebtedness over the long run not outstrip the state's ability to meet its financing obligations or impair other spending.

If appropriate caution is not given in structuring the debt portfolio, the sovereign may create macroeconomic adversity for the economy. Piling up too much debt to mature at the same time may provoke market dislocations about by the market's inability to absorb or buy sufficient debt to pay off the maturing issues. Carelessness about interest rates can make the existing debt too expensive by draining a disproportionate share of government receipts into debt service. A similar problem can develop when debt is issued in foreign currencies and the risk of exchange rate shifts is ignored. Again, the debt may become too expensive to maintain as foreign reserves are drained to pay servicing.

These hazards – funding risk, interest rate risk, and exchange rate risk – should be kept in mind in planning debt issues. The crises that may provoke them may not be always foreseen, but the likely impacts of such events can be modeled and, to some extent, mitigated.

*Q 8-05.01. What is the nature of funding risk?*

Funding risk is the possibility that the state will not be able to fully fund new cash needs or to rollover existing debt or may not do so at acceptable terms. The problem may be a question of volume if the cash need is too great at one point in time or it may be an issue of refunding if the government is unable to rollover its maturing obligations.

*Q 8-05.02. What are the elements of funding risk?*

The issues to analyze regarding funding risk regard resources available and the possible demand placed upon them.

- Funds available to service debt: it should be determined how sensitive to economic conditions is the net fiscal deficit, excluding interest payments. Of particular note is the impact of the portfolio structure and interest rates. The more the portfolio is tied to current interest rates, by being mostly short-term debt or by depending upon floating rate notes, the more tightly the interest payments on the debt will be linked to current market conditions.

- Funding risk exposure: it is important to know the size of the current and projected fiscal deficit and the need for net new funding. Funding risk is reduced if principal payments due are more evenly debt spread over the coming several years or decade. It is even more important to keep these payments small relative to the typical volume of debt issued in that country's capital markets.
- Market risk exposure: not just the size of the debt, but its composition can have an impact. It matters what is the currency composition of the country's source of funds available to service debt, particularly if that source varies with market conditions. One should analyze how economic and market conditions affect the sources and uses of funds in each currency used for servicing debt.
- Credit risk: one should look for counterparties in swaps or related transactions, contingent obligations yet to be exercised and on-lending contracts. Each of these may increase the funding challenge.

*Q 8-05.03. How can one model funding risk?*

To model the risks in fiscal flows, develop a comprehensive picture of the resources of the government with an adequate of key fiscal flows. These will be used to develop a simple cash flow model.

Funds flows can be divided into three categories: material flows that may have discernible patterns, material flows that are set administratively, and nonmaterial flows.

- For the first group, statistical modeling is needed using historical data. This is likely to include flows such as tax payments. Tax payments may require additional modeling to account for elasticities of flows; varying rates or macroeconomic cycles may not generate linear responses in receipts. Similar questions are asked about the responsiveness of the funds to service debt with respect to market interest rate changes.
- For the second group, accounting records and calendar functions should reduce a large part of the variability in daily cash flows. These flows would cover, for example, debt maturities and salary payments.
- For the third group, the smaller flows may be as well modeled as "white noise."

*Q 8-05.04. What can be done to model interest rate risk?*

Forecasting interest rates into the future is a waste resources; the variety of views about future interest rates drives the market mechanism itself. A better use of effort is to model the impact of interest rate outcomes on the cost of financing a portfolio.

Explicitly model the risks in interest rates. The larger the share of the state's debt outstanding that is not issued as floating rate notes, the less volatile will be the value of financing charges. If debt is issued as long-term fixed rate debt, financing costs will not be as volatile as the rates themselves. Detailed models of financing costs tied to debt outstanding permit a more accurate assessment of interest rate impacts.

*Q 8-05.05. How can simulation models be of value?*

Monte Carlo or other simulation methods can be used to test the resilience of the portfolio and financing costs under stress conditions. The difficult part is to develop realistic risk scenarios. Too often, realism is sacrificed for ease of statement.

The danger is that simple-minded stress tests, for all their ease of statement, may not be as informative as supposed. Further, poorly chosen stress scenarios may provide an unwarranted sense of security.

Stress scenarios in simulation should be drawn with an eye toward history rather than easy numbers. For example, many interest rate models have blithely assumed a 100 basis point parallel shift of the yield curve or a 10 percent increase in funding needs. If such events are either too common or too rare, it is not a good test. Risk scenarios should be chosen from the extremes of situations actually experienced.

In this case again, it should not be assumed that the world is Gaussian. It is better to look hard at the underlying distribution of the events to be modeled.

*Q 8-05.06. How is complexity useful to simulation models?*

In modeling each macroeconomic risk area, one should define a clear relationship between the portfolio and the risks of concern. It should not be assumed that risks are going to be independent of each other. Among several of the risks, there is the possibility that they may act in consort. For example, a deteriorating exchange rate may drive inflation if imports play a major role in the economy.

*Q 8-05.07. How complete must simulation models be?*

It is imperative that the models be exhaustive in considering portfolio risks. A good model may address all of these risks.

- Currency issues. If any debt is issued in foreign currencies, this is an essential risk to include.
- Interest rates. These will affect rollover debt, but should not be modeled as if all debt service costs will move with market rates at once unless the portfolio depends heavily on floating rate notes.
- Inflation. In measuring the impact on inflation-linked debt, one should consider both the impact of realized inflation and the far more difficult issue of inflationary expectations.
- Fiscal flows are probably the most overlooked risk. How much do the state's fiscal flows depend on the business cycle? How does the speed of variations in the fiscal flows compare with the speed with which the state can adjust its debt issuance plans?