Measuring Cost

Q 7-02. What questions arise regarding the cost of debt?

Although many debt offices proclaim a goal of "lowest cost of borrowing," it is not immediately clear what this actually means. Cost may be measured in many ways and the differences among those definitions can lead to very different policies. The superlative "lowest" implies an explicit comparison among possible interest regimes in the measurement.

Cost may be measured as relative to a point of reference. The reference may be to all other points on the sovereign yield curve or to corresponding points on some other yield curve. It is also possible to measure cost as a sum. An example would be minimizing the total cost of borrowing over a period. In order to have a comparison, some standard time period or the costs for a previous period, normalized for shifts in the yield curve, must be used.

Q 7-02.01. How do cost comparisons based on a reference point affect planning?

Lowest cost of financing may refer to the average rate paid on outstanding debt relative to other points along the yield curve. Because the yield curve is generally upward sloping, however, this would encourage issuing debt at the shortest end of the curve with a consequent rollover risk exacerbated by increased frequency of rollover.

For many private firms, lowest cost is measured relative to the interest rate for issues of the same tenor by some benchmark entity. Since the sovereign debt yield curve is the proxy for a risk-free rate in most economies, this interpretation has no meaning. If, however, sovereign debt is not considered the risk-free proxy, other risk mitigation actions in the debt management office are required.

Lowest-cost-by-reference can also be measured by comparison against the spread to a larger international creditor such as Germany or the United States. It is important in this case to match carefully to the same type of security. Nominal fixed rate notes should be matched to nominal fixed rate notes of the same tenor. Particular care is required to avoid matching fixed rate nominal notes in the reference country to inflation-linked or floating rate securities. This would most likely vastly understate the actual spread and may seriously understate the cost of bearing the additional market or inflation risk by the government.

Q 7-02.02. How do cost comparisons based on cash flow affect planning?

Lowest cost may be measured instead as a sum of cash expended in debt financing. An example would be minimizing the total amount paid to finance borrowing over a

period. In order to have a comparison, some standard time period or the costs for a previous period, normalized for shifts in the yield curve, must be used.

Using cost as a sum, the measurement can be taken in absolute terms, such as the total cost of financing, or in relative terms, such as financing cost as a share of total government expenditures or as a share of GDP or as relative to the total debt outstanding. Again, shifts in the yield curve must be accounted for to maintain a consistent measurement.

Given that exogenous shifts in the yield curve or exchange rates have been accounted for, using total expenditures as a cost comparison will benefit debt management by focusing attention on the resources being used to finance a debt, which may prompt consideration of what resources are available. This is the key to establishing the sustainability of a debt position.

Q 7-02.03.   How has cost minimization been enhanced as a goal?

Many debt management offices (DMOs) use a more complete concept in stating their debt management goal. For these organizations, the goal is the minimization of borrowing costs *subject to acceptable risk.*

This adds the burden of specifying what an acceptable risk is. In many polities, this decision is the domain of elected representatives, although they may not want to be forced into specifying an actual risk level.

Q 7-02.04.   Can one achieve continuous cost minimization?

The cost minimization goals described above are far more likely to be achieved over an extended period on the average than constantly at each moment. It is unrealistic to attempt to minimize borrowing costs at each instant of time.

If one is measuring cost minimization by reference to other values, such as other points on a yield curve, one must be prepared to restructure the entire portfolio of outstanding debt instantaneously as the reference points respond to exogenous factors. For example, if the standard is relative to other points along the yield curve, flattening or steepening or even inversion of the yield curve may provoke complete restructuring of the portfolio to maintain continuous minimization.

If cost minimization is interpreted relative to cash flows, the same restructuring of the portfolio is required to address constantly changing situations. Consider a portfolio managed under a "Markowitz" portfolio optimization model with the portfolio chosen along an efficient frontier given a decision-maker's risk appetite. The two axes (corresponding to risk and return) may be defined as total cost per day of financing for each portfolio and the variance of that cost. Unless one is willing to

assert that the cost variance is completely constant, the efficient frontier will move slightly with changes in the underlying variance. This will again require shifting the entire portfolio. The challenge is doubly difficult as there is no guarantee that adjoining portfolios on the frontier are close in composition.

Q 7-02.05.   What is a key intellectual challenge in optimization of state debt?

The common problem with these measures, however, is that all that can be said about them is that the variable of choice can be observed at any point in time to be less than or greater than some reference value. There is no practical way to declare that they have indeed been kept at the lowest possible value. Optimization or minimization is measured against observable, or identifiable, alternate states of the world. As history has but one realization, whatever resulted is the only outcome. There is nothing to compare it with and comparisons on counterfactual propositions are unproductive.

Q 7-02.06.   What questions relate to timing and volume of issuance?

That a deficit must be financed implies that by the end of an accounting period, the state cash balance must be at least zero. In some countries, the relevant accounting period is each day; for others, a longer period is used. In either cash, the debt management goal is to maintain a cash balance at the close of the period.[1]

This provokes two questions of interest to the debt manager, viz., what is an adequate cash balance? Moreover, how much should be allowed for variability in the cash forecast within the period until going to the market to borrow again? These questions are similar to issues related to managing inventories such as reorder point formulas and a similar reasoning may be applied to debt management.

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[1] To avoid cumbersome language, the text will assume that the accounting period is daily. If a longer period is used, the text can be adjusted accordingly.