What is the Average Maturity of the Brazilian Public Debt?

This highlights the fact that the "average maturity" of the Brazilian Federal Public Domestic Debt is computed using a concept close to the Macaulay duration, i.e., an average of the complete cashflow of the debt, rather than the more traditional average of the time to the payment of the principal of each bond. The current methodology is useful for refining the debt management and reducing cash-flow risk, but is obviously more conservative than the traditional one. This is particularly so in the case of Brazil, where interest rates are still high and coupons large. While the current methodology points to an average maturity of 27.6 months, the more traditional methodology points to an average maturity of 40.5 months. The difference has become more significant in the last 18 months, as the share of long-term bonds continued to increase as part of the strategy of improving the composition of the Public Debt. The figure from the traditional methodology can be useful for cross-country comparisons.

Introduction

The Brazilian economy has shown great progress in the last two years. The debt/GDP ratio dropped, the trend of increasing taxes and expenditure was broken, inflation converged to 5%, and exports increased by more than 25% two years in a row. Nonetheless, in part because of legacy costs, there are still concerns about some fiscal variables, notably those related to public debt.

Debt management is a responsibility of the National Treasury, which continues to invest heavily in its improvement. This effort has helped the issuance of nominal debt of increasing maturity, the almost complete elimination of the dollar exposure of the domestic debt, and, more recently, a gradual reduction in the roll-over rate of the external debt to close to 75%. Hence, in three years, the debt composition changed quite dramatically. The National Treasury also continues its efforts to improve communication with markets and to refine statistics, models and strategy, with a view to provide maximum predictability and transparency to investors.

One important change occurred in 2003 was a refinement of the way the average life of the federal public debt was computed. Specifically, the National Treasury started to present the *average life* of the debt, i.e., the weighted distribution of cashflows associated with the debt, rather than the traditional weighted average of the distribution of payment of the principal of each bond.[1]

Both methodologies are used, in a more or less explicit way in different countries. Back in 2001, the National Treasury conducted a survey, which showed that some countries prefer to present the "average life", which typically does not include the coupons, while others present the "average remaining life", which typically include the coupons (the classification is not always consistent).

[1] This latter methodology was applied to the external debt until 2003.

The motivation for the current methodology and an illustration of its impact

The methodology adopted by the National Treasury is particularly useful for debt management purpose, because it is focused on one of the priorities of the National Treasury, i.e., to minimize the volatility of cash flows (this is why it systematically uses Cashflow-at-risk models in planning its issuance schedule). However, this methodology can be very conservative and possibly misleading for cross-country comparisons.

The conservative aspect of the *average remaining life* figures released by the National Treasury in 2003 has been felt with particularly strength as the proportion of long-term bonds increased. This conservative bias meant that few could perceive the full impact of the increased share of medium-term fixed rate bonds (NTN-F 2008, NTN-F-2010, NTN-F-2012), or of bonds such as the IPCA-linked NTN-B-2045. The reason is that interest rates in Brazil are still high, and hence the weight of coupons is quite high in Brazil.

This phenomenon can be illustrated with a simple example, which considers a portfolio comprising two NTN-F, both of face value of 1000 and coupons of 10%. Suppose that the first NTN-F has a maturity of 60 months, while the second one a maturity of 180 months.

The average maturity of this portfolio according with the traditional methodology would be of 117 months, assuming a discount rate of 14%.[2] On the other hand, the maturity of the same portfolio, using the more conservative methodology, currently adopted by the National Treasury, would be of just 65,9 months.

Average Maturity According with Current and Traditional Methodology

While the current methodology of the National Treasury indicates an *average remaining life* for the Domestic Public Federal Debt DPMFi of 27.4 months, the more traditional and used methodology would indicate an *average life* (average maturity) of 40.5 months.

The 50% increase in the resulting maturity of the domestic debt arises simply from considering the average time to *maturity* of each bond (i.e., payment of the principal), weighed by its (discounted) volume, rather than the weighed average time of every cashflow (principal + coupons).

The reason this difference has become so important in the last two years owes to the increasing weight of long-term debt such as the NTN-B and NTN-C in the overall domestic debt. The stock of NTN-B and NTN-C has risen to R$ 110.9 billions (12.2% of the domestic debt).

According with the current methodology, the average maturity of the portfolio of NTN-B and NTN-C would be of 74.2 months.[3]. On the other hand, the traditional methodology would indicate an average maturity of 146.5 months. Simple arithmetic would show that just this factor would increase the average maturity of the overall domestic debt from 27.4 months to 36.5 months (roughly 12% x 70 months= 9 months).

[2] The average maturity would be of 120 months if the average used the face value and not the discounted value, a methodology also adopted by some issuers.
[3] Data from August 2005.

	Average Maturity (months)		
	Stock (Aug/2005)	Current Methodology	Methodology # 2
NTN-C/NTN-B	R$ 110.9 bn	74.2	146.5

As mentioned, in most cases the exact methodology used for computing the average maturity of the public debt is not easily found. As an illustration, however, one can compare the more familiar figure of the maturity of the Brazilian domestic federal public debt (27.6 months), with the one that arises from the more traditional methodology (40.5 months), which considers only the time to the payment of the principal of bonds.

	Average Maturity (months) Domestic Debt on	
Turkey	21.6	Aug/05
Philippines	34.8	Jun/05
Mexico	37.2	Aug/05
Poland	38.4	Feb/05
Hungary	79.2	Aug/05
India	157.2	May/05

Source: DresdnerKW

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