Debt Sustainability

Author: **Mirela Anca Postole,** Titu Maiorescu University Bucharest, Romania, anca.postole@yahoo.com

In the conducted research the author started form the reality according to which debt sustainability, in general terms, refers to the capacity of a state to consistently pay off its debts, internal and external, contracted as subjects of both public and private law, without impacting the growth and economic development perspectives. The main risks involved in the management of sovereign debt are analysed. The author also approaches aspects regarding the main sustainability indicators for debt, as these are the most frequently used coefficients for debt management.

The results of the research point out a significant conceptual problem referring to the distinction between the reimbursement problems of the debt generated by the dramatic decrease of liquidities and those determined by insolvability.

Keywords: *debt sustainability; liquidity; solvability; debt risks; sustainability indicators*

Classification JEL: *H61; H62; H63*

Introduction

In the debate regarding debt sustainability there is no mention made to debt management, it is only stated that a careful selection of debt instruments is necessary to control payments for interests and debt accumulation.

In countries with a high level of debt where interest payments take up a significant part from the budget's returns minimizing debt costs is extremely important. It is also important to avoid the risk of unfavorable shocks on economic growth or production increase which could bring the debt at an unsustainable level.

The optimal debt structure derives from a specific analysis of the relative impact of risk and costs of alternative debt instruments on the costs induced by a possible failure on reaching the stability objective. This allows for a risk quantification considering the foreseen costs for the debt service and, of course, by identifying the optimal combination through the calibration process between cost and risk minimization. Debt establishment is done by low cost financing and by the emission of instruments that ensure protection for debt percentage variations determined by lower than predicted rate of inflation and increase of production. For example, bonds indexed with inflation insure protection against variations in the debt percentage determined by a lower rate of inflation then predicted. Fixed interest bonds (unlike short term bonds) contribute to the stabilization of the debt percentage by cyclic decreases if between the rate of interest and the rate of production we have a negative correlation.

In practice if debt sustainability is generally ensured by a restrictive fiscal policy, the minimization of estimated costs for the debt service becomes less important.

Aspects on existing debt sustainability studies

Liquidity variables, measured with respect to ratio of short term debt service and reserves continue to be very important to different specifications of the model and stress tests, which does not apply to other variables. Reinhart (2002) used such a large sample for the study of the prediction power of sovereign financial evaluations with regard to monetary crises and situation of external debt cease of payments. Considering the framework provided by the „signal theory" and by using a sample of 59 countries between 1970 and 1999 a strong connection between monetary crises and cease of debt payment was discovered in developing countries: approximately 85% of all situations for cease of debt payment are related to monetary crises[1]. Another major find refers to the fact that sovereign financial evaluations systematically fail to foresee monetary crises, but are quite efficient in foreseeing situations of debt payment incapacity which these determine.

The indifference toward the constant increase of public spending has attracted budget imbalances and a modification of the public debt. Some of the causes for the budget deficits are: constantly increasing spending for maintaining government functioning; constant increase in spending for payment of the public debt (part of this generated by the financing of budget deficits in the previous years); drastic increase of inflation; high expenses which didn't prove to be productive and others factors (Gherghina, Mosteanu, Lacatus, 2010).

Although the studies try to establish if debt generated crises can be predicted and if so, which are the relevant indicator for this, a series of more complex aspects for evaluating debt sustainability are not covered, especially those regarding to the fixing of adequate threshold values for

[1] In this study monetary crises were identified by crisis indicators developed by Kaminsky and Reinhart (1999), while incapacity of debt payment was established using cases documented by Beim and Calomiris (2001), Detragiache and Spilimbergo (2001) and others. In the sample used for the analysis of the relation between situations of cease of debt payment and monetary crises we find 106 situations of debt payment incapacity and 154 monetary crises, 135 of these on emerging markets.

different indicators of sustainability, this finally leads to a limited knowledge horizon[2].

In this context, studies done by the International Monetary Fund and the World Bank with regard to debt sustainability in poor countries with a high degree of indebtedness could seem more relevant, despite the fact that the methods used and the evaluations done for poor countries might not totally apply in the case of emergent countries. As mentioned in a 1996 study from the IMF the ratios between incomes form exports and the actual debt service and/or the net actualized value for all service payments of a future debt have been selected as direct indicators of external sustainability. Also levels of 20-25% and 200-250% for these indicators were recommended as thresholds that once passed would involve significant difficulties in accomplishing the debt service. These thresholds are probably based on empiric analysis of experience for emerging countries and on accomplished performances for meeting the debt service in a certain time period; the purpose of this empiric analyses seems however to be limited considering the small number of countries included in the sample[3].

Defining concepts for debt sustainability

It is useful to start the definition of debt sustainability considering it as a situation in which the debtor is capable of continuing its debt service with no unrealistically large balance correction for income and spending. Sustainability excludes the following situations: situation in which debt restructuration is already necessary (or is anticipated to be necessary); situation in which the debtor continues to accumulate debt on an unlimited period, at a higher rate than the debt service capacity (Ponzi game); or the situation in which the debtor activates beyond its own limits, accumulating debt while knowing of the necessity for a debt

[2] For monetary crises, many of the studies used on the large scale the „signal theory" or „indicator theory". Among others see Frankel and Rose (1996), Goldstein, Kaminsky and Reinhart (2000), Kaminsky, Lizondo and Reinhart (1998).
[3] For more details see Underwood (1990) and Cohen (1995).

restructuration that will allow payment (even when there are no internal changes).

The debt dynamic involves the existence of several closely related concepts:

- **Solvability** – An entity is solvent if the actualized value (AV) of current primary and future spending is not higher than the actualized value of its present and future income sources while detracting all initial debts.
- **Liquidity** – An entity has no liquidities if all its liquid actives and available funds are not enough to meet payment obligations for matured credits, even if the solvability condition is met.

The distinction between solvability and liquidity is sometimes difficult to make as the lack of liquidities may be manifested by increasing interest rates in the extreme case when there are no available funds, so the marginal rate of interest becomes infinite this in the end questions the entities solvability.

Considering all of the above it is useful to define:

- **Sustainability** – Payment obligations for an entity are sustainable if they cover the updated value of the budget constrains without any major corrections in the income and expenses balance considering market financing costs.
- **Vulnerability** – Vulnerability is simply the risk that the liquidity and solvability conditions are broken and the debtor could be confronted a crisis.

Measurement instruments for debt sustainability

There are generally two methods for determining the level of sustainability for a country. One of the methods refers to a medium term macroeconomic comprehensive model, specially focused on fiscal aspects and generate by payment, while the other covers the evaluation of

different types of risks associated with debt and monitoring the evolution of the percentage for debt sustainability over time.

Macroeconomic model

The macroeconomic model is constructed within the Management of Actives and Passives and is centered on minimizing cost for borrowing subjected to establish risks or minimizing risks associated to established costs. The benefits for such a model are quite obvious, in the sense that it can be used not only in debt management but also for determining the optimal growth, fiscal profiles or medium term payments balance. However developing such models implies not only a huge amount of data but also a high level of expertise form the developers and this could imply a series of constrains for emerging countries.

Types of risks associated with debt

This method constitutes a frame which allows for the identification and evaluation of financial and operational risks for the management of the external debt. Risks can be divided into three categories:

A. External market based risks, these include:
- Liquidity risk;
- Rate of interest risk;
- Credit risk;
- Foreign currency risk;
- Convertibility risk;
- Fiscal/budget risk.

B. Operational and management risks, such as:
- Operational risk;
- Failure of control systems;
- Financial error risk.

C. Country specific and political risks

Table 1

Types of risk	Description
Market risk	Refers to risk associated with price changes in the market, such as: interest rates, currency exchange quotations, prices for basic materials, costs with service debt. For the two types of debt, internal or external, interest rates changes influence cost for the debt service when the fixed rate debt is refinanced. The floating rate debt also changes when the rate frequencies change. The short term debt with a fixed rate is considered with a higher risk than the long term debt with a fixed rate. An excessive focus on the long term debt with a fixed rate can involve risks when future financing requirements are uncertain.
Refinancing risk	The risk that the debt will be refinanced at increased costs, and in extreme cases not refinanced. In the situation when the refinancing risk is limited to the risk at which the debt could be refinanced at a higher interest rate, this could be considered a type of market risk. This could lead to supplementary real economic losses, as opposed to the purely financial effects of higher interest rates, but most of the times this problem is handled separately. Managing this risk is extremely important for countries with emerging markets.
Liquidity risk	There are two types of liquidity risks. The first refers to the costs that investors face trying to get out of a situation when the number of buyers has decreased significantly or due to the lack of activity on a

	certain market. This type of risk is highly relevant when debt management includes liquid actives management or usage of derivate contracts. Another type of liquidity risk, for a debtor, refers to the circumstances when the liquid actives volume can diminish very fast faced with unexpected bond flow, as this can lead to difficulties in cash flow by borrowing in a short period of time.
Credit risk	The failure risk for debtors on loans or on other financial actives. This risk is very important when debt management includes liquid actives management.
Payment risk	A possible loss for the government as partner for not paying debt, for no other reason than payment incapacity form a different party.
Operational risk	This includes different types of risk, including transaction errors in different stages of operation execution and registration, inaccuracies or stops in the internal control activity or in systems and services, law related risks, breach of security or natural disasters that affect economic activity.

Source: International Monetary Fund/ World Bank - Guidelines for Public Debt Management, March 21, 2001

Sustainability indicators

Debt sustainability indicators are the most commonly used coefficient in debt management. These indicators express unpaid external debt and the

debt service as a percentage for the gross domestic product or form other variables that express economic growth. Some of the most used indicators for debt sustainability are shown in the table below:

Table 2

DEBT SUSTAINABILITY INDICATORS	
1. Solvability coefficients	Interest service ratio – ratio between interest payments to export of goods and services (XGS)
	External debt to GDP ratio
	Ratio between external debt and exports
	Ratio between external debt and incomes
	Ratio between the present value of debt services and GDP
	Ratio between the present value of debt services and the exports
	Ratio between the present value of debt services and the revenues
2. Liquidity monitoring coefficients	The primary debt services coefficient – ratio between total debt services (interest plus repayments of principal) and export of goods and services (XGS)
	Cash - flow coefficient for total debt or total debt services coefficient (for example the ratio of total

	debt services to XGS)
	Ratio between interest payments and reserves
	Ratio between short term debt and export of goods and services XGS
	Import cover ratio - Ratio between total imports and total foreign exchange reserves
	Ratio between international reserves and short - term debt
	Ratio between short - term debt and total debt
3. Indebtedness coefficient	Ratio between total external debt outstanding and GDP
	Ratio between total external debt outstanding and exports of goods and services
	Ratio between debt services and GDP
	Ratio between total public debt and budget revenue
	Ratio between concessional debt (debt resulted for credits contracted under preferential conditions) and total debt
4. Debt structure indicators	Rollover ratio- ratio of amortization (repayments of principal) to total disbursements
	Ratio between interest payments and total debt

	services
	Ratio between short - term debt and total debt
5. Public sector indicators	Ratio between public sector debt and total external debt
	Ratio between public sector debt services and exports
	Ratio between public sector debt and GDP
	Ratio between public sector debt and revenue
	Average term for a non-concessional debt
	Ratio between debt in foreign currency and total debt

Sources: Raj Kumar (1999) and IMF (2003)

External public debt sustainability is reflected mainly by the indicator "debt service rate", which is the ratio between the External Public Debt Service (EPDS) and the export of goods and services; this shows what amount of the export incomes covers payment of the debt service for a year (Gherghina, Cretan, 2012).

Conclusions

At a more general level, sustainability evaluations must be stated using strategy variables (such as expenses or tax rates) as well as using endogenous variables (such as interest rates of growth rates), but this central projection involves certain risks.

For example the income and expenses balance can become so offset that the debt dynamic would no longer be sustainable. This situation could lead, form the income perspectives, in a decrease of the growth rhythm or in not favorable evolutions on the export markets. In the expenses perspective there could be increases in costs, which would be difficult to avoid (such as demographic changes which impose supplementary pressure on sub financed social systems).

We can consider a country at a sustainable debt threshold if it can fully cover its obligations for external debt payments present and future without debt restructuration or overdue debts without compromising economic growth. Form an analytic perspective there are three determining key factors for debt sustainability: existing debt stock and its terms of payment; development of fiscal and external reimbursement capabilities of a country; structure and conditions for new external financing.

References

[1] Beim, David O. and Charles W. Calomiris,/ *Emerging Financial Markets*, New York MacGraw-Hill, Irwin, 2001.

[2] Cohen, D.,/*The Sustainability of African Debt,. mimeo, Ecole Normal Superieure*, 1995

[3] Detragiache, E.; Spilimbergo, A. / C*rises and Liquidity - Evidence and Interpretation*, IMF Working Papers 01/2, International Monetary Fund, 2001.

[4] Frankel, J. and A. Rose, /*Exchange Rate Crises in Emerging Markets*, Journal of International Economics, November 1996.

[5] Gherghina, R., Cretan, G./ *Finante*, Editura Universitara, 2012.

[6] Gherghina, R., Moșteanu T, Lăcătuș C./ *Budget deficit and public debt in Romania a member state of the European Union*, Economica magazine, *Journal of economic-financial theory and practice,* nr.6(53)/2010, vol.1, pp.270-276

[7] Goldstein, M., G. Kaminsky and C. Reinhart,/ *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets*, Washington D.C., Institute for International Economics, 2000.
[8] International Monetary Fund and World Bank / Guidelines for Public Debt Management, march 2001
[9] International Monetary Fund / Assessing Sustainability, 28 May 2002
[10] International Monetary Fund / External Debt Statistics- Guide for Compilers and Users, IMF, Washington D.C., 2003
[11] Kaminsky G., A. Lizondo and C. Reinhart, /*Leading Indicators of Currency Crises*, IMF Staff Papers 45, No. 1, March 1998.
[12] Kaminsky G. and C. Reinhart, /*The Twin Crises: The Causes of Banking and Balance-of-Payments Problems*. American Economic review 89, No. 3, June 1999.
[13] Missale, A., Bacchiocchi, E./ *Managing debt stability*, Working Paper n. 5, Università degli Studi di Milano, 2005
[14] OECD / Advances in Risk Management of Government Debt,
[15] OECD Publishing no. 6, 2006
[16] Reinhart, C., /*Default, Currency Crises and Sovereign Credit Ratings*. NBER Working Paper No. 8738, January 2002.
[17] Underwood, J. /*The Sustainability of International Debt*, International Finance Division,The World Bank, mimeo, 1990.
[18] UNITAR / Management of External Debt: International Experiences and Best Practices, United Nations Institute for Training and Research (UNITAR) Best Practices Series No. 9, 2006