Análisis Económico
Núm. 44, vol. XX
Segundo cuatrimestre de 2005

Public debt sustainability. Notes on debt sustainability, development of a domestic governmet securities market and financial risks*

(Recibido: junio/04–aprobado: noviembre/04)

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Resumen

The paper focuses on debt management, and examines the concept of debt sustainability as defined by different authors and applied by the IMF. However, proposes a new definition and a different approach. Assessment procedures for the new approach are suggested as also some actions to develop a government securities market. In the last part, it proposes an interpretation of Mexico's 1982 and 1994-95 crises, as a result of two factors, the overlooking of basic financial risks and a poor conception of debt sustainability.

Keywords: debt management, debt sustainability, fiscal sustainability, financial markets, government securities, financial risks.
JEL Classification: G18, E63, E58.

* A first version of this paper was submitted to UNITAR, United Nations, for a Post-Workshop Publication after the workshop on "Domestic Debt Market Development" Organized by the IMF and UNITAR, U.N. in Baku, Azerbaijan, april 2004. The main aim of the workshop was to train Government Officials of the CIS-7 countries on debt management and domestic capital market development. See Foncerrada (2004). This new approach was first presented by the author at the 4th Inter-regional Debt Management Conference, organized by UNCTAD, United Nations in Geneva, november 2003. See Foncerrada (2003).

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Introducción

Given the resources required in development, the need to achieve minimum standards of living, the urgency to alleviate poverty and the importance of creating employment, infrastructure and fostering growth, governments may, at times, run up expenses that exceed their income. At such times the need to cover their excess expenditure is often solved by borrowing in the financial markets. That is the moment when public debt is created.

To create debt continuously and maintain it through time, is to have a sustainable debt, and is the ultimate goal of a public debt policy. A sustainable debt is the product of several market development actions, debt policy and debt management factors. Fiscal sustainability is at the end, the long term challenge.

Recent literature covers several different aspects related directly and indirectly to the subject. In the following pages, this literature is reviewed, and the key elements to understanding and achieving debt sustainability are discussed. Within this framework, two important aspects are highlighted: domestic market development and financial risk management.

The first section contains a general introduction to public debt; the traditional concept of sustainability is discussed, and a different approach and more general concept of debt sustainability is proposed. The second section discusses the importance anf"the strategy of developing a domestic government securities market, including the use of market makers and the role of the Central Bank. The third section covers the importance of financial risks associated with debt. The fourth, and last section, reviews the Mexican crises of 1982 and 1994-95. The two crises are briefly discussed in order to underline the costs of overlooking fiscal sustainability and financial risks.

1. On debt sustainability

1.1 Debt

The creation of debt is a normal and usual result of economic activity. The different agents in an economy, households, firms and government, take decisions to spend, to consume and to invest. Whenever the income of one of the agents is greater than its consumption they have a surplus. And exactly the opposite, in a similar way, when some of the agents decide to consume and/or invest in excess of their income, they have to complement their income with borrowed financial resources. This shortfall or deficit has to be covered or financed, and it is then, at that moment, that debt is created.

The agents with excess income or surplus lend their financial resources to the agents with shortfalls. They do it through the financial system: through banks and the capital market. In the banks, the agents with excess resources create deposits that are then borrowed by the deficient agents. In the capital market, the agents with surpluses acquire, through brokers, debt instruments placed by the deficient agents.

So debt, in this regard, permits the different agents to accomplish their decisions on consumption and investment, and thus production and growth are fostered. Debtors and creditors achieve a common goal: a stable path of growth.

When a Government has bigger expenses than its income, it produces a deficit that has to be financed. The financing of the deficit is done through the borrowing of financial resources from the private sector and/or from the foreign sector.

For a government, as well as for any other agent in the economy, the possibility of borrowing money requires that the lenders have the confidence that the loan will be repaid and the interests honored.

In both cases, foreign or domestic borrowing, the assurance of the solvency and the honesty of the debtor, in terms of its will to pay, are fundamental.

The process of building confidence in potential creditors and of being effectively able to borrow and pay is to maintain a sustainable debt. Maintaining a sustainable debt is a process that requires attentive actions: a continuous strategy to develop the market, a lucid financial risk management and other aspects, that will be discussed.

1.2 Public domestic debt

A government, in particular, issues debt for two reasons. Because government securities are used for monetary purposes,[1] or because the government runs a deficit. Public debt issuance, *as a monetary policy instrument*, is used to reduce or control monetary expansion. It is a powerful instrument especially when important flows of foreign currency come into the economy.

This is a typical situation of a country with inflows of foreign currency derived from increases in the prices of a commodity that is exported, i.e. an increase in the price of oil in an oil exporting country, or an increase in the inflow of foreign currency derived from increases of prices of other commodities in the case of other countries. The process is as follows: the Central Bank issues domestic currency when receiving and exchanging the foreign currency brought by the exporters; thus,

[1] Modern Central Banks have developed their own securities for monetary policy purposes.

at times, in order to avoid an additional demand pressure in the domestic markets and a probable consecutive increase in prices, it becomes important to "recover" and sterilize part, or all, of that monetary expansion. And it is precisely through the issuance of government securities, also called government "paper" or public debt, that the resources or excess money in the hands of the agents is retired from circulation. Once those resources are "recovered", through the placement of public debt, the excess currency is reduced and cannot put any pressure in the domestic markets: it is sterilized.

Public debt issuance, *as a financial instrument*, is necessary when a deficit takes place; when government expenses exceed income. Then, the deficit can be financed through foreign financing and/or domestic financing. Domestic financing complements the foreign financing. Foreign financing may not always be available. And even if foreign financing is available, it might not be enough to cover the fiscal deficit or it might be used to limit it, since external debt is exposed to other financial risks. The most reliable and therefore most used source of financing, when the market has been developed, is the domestic market.

Each source of financing, foreign financing or domestic financing, has advantages and disadvantages, for a discussion on these issues see Christensen (2004), and also Beaugrand, Loko, and Mlachila (2002). The right selection of the proportion of foreign and domestic debt is part of the process of achieving a sustainable debt.

1.3 The concept of debt sustainability in the recent literature

The concept of sustainability has been discussed for at least two decades. Two general approaches have been followed, the first one considers that the interest rate at which a government borrows cannot be greater than the rate of growth of the economy, so that the ratio of debt to GDP does not rise, and an unsustainable debt does not take place. The other approach considers that if there is a present value borrowing constraint, which could limit the quantities to borrow, then that would be the main criteria to achieve sustainability. Gupta (1992) in a fine work, analyzes these two approaches for Asian countries. In both approaches, he underlines and shows the importance of two key issues: the selection of an appropriate interest rate and the treatment of taxes. A good discussion on these issues and the positions of different authors are presented in his book (Gupta, 1992).[2]

[2] On this, see Sargent and Wallace (1981), Darby (1984), Barro (1974), Tobin (1982), and Barth and Russek,(1986).

In recent years, mainly after the introduction of the Indebted Poor Country initiative (HIPC), and more recently, with the definition of the Millennium Development Goals (MDG) IMF (2003c), the concept has been discussed and used intensively by a number of authors and particularly by the Staffs of the International Monetary Fund (IMF) and the World Bank (WB).

It has evolved, from the definition based on present values of a defined borrowing constraint following the proposal of Hamilton and Flavin (1986), to other wider conceptions. Some take into account other indicators and others define thresholds as "red lights" to asses the situation of debt in the countries, especially in low income countries.

The concept, especially in the last few years, has been defined as a group of indicators and, lately, as a set of thresholds. In most of the cases the concept is closely linked to the question of its assessment, and practically identified with indicators used to *assess* sustainability.

These indicators are usually based upon the present value of fiscal budget constraints, or primary surpluses, vis-à-vis the present value of debt interest payments: "An entity's liability position is sustainable if it satisfies the present value budget constraint without a major correction in the balance of income and expenditure, given the costs of financing it faces in the market" (IMF, 2002a). This line of thought derives from the concept proposed by Hamilton and Flavin (1986).

Solvency has also been used as a synonyme of sustainability and has been defined in the following way: "An entity is solvent if the present discounted value (PDV) of its current and future primary expenditure is no greater than the PDV of its current and future path of income, net of any initial indebtedness" (IMF, 2002a), and a simple and practical formula is offered.[3] Sustainability is then defined as a combination of liquidity and solvency.[4] An indicator that gives an idea of the future solvency, and of eventual sustainability.

[3] IMF (2002a). $$\sum_{i=o}^{\infty} \frac{E_{t+i}}{\prod_{J=i}^{\eta}(1+\Gamma_{\tau+J})} \leq \sum_{i=o}^{\infty} \frac{Y_{t+i}}{\prod_{J=i}^{\eta}(1+\Gamma_{\tau+J})} - (1+\Gamma_{i})\, D_{\tau+J}$$

Where ΣE_{t+i} represents the sum of future primary expenditures, ΣY_{t+i} the sum of the current and future path of income, D the initial stock of debt, and $\Pi (1+r_{t+j})$ the product of the rates at which expenses and incomes are discounted.

[4] Liquidity. An entity is illiquid if, regardless of whether it satisfies the solvency condition, its liquid assets and available financing are insufficient to meet or roll-over its maturing liabilities. The distinction between solvency and liquidity is sometimes blurred because illiquidity may be manifested in rising interest rates in the limiting case that no further financing is available, the marginal interest rate becomes infinite, which eventually calls into question the entity's solvency.

Another indicator discussed in the literature is the present value of interests payments compared with the present value of future primary surpluses, this is the approach used by Chalk and Hemming (2000); Dinh (2003) and IMF (2002a; 2003c; 2003e). Thus a government will have sustainable level of debt when the primary surpluses cover the debt interest payments. Other authors, like Cline (2003) would require the primary surpluses to include additional resources, besides the interest payments, to assure and allow growth.

It has also been argued that an alternative measure, and on occasions a better indicator, could be the fiscal revenues compared with the debt service (IMF, 2003d). Using the different indicators templates that have also been elaborated, where variables can be measured and compared, and their critical relations can be seen through time (IMF, 2002a).[5]

The general approach of measuring and defining debt sustainability as the result of the comparison of present values, of future income and future payments, or as a *net present value*, was improved to include additional indicators:

> Instead of proposing a one-dimensional measure of debt sustainability, (…) such assessments should be informed by a menu of indicators, including the NPV of debt and debt service, relative to exports, revenues, and GDP, and their evolution over time under realistic macroeconomic assumptions (IMF, 2003c).[6]

These same criteria has been maintained and confirmed in a recent joint paper of IMF-WB: "Debt sustainability can be assessed on the basis of indicators of the debt stock or debt service relative to various measures of repayment capacity (typically GDP, exports, or government revenues)" (IMF, 2004a).

In the same document, the limits of present value of primary surpluses are acknowledged:

> Conceptually, debt sustainability assessments should be based on a government's net worth, in present value terms, which is the difference between its debt and the present value of its future primary surpluses. However, given that such an assessment must rely on very long-term projections (theoretically covering an infinite horizon) they are less useful for practical purposes. Moreover such assessments do not identify potential liquidity

[5] A good summary of these efforts, and examples of these indicators and templates can be found in Appendix I and II IMF (2002a).

[6] See pages 3-4.

problems. The practical convention is therefore, to assess debt sustainability on the basis of the above mentioned indicators (IMF, 2004a).[7]

Also, in a further development, the need for institutional development and monitoring is also admitted as part of sustainability analysis.[8]

The latest modification to the approach considers a group of defined indicators, "thresholds", together with an assessment of policies and institutions for each country:

> Notwithstanding their limitations, empirical thresholds can help inform decisions on the financing mix and program design in LICs, (Low Income Countries) provided they are treated primarily—in line with the Boards' directions—as informative guideposts. The alternative of abandoning the threshold approach altogether would be inferior, as it would leave LICs and their (mainly official) creditors without guidance as to when debt levels may become of serious concern (IMF, 2004b).[9]

The thresholds are calculated at different percentages and classified in three categories as poor, medium and strong (IMF, 2004b).

The argument for assessing policies and institutions, using the so-called CPIA index (Country Policy and Institution Analysis),[10] is the following:

[7] IMF (2004a: 13-14) as also the following conclusion on page 32 : "In sum, debt sustainability analyses for low-income countries should consist of two elements: (i) indicative country-specific debt-burden thresholds that depend on the quality of individual country's policies and institutional environment; and (ii) an analysis and careful interpretation of actual and projected debt-burden indicators under the baseline and in the face of plausible shocks".

[8] IMF (2004a: 47). "Most importantly, governments need to be in a position to track debt-service obligations effectively to avoid costly penalties, and to make well-informed and transparent decisions about the amounts and terms of new public borrowing, consistent with the broader macroeconomic framework. This requires: (i) improving the monitoring of public and publicly-guaranteed debt on a broad definition (i.e., including debt of public enterprises, and local authorities, as well as claims on the private sector that are guaranteed by public entities) to obtain a better assessment of contingent liabilities; (ii) coordinating debt management closely with fiscal and monetary policies; (iii) providing debt-management agencies with a clear legal mandate and an effective disclosure policy; and (iv) recruiting staff to public debt-management offices that have good financial market, public policy, and technical skills, including for undertaking debt-sustainability analyses, so that they can provide the necessary support to policymakers".

[9] See page 8.

[10] "The CPIA index groups 20 indicators into 4 broad categories: economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Countries are rated on their current status in each of these performance criteria, with scores from 1 (lowest) to 6 (highest). The index is updated annually. The country specific ratings (in quintiles) for both the aggregate indicators and its main components are available at http://siteresources.worldbank.org/IDA/Resources/Quintiles2002CPIA.pdf." (IMF, 2004a).

> An assessment of policies and institutions is an integral part of the suggested threshold approach, but potentially controversial in its implementation. Empirical analysis suggests that countries with strong policies can sustain higher debt ratios. This holds for other measures of policies, but the CPIA has proven to be a particularly powerful indicator (IMF, 2004b).

Sustainability has, thus been treated as an exercise of creating indicators, thresholds, and other elements *to assess* the capacity of a country to pay. The general concern certainly gravitates around the possibility of the low-income countries to meet the Millennium Development Goals (MDG) and around the success of the Indebted Poor Country (HIPC) Initiative. IMF (2003c). Indeed, without a sustainable debt, none of these programs could have a good chance to success.

However, Net Present Value Indicators and Assessments are not enough to achieve Sustainability. Assessing payment capacity to pay with all the above mentioned indicators will not, by itself, assure the achievement of a sustainable debt.

On the one hand, there is a clear and wide concern about the uncertainties of the calculations[11] as also, on the methodological issues.[12]

All indicators based on future numbers, on projections, have a number of sources of uncertainty: unforeseen changes in interest rates, rates of growth, inflation, fiscal expenditure, etc. A key element is the selection of the interest rate to calculate the present values, and then long term estimations of interest rates play another important role.

Its probabilistic nature is broadly acknowledged. As discussed, assessments of sustainability are probabilistic, since one can normally envisage some states of the world under which a country's debt would be sustainable and others in which it would not. But the proposed framework does not supply these probabilities explicitly; rather, it traces the implications of alternative scenarios and leaves the user to determine the probabilities that should be attached (IMF, 2002a).[13]

[11] For a good review of these uncertainties see the paragraphs on pages 5 to 7 de "Assessing Sustainability" (IMF, may 2002a).

[12] The debate on methodological issues—such as the appropriate discount rate for calculating the net present value of debt (and perhaps of exports, GDP or revenues) as well as the different roles of debt stock and debt service indicators—have not been fully resolved and perhaps cannot be resolved without building on experience using the framework (IMF, 2004b: 6).

[13] See page 25.

It can be argued that even with the existence and the limits of these uncertainties the practice of calculating indicators and creating templates, is worth doing: it enables the governments and the international institutions to detail the figures and arrive at the relevance of their assumptions, and therefore offers a tool to deal with probable future flows and probable future solvency. A systematic use of these indicators should, no doubt, be also part of the routine of a debt management office.

But it must be underlined that as good and useful as indicators can be, they are in the end only that: indicators. And as all indicators for the future, they are probabilistic and greatly depend on projections, and projections depend on assumptions. So that is what they are, indicators of probable solvency, of possible liquidity and of probable vulnerability; indicators, thresholds, if you want, of one or two of the several aspects, but only one or two of the aspects, to assess *payment capacity*. The ratios and thresholds can be useful to asses the capacity of a country to pay its debt and to warn creditors and institutions of a possible default, but they do not build or achieve sustainability. Sustainability results from policies, from specific public policies.

What then is debt sustainability? How can it be achieved? Sustainability cannot just be conceived of as the *use* of ratios of indicators of future flows. And certainly it is not just a synonym of solvency. Sustainability is more than that. A wider approach is required.

Sustainability is a Process. So let us state the following: sustainability should be conceived of as a *process*, a series of actions and functions geared to sustain, to maintain the debt flows, the borrowing and the debt service. So sustainability is not just the result of some indicators to assess payment capacity. It is a *process*. And as a *process*, it is characterized by several different aspects.

The following, are five minimum aspects that are critical to this *process*.

a) Legal famework and istitutional sructure
   The design, achievement and continuous improving of a good Legal Framework, and of an efficient Institutional Structure of all functions regarding debt management. This is a fundamental condition.
b) Coordination and communication
   The establishment of an institutional practice of continuous coordination and communication among the debt management unit, the fiscal area, and the monetary authorities is as decisive as having the legal framework and the institutional structure. One cannot work with only one of the parts.
c) Market development
   Sustaining debt is also, and probably mostly, developing and sustaining a market.

The will and ability to develop domestic markets is essential to the *process*. The identification and application of all available methods to develop the market, *i.e.* the use of market makers may be essential. And a continuous presence and continuous analysis to monitor the market´s behavior are key elements to achieving a sustainable debt.

d) Staff
The importance of the qualification of the staff cannot be overstated. The careful selection and continuous training of the staff in charge is the only way to assure a successful maintenance of markets and a solid debt management. This aspect is probably the most critical. The team should be able to match the borrowing requirements with the best risk-weighted financing. They should certainly be able to thoroughly understand the effects of different financing options on the macro variables. It is fundamental to have an attentive, thoughtful and proficient team.

e) Tools
It is indispensable for the staff to use the best tools available. The best planning and controls, can only be achieved by using adequate technical tools and an adequate software. Risk management cannot be successful without good technical tools.

The classic Financial Programming can, if systematically and thoroughly used, do a great job. That has been the experience. It will always be a powerful tool. For a good description see Caiola (1995). Asset-liability management and the recently introduced balance sheet approach can be used as interesting and useful complements.

Sensitivity analysis, done systematically, will certainly be a definitive and important aid. A good template with a good family of indicators, including those mentioned above, is essential to assess risks and to put together early warning models or systems.

Sustainability is a live process consisting of a series of actions and functions that take place everyday in a well established legal framework and a well established, and functional, institutional structure. Since sustainability is a process integrated by these five aspects, the next question is: how do we assess it?

How do we Assess Debt Sustainability? The answer is simple; if we cannot just compare present values of debt service and future fiscal surpluses, we would only be assessing one of the several aspects of the process. Instead, in order to have a fine and reliable assessment of the real sustainability of debt, we need to assess each one of the mentioned aspects in each country.

For each of these aspects, it is necessary to establish a few well-defined concepts and variables, which can help to determine and assess, with the greatest possible accuracy, the process of policy decision making, as well as its steps and its performance. Thus, the monitoring of the markets, their development, and the effectiveness of the actions can really be evaluated and financial risks reduced or eliminated. The supervision and qualification of the training and of the members of the team, and their use of technical tools and ad-hoc software, complement the assessment.

Sustainability defined as a continuous process, can then be assessed and eventually achieved. Solvency, consequently, is the success of carefully maintaining the debt. It is the result of sustainability, the result of this *process*.

Fiscal policy and debt management have, in the end, critical impacts on real wages and employment. Fiscal sustainability and debt sustainability are imperative. These two dimensions are key elements for the achievement of the Millennium Development Goals and the success of the Indebted Poor Country Initiative.

So, keeping a good process and carefully assessing it are the critical steps. The achievement of sustainability requires hard work in all and every one of these aspects. Assessment allows rectification and improvement of the *process*.

2. Fostering a market for government securities

One of the most important aspects of achieving sustainability is the development, as mentioned, of a market for government securities. There are several aspects that are critical to the development of a securities market in general. The procedure of developing a government securities market is not different and it is also an important step towards developing a capital market in a country. Among the different actions that constitute this process, we will mention some of the most important ones, and we will make special emphasis of those related to the development and operation of the market.

2.1 Sound macroeconomic environment

A stable and sound economy is fundamental to develop a government securities market. It is without doubt a decisive element. Confidence of potential investors is critical and an important part of the confidence can only be built when the main macroeconomic variables are stable and can be forecasted within reasonable confidence.

Fiscal policy should be sustainable: a governmental expenditure policy should be well planned and linked to the fiscal income and taxes in the medium and long run. Then the deficits, if any, can take place when they are necessary to achieve specific goals, but always with fiscal sustainability as a permanent target in the projected paths. Monetary policies should be consistent with a moderate and reasonable expansion of the monetary base and according to the results of the balance of payments.

The main prices of the economy; exchange rate, interest rate and the general vector of prices should be left to accommodate market forces, without restrictions and without preconceived patterns. So that they can reflect, by freely adjusting, the decisions of the different agents in the economy, and thus become real parameters for allocating the different resources.

2.2 Market regulation

A government securities market can only be developed with a solid legal base: clear rules and regulation of the issuance, trading and redemption of securities. Rules, and regulation of these three fundamental steps need, in the first place, a legal framework.

This framework will allow the authorities to create, regulate and enforce the best practices in the market's operation, as also the conduct and roles of the different participant financial institutions. Transparency, accountability and best practices, including reporting, accounting, auditing and disclosure, can only be obtained through a sound legal and well defined regulatory framework.

A sound design and an attentive development of a legal framework will allow further developments in the capital market and an important growth of private securities issuance. The regulations should underline the transparency of results in auctions, and the reporting by institutions.

2.3 Market development

One of the important aspects in the development of a capital market is the existence of a wide number of instruments and maturities. Another one is the liquidity of the market. Several elements may improve the functioning and the liquidity of a market.

A major goal in the development of the market is to achieve an existence of securities with *different maturities*. The more options to invest, in terms of maturity and rates, the bigger the "menu" to satisfy the different desired yields, the periods of investment or maturity, and the liquidity those investors require.

To achieve a smooth and sustained growth, the participants in a financial system and in particular in a capital market, need the greatest possible information as to when and what kind of securities will be available. In that sense, the public knowledge of the planned placements and the funding needs of a government are very important. *A calendar of the placements,* for the different maturities is an excellent aid to support the plans and expectations of the investors. Also, a calendar is an instrument for forming expectations regarding the changes in the yield curve and interest rate trends in the economy. The programmed placements and the specific order of the placements, for different maturities, underline and define new trends and produce new yield curves. Thus, a good framework to make financial plans for all agents in the economy is established.

The liquidity for firms, institutional investors and the public in general is of the utmost importance: investors do need the possibility of converting their investment in liquid assets. Otherwise, the possibility to invest their financial surpluses, which are temporary in many cases, would be restricted to the existence of an instrument that matches precisely the required period of their investment. This would certainly represent a very rigid limitation to investment and to the market's development. It is then critical to have a well developed *secondary market,* and its efficiency is critical to achieve a good degree of liquidity in the market. For its part, the ??Central Bank's operations are important to manage market liquidity. The introduction of market makers is as important aid to develop and create liquidity in the markets.

2.4 Introduction of market makers

Market makers may be introduced to the market so as to increase liquidity, reduce transaction costs, and facilitate end-buyers' purchases of government securities.

Based on their activity in the primary and secondary markets, brokerage firms and financial institutions can be selected as market markers.

There should be a continuous evaluation of the market development vis-à-vis the activity of the market makers, to guarantee that they continue, at all times, to play an important role in the development of the domestic market.

With the introduction of market makers, an increase in secondary market liquidity should occur. Also, as a result, bid-offer spreads for all fixed-rate securities should tighten. Market makers should in general facilitate the distribution of government securities all the way down to end-buyers and smaller clients.

In line with the objective of strengthening government securities markets, the government should also do the following:

a) Have continuous contact with the financial community: There should be periodical –monthly– meetings with market makers to discuss recent developments in the local markets and the overall macroeconomic environment. Periodic meetings or conference calls can be held with other institutional investors to discuss relevant issues and get feedback on the current issuing program of government securities.
b) Introduction and continuous improvement in the "repo" market and securities lending regulation: Substantial changes can be discussed and introduced, regarding the way the "repo" market operates with the financial community. It is useful to consult other works where different steps and conditions to develop a government securities market are presented and discussed.[14]

3. On financial risks

One of the critical elements of achieving a sustainable debt is the attentive management of financial risks. In part four, the Mexican experiences of 1982, and 1994-95 are perfect examples of the overlooking of this critical aspect.

3.1 A brief look at some financial risks

Financial risks are always present when debt is issued. They appear associated with the different kinds of debt that are issued. A brief review of some risks is presented, including an explanation on how and why they appear, and the possible consequences. Four of them are discussed here: interest rate risk, refinancing risk, currency risk, exchange rate risk. Interest rate risk is inherent to existing floating-rate debt, and is as simple as having higher financial costs when an increase in interest rates takes place. This is obviously valid for both, a firm or a government.

Refinancing risk arises from the possibility of an adverse environment in the capital market, where the government could face difficulties when trying to roll over its maturing debt in favorable conditions. Currency risk is the risk that could arise from having, or contracting debt in a foreign currency different from the one in which the sources of income or financing usually come. So that unexpected changes in the exchange rate between those two, could imply high financial costs.

Exchange rate risk appears when the debt is denominated in a currency different from the domestic currency. Devaluation could increase the debt service

[14] See for instance Handbook on Development of Government Bond Markets, World Bank in cooperation with the International Monetary Fund; IMF-WB (2001b: 32) and IMF (2003b).

in terms of domestic currency. In the case of the Government, it would be debt denominated in a currency different to the one of the country, when obviously its income in general, taxes and other, are denominated in the domestic currency.

How can risks be avoided or reduced?

In terms of debt management, the *interest rate risk* could be reduced by the gradual substitution of floating-rate debt, by placing fixed-rate instruments. The *refinancing risk* could be reduced by achieving a prudent maturity profile, and by avoiding important amounts of debt to mature in the same year.

The *currency risk* can be avoided by not contracting debt in a currency different to the one in which inflows usually take place. And last, the obvious solution to the *exchange rate risk* is to avoid having debt denominated in a foreign currency, at least in excess of the predictable income in that currency. An important policy would be substituting, as far as is possible, foreign debt for domestic debt. This action implies, on the other hand, the development of a domestic debt market.

4. The mexican crises. A financial risk approach

4.1 Financial risks, poor market development and economic crises

The two mexican crises of 1982, and 1994-95, are interesting examples of a combination of wrong economic policy decisions and mismanagement of financial risks. The effect was to suffer all implications of an unsustainable debt. In both crises though, there were external and/or political elements that had and additional impact. Nevertheless, an attentive and cautious policy and a lucid risk management could have made an important difference in the recent history of Mexico. And the debt would have been sustainable.

4.2 The 1982 crisis

The first experience discussed is the period before August 1982. On the 20th of august Mexico declared a suspension of payments, with practically no international reserves left. Enormous fiscal deficits were taking place in the previous years. Every year, since 1978, practically all domestic financial resources were used by the different governments, and the domestic financial resources generated in the economy were canalized in different ways to satisfy the increasing financial needs of the public sector.

A very young money market was developing: the so-called CETES, or Certificates of the Treasury, which began to be placed in 1978, with maturities of

28, and 90 days, but an artificial demand was created, and all public entities were forced to buy CETES with their temporary treasury surpluses, and to maintain up to 90 % of their liquidity in this instrument.

The measure worked very well and eventually a stable demand was created. This measure created the time for the private sector to get familiarized with the new security and it started to invest in it.

Even at the beginning, this instrument helped to finance part of the public sector's financing requirements, and was an aid to "use" and recycle the public sector entities liquidity, which helped to reduce the pressure for further funds in the market.

The amounts used by the public sector in those years were so big, that just mentioning the reserve requirement on the banks -which were then lent by the Central Bank to the government- gives an idea of the "crowding out" that was taking place: almost 90% of all bank deposits, were transferred to the public sector. Important amounts of primary credit complemented the amounts to make up the financial gap of the public sector. But the fiscal deficits were so high, that even this domestic financing was not enough: the foreign financing increased by around 60 billion dollars in less than 5 years. The discovery of new oil field and the huge investments required by the industry were the main reasons to explain, -and justify- this huge use of foreign resources.

There is one more element to understand the situation: the exchange rate was fixed, as if keeping it at a certain value would proof the solidity of the economy, but in fact it was conceived in those days, by the authorities, more as a symbol of national strength, than as an instrument of monetary policy.

In 1982, international interest rates increased to very high levels, and the price of oil went down to almost one third of the price in the previous years. It was a perfect disaster for an economy whose balance of payments was relying heavily on those two variables.

The moment the price of oil started to fall, and in view of the very high indebtedness of the country, international banks started -too late-, to show reluctance to continue lending. So the possibilities of refinancing dried up very fast. There was no re-financing available for the amounts due at that time, nor was there any fresh money.

This situation accompanied by big current account deficits and a fixed exchange rate, provoked a vast reduction of international reserves, and brought about immediately an important devaluation. In a "small and opened economy", which was the case of Mexico, the devaluation brought high inflation. Also, total liabilities in the government balance, the public foreign and domestic debt, in

domestic currency, in *pesos*, increased to extraordinary amounts overnight, due to the devaluation and to a multiple exchange rate introduced at the moment of the devaluation.

Several aspects should be underlined:

a) The domestic government securities market, which was barely developing, was not sufficient to satisfy a significant part of the financing, and like many markets which are just starting to develop, it was still very primitive. Only four years old, no fixed rate issues had taken place. On the other hand, in those days, a fixed rate was difficult to conceive of because of the increasing inflation, and the expectations of the agents.
b) Very little attention, if any, was paid to *refinancing risk* and to *interest rate risk*. In the case of the foreign debt, both risks turned critical; and in the case of domestic debt, the interest rate risk turned out to be inevitable.
c) Lastly, no attention was paid to the importance of fiscal sustainability: there was a misconceived Keynesian reasoning that eventually growth would "pay" for the deficits without taking into account the financial aspects and the financial world.

No attention was paid to financial risks and, in general, the financial aspects were ignored.

The consequences of a poor debt management, of a fixed exchange rate, and of deliberately and indulgently ignoring the financial implications of no fiscal discipline, were almost 10 years of zero growth, high unemployment and a dramatic fall in real wages.

4.3 The 1994-1995 crisis

The second experience is the crisis that took place after the devaluation of december 1994. The policy and actions of the previous years and months explain the crisis,

After the 1980s, Mexico was finally achieving some growth. Also, in the early nineties, after the Brady Plan, took effect place in 1990, the external debt was on the way to being solved.

The exchange rate though, was kept sliding at a relative low rate, as an instrument to keep inflation down. It was being used as an anchor for domestic prices. Also, an important opening of the economy was taking place. Slowly but surely, and I might add, obviously, this policy had the usual effect on the balance of payments: in 1992 and 1993 there were very high current account deficits, and reserves started, of course, to fall. Additionally, in those years, the new bankers

who owned the recently privatized banks, in the absence of a good legal framework, with poor supervision from the authorities, and anxious to recover their investment after the high prices they paid for the banks, placed as much credit as possible. The result was a very important credit expansion. This, together with the over-valuated exchange rate added to the already increasing deficits in the current account and brought reserves even lower. Then, as an emergency measure, the authorities took a financial decision that turned into another mistake and caused into all possible risks.

To try to compensate the demand for foreign currency, instead of devaluating, and of course modifying the inflation target -which was the trade-off-, the Mexican authorities decided to use a 90 day instrument denominated in pesos but indexed to American dollars: the famous Tesobonos (treasury bonds). An attractive rate was offered and it was heavily placed. Part of the investment came from important flows of foreign currency, which were strongly attracted by the rate and the 'hedging' built-in. It worked: the equivalent of 30 billion dollars in a little more than one year was received. Obviously, this "domestic" instrument turned, in the end, into an "external" liability, which increased the claims on the international reserves, precisely when they were already thinning.

The story had the usual ending: with falling reserves during 1994 and an announcement to keep the same exchange rate policy in 1995 –which turned into an obvious expectation and forecast, for 1995, of an almost 30 billion dollar deficit in the current account– this provoked not just a very reluctant attitude towards refinancing the Tesobonos (dollars in other words), but also initiated a speculative attack against the already reduced reserves.

The usual effects, then once appeared again: devaluation, inflation, increase of domestic interest rates to match inflation, and certainly, immediately, a massive default on domestic bank credits. This provoked a generalized technical bankruptcy in practically the whole banking system. The government, then came with a rescue package for the banks, to avoid a banking system failure at that moment. This implied, again, a fantastic increase in the domestic debt: around 10% of GDP, almost half of the outstanding domestic debt. Again, the consequence of not having a developed domestic market was evident.

4.4 What was overlooked?

A refinancing risk –that can always be triggered by expectations–, was totally ignored. The "domestic" debt turned in to foreign debt, a typical currency risk was then created, and afterwards an exchange rate risk took place. This was probably

also a product of a moral hazard: there was a change of President in 1994, and the administration's last day in power was november 30th. Whatever would happen in december wouldn't be the fault of the administration that was leaving. In fact, the exiting group called it the "December error", a phrase brilliantly coined.

The cost of the devaluation and the bank rescue amounted to around 30% of the GDP. After the crisis, and in order to recapitalize the banks, these were sold to foreign banks to recapitalize them and as of today over 97% of the banking system is foreign.

4.5 What are the lessons to be learn?

From these experiences some lessons were drawn, and several actions were taken: monetary and fiscal policy had to be much more coordinated; also, it was learnt that the Central Bank should have total autonomy. This was decided and institutionalized later, and the Central Bank has today the specific mandate to take care of inflation. The legal framework for the banks was strengthened, and supervision moved towards consistent and strict policies for credit control. Debt management was better defined and the institutional structure was improved.

Several important goals were set regarding debt management in order to reduce the mentioned risks: to reduce the participation of foreign debt vis-à-vis the total debt; to deepen and develop further the domestic debt market; to improve the amortization profile; to increase the ratio of fixed rate debt vis-à-vis the floating rate debt; to increase the average life of outstanding debt.

Another important lesson was the importance of selecting a well trained team to manage the debt. And training it so as to be able to use state of the art policies in financial management. The team should clearly understand the links between monetary and fiscal policy and also the importance of developing and taking care of the markets.

Also, an important step towards developing the domestic market, was the introduction of "market makers", who have been working towards: reducing transaction costs; increasing liquidity; facilitating the placing of securities; it was also learnt that an analysis of vulnerability, with sensitivity variables, to be used in stress tests and early warning models are absolutely critical.

Conclusions

The development of a capital market is a necessary step for growth and development. It is an essential mechanism for the different agents in an economy to allocate and use the financial resources available.

The markets for financial funds, capital and money markets complement the banking system and help to deepen the process of financial development; they represent a major factor in fostering growth.

For any government, the development of a money market represents the important possibility of placing domestic debt. The number of financing alternatives is increased and the government can then decide from among the best possibilities, not just between domestic and foreign financing, but also to elect from a number of options with different rates and maturities. One of the important implications is that the government will depend less on international markets and, therefore, will have greater autonomy and sovereignty. Besides allowing the possibility of the domestic financing, these securities can also be used by the monetary authorities to control and stabilize the monetary aggregates.

The development of a domestic debt market is an essential part of financial policy and it should have a high priority.

The challenge is then, for the government and monetary authorities, to develop and maintain a domestic debt market and a capital market in general. The main concept in this challenge is *debt sustainability*.

Debt sustainability is a dynamic process, a live process that has to be carefully assessed and improved on a daily basis. Two particular aspects of this process are of special importance: market development mechanisms; and risk management.

The Mexican experience of the recent past offers both faces: on the one side, the dangers and costs of overlooking risks and postponing a thorough development of the domestic market, and on the other side, the extraordinary results from following, recently, the right policies to achieve debt sustainability (IMF, 2003b).

Market development and debt sustainability are crucial issues as far as having a sustainable development, and should be implemented following the best practices and using the best instruments.

In the end, the standards of living of any people can be improved or badly deteriorated by economic policy decisions. Debt management, debt sustainability and risk management are to be undertaken with great professionalism and responsibility. The mexican experiences of the 1982 and the 1994-95 crises are there to remind us of the brutal effects of deliberately or indulgently ignoring debt and fiscal sustainability.

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