# PUBLIC DEBT MANAGEMENT

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## Contents



## Summary

This article explains why there is public debt and the importance of an effective public debt management including aspects of economic theory and practice. It gives a brief historical perspective of debt crises—from the XIX century to beginning of the XXI century—that originate the effective debt management functions. The article follows the definition of public debt given by the international Task Force on Financial Statistics (TFFS); however, it also explains other alternative definitions. The debt algebra is briefly explained as well as some debt instruments and their valuation giving numerical examples and the corresponding formulae for the calculations. The legal and institutional setup for an effective debt management is described for democratic countries, where the parliament has a paramount role in approving the level of public indebtedness of a country, as well as the coordination among public debt management and fiscal and monetary policies.

Debt sustainability regarding the external gap, i.e. balance of payments, and the fiscal gap, i.e. the central budget deficit is also explained and dealt with giving a numerical example for the balance of payments. Indebtedness sources for the government that are not linked to the budget deficit are explained as well, in particular contingent liabilities. The article devotes a special chapter to debt of emerging markets and developing countries. There is also a brief description of the existent debt rescheduling clubs, i.e. the Paris Club and the London Club(s), as well as the proposal for a Sovereign Debt Rescheduling Mechanism that has not found an international consensus in order to be implemented; however, this is an important initiative that is worthwhile to mention.

# 1. The Importance of Public Debt Management

## 1.1 Why Public Debt?

### 1.1.1 Economic Theory and Practice

Public borrowing is an alternative to taxes, and it allows for sudden increases of budgetary expenditure without having an immediate effect on the taxation rate: an increase of public debt in one monetary unit today implies an increase in present value in one monetary unit of future taxes. In fact, the previous sentence assumes that there is Ricardian equivalence (Ricardian equivalence states that when a government tries to stimulate demand by increasing debt-financed government spending, the global demand remains unchanged; because the public will save in order to pay for future tax), in which whether the government finances spending are financed through taxes or borrowing is irrelevant, as long as there is certainty about future levels of income, public spending and rates of return, with perfect capital markets and certain future horizons for households.

Under these conditions, the present value of taxes is fixed by the path of government spending. In this case, public borrowing can change the timing of taxes but not the present value. Therefore, the issue of an extra monetary unit of debt to cut current taxes by one monetary unit implies an increase by one monetary unit in the present value of future taxes. This result applies as long as the government does not pursue borrowing schemes that may be a *"fuite en avant"* (*fuite en avant is a French expression that means something one does when one is in a difficult situation, and one hopes to salvage it by doing more of the same or worse, in our case borrowing more to finance expenditures and debt service. A typical example of fuite en avant is the implementation of a Ponzi scheme*), e.g. borrowing for paying government expenditures and to repay debt, leading to a situation in which the public debt grows faster than the economy.

The debt financed tax cut does not affect consumer demand, because the extra government bonds issued to finance the tax cut are bought and held by households without any changes in market interest rates. The additional monetary unit of public dissaving is offset by an added monetary unit of private saving; in consequence national savings do not change. Dissaving is spending an amount of money greater than available income. Dissaving is considered the opposite of saving, and can include tapping into money already in a savings account or accumulated elsewhere. Dissaving may also take place by borrowing against future income by taking out a loan or using credit cards. Dissaving can continue to the point where income, savings and available credit are all exhausted.

Households are connected to future generations by a network of active wealth transfers based on family linkages or altruism, a tax cut financed by borrowing would not shift tax burdens from today's generations to later ones. Normally, parents provide voluntary transfers to children, either through bequests and/or resource transfers during their life. Hence, there is no effect on parents' wealth and there are no changes in consumer demand. Under these circumstances of Ricardian equivalence, public debt management is irrelevant, as well as its amount and structure. This result remains valid with the

existence of external debt. The present value of taxes paid by domestic residents is invariant with a current budget deficit even if some debt is held by non-residents. However, the existence of external debt may influence the government to default on its external outstanding obligations. This effect could emerge if governments attach less cost to expropriating non-residents, rather than domestic residents.

Notwithstanding, in real life, Ricardian equivalence hardly holds. The most important reason for the failure is the distortionary effect of real-world taxes. Distortionary taxes are taxes that affect the prices of items in a market. For example a tax on beef might oblige people to switch to pork. A tariff is an example of distortionary tax because imported products cost more, so consumers have an incentive to purchase domestic products. In our case, income taxes influence choices of how much and when to work. Similarly, taxes on wealth, expenditures and production—for instance, value-added taxes (VATs)—affect decisions on how much and when to spend and produce. In these cases, economic choices depend not only on the prospective present value of taxes but also on their timing.

As Ricardian equivalence does not hold, the government has to arrange its debt issues so that the required taxes—on income, production and consumption—are smoothed over time. This pattern avoids distortions that arise from irregular patterns of tax rates. In other words, the government does not wish to induce variations in work, production and consumption that would lead to irregular patterns of tax rates. The tax-smoothing approach generates two implications:

- First, the government should run budget deficits at times of temporarily high public outlays. The classic situation is wartime or natural disasters that require exceptional spending, where the high levels of spending during wars or reconstruction after natural catastrophes are paid mostly by borrowing, rather than current taxation. The policy of paying for added public spending with debt issue works only if the extra spending is temporary. If the expansion of the public sector is permanent, then deficit finance means that taxes must be raised even more in the future, partly to pay for the added government expenditure and partly to finance the extra debt. Thus, the proper response to a permanent expansion of the public sector is a corresponding rise in tax revenues. For instance, Keynes recommended deliberate deficit spending by governments to increase aggregate demand: public spending—putting people to work and money into investment—has a multiplier effect that will lead to full employment.
- Second, budget deficits should be high at times of temporary economic distress and low—preferably zero or in surplus—in good times. If public outlays do not fall proportionately with real income during a recession, a balanced-budget policy would require higher tax rates. This policy would therefore violate the principle that tax rates should be smoothed over time. To avoid this outcome, the government has to borrow during recessions to keep tax rates relatively stable. This policy works because future periods with renewed economic activity will provide better times to raise tax revenues and repay debt. However, the policy does not work if the depression in economic activity is permanent. In that case, if government expenditures are not cut, the proper response is higher tax revenue, not more public borrowing.

The two implications stated above are illustrated in Chart 1 for the evolution of the budget deficit and public debt in France from years 2000 to 2014.

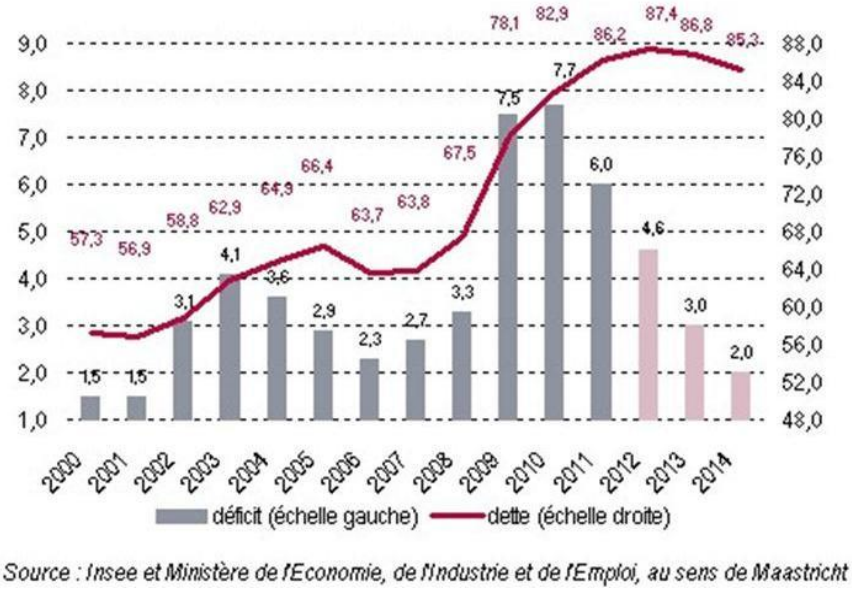


Chart 1. Budget Deficit and Public Debt in France in Percentage of GDP: 2000-2014

In this stage of the analysis, the choice between public debt and taxes is of a paramount importance. However, the selection among types of debt instruments—short- versus long-term, nominal versus indexed, domestic currency versus foreign currency—still does not matter. With perfect certainty for interest rates, price levels, exchange rates, etc., the rational pricing of each instrument on financial markets ensures that each option entails the same time path of real interest payments on the public debt. To assess the optimality of the composition of the public debt, one has to go to a further stage of the analysis in which uncertainty is introduced.

The relevant uncertainties for the government are those that have a direct effect on its budget: expenditure and real GDP, which affect the government's tax base; as well as rates of interest on public borrowing, which affect the public debt service. The government's optimal tax problem is to minimize expected deadweight losses financing the budget, subject to these uncertainties. Deadweight loss is a welfare loss, and to estimate welfare losses it has to be considered the total surplus before and after the tax. Deadweight loss, also known as "excess burden", is a pure loss to society. It represents lost value to consumers and producers due to the reduction in the sales of the good due to its price increase after taxes, but not captured by government revenue. In other words, the loss to consumers and producers from the tax is larger than the size of the tax revenue.

Making abstraction of the currency in which the government borrows, the uncertainties motivate the government to issue securities whose payoffs are countercyclical to the relevant risks. For instance, the government would apply a strategy issuing bonds which coupon rate is low when government expenditure is high and high when expenditure is low. However, that kind of contingent bonds on government expenditure may create

moral-hazard problems; e.g. the government is motivated, *ex post*, to overspend. For this reason, the government bonds for which the pay-outs are explicitly contingent on the levels of public expenditure are not utilized.

The argument developed in the previous paragraph can be further extended to nominal bonds, i.e. bonds that are not linked to inflation. For these securities, the real pay-outs decline when inflation rise; hence, fluctuations in the inflation rate cause variations in real financing requirements and, hence, in future taxes. Since the government is trying to smooth taxes, this property makes nominal bonds less attractive than indexed bonds if there is randomness in inflation.

To the extent that the inflation rate and government expenditure are positively correlated, the existence of nominal debt motivates the government to overspend in the same way as the government expenditure contingent bonds. Thus, nominal bonds have the same moral-hazard problem as the government expenditure contingent real bonds and are otherwise inferior, because of the random fluctuations in inflation. If the moral-hazard problem is serious enough to make the issue of government expenditure contingent bonds unwise, then this problem would also be strong enough to make nominal bonds less attractive for the government than indexed bonds.

However, regarding inflation and its effect on government's bonds payoffs, the Central Bank has a paramount role to play, which is its specific responsibility on the implementation of monetary policy, i.e. controlling inflation and fixing the rate of interest. In modern and democratic economies, the Central Bank and the Ministry of Finance are meant to take independent policy actions. The implementation of this independent policy by the Central Bank during inflationary times would, in some extent, decrease the moral-hazard on nominal bonds, because during these inflationary times the Central Bank would raise the interest rate, and this would be reflected in the real government bonds payoffs, decreasing the moral-hazard problem pointed out above.

Regarding the GDP, the government would also be motivated to issue securities that payoff low during recessions, when the tax base is low, and well during booms. This pattern can be achieved by issuing GDP-contingent bonds. This kind of securities has seldom being issued, the explanation being that errors and delays in national-accounts measurements may complicate and occasion delays in the payments to creditors. There is, however, one historical precedent: the restructuring of the Argentinean debt in 2004-2005. In this case, the Argentinean statistical office, the "Instituto Nacional de Estadística y Censos" (INEC) is in charge of calculating the GDP rate of growth. Notwithstanding, it has not been without controversy, with investors complaining that the Argentine government manipulates the statistics (On the theory of GDP-indexed bonds see Borensztein and Mauro (2002), Griffith-Jones and Sharma (2006) and Ruban, Poon and Vonatsos (2007)).

Finally, the government would like to issue securities whose payoffs are contingent on required coupon or interest rates for future debt issues. The goal is to insulate the public budget from variations in these rates. This part of the government's objective can be accomplished by issuing indexed government bonds—linked, for example, to the consumer price index—and then choosing an appropriate maturity structure for the debt.

If indexed bonds are not desirable and the government wants to issue nominal bonds, then the solution for the optimal maturity structure of the public debt will depend on different factors. Fluctuations in inflation and, hence, nominal interest rates tend to affect the value of long-term nominal bonds more than that of short-term nominal bonds. Therefore, the government can lessen the impact of inflation on the public budget by shortening the maturity structure of the nominal debt. However, shortening the maturity has the drawback of increasing the sensitivity of the public budget to variations in real interest rates.

Note that the relevant aspect of short-term is not the maturity of the debt but, rather, the degree of sensitivity of debt payments to fluctuations in short-term market real interest rates. The desire to insulate the budget from these variations in real rates is the rationale for long-term debt. The problems of fluctuating refinancing costs can be avoided by making the maturity structure of the public debt long-term. The strategy is to structure the debt so that similar and small quantities of government bonds are rolled over in each period.

However, the hypothesis at the base of the strategy described in the previous paragraph will seldom realize. Therefore, uncertainty about future values of expected growth ratios of government expenditures and GDP implies that future refinancing or retirements of public debt must occur; and variations in the rate of interest have impact on the public budget. Notwithstanding, the use of long-term debt makes the budget less sensitive to fluctuations in interest rate.

Governments may also issue bonds denominated in foreign currency. In contrast with indexed domestic debt, foreign currency bonds introduce effects from variations in real exchange rates. If the domestic currency depreciates in real terms during bad economic times, then foreign currency obligations affect the public budget adversely just when the tax base, the GDP growth rate, tends to be low. Hence, the use of foreign currency debt makes the government's public debt management more complicated.

In spite of that, developing and emerging market countries do issue debt in foreign currencies, like the Swiss franc (CHF), the Euro (EUR), the Great Britain sterling pound (GBP), the Japanese yen (JPY) and the United States dollar (USD); the main reason would be that the world financial markets operate in these currencies (Sometimes, the unit of account of the International Monetary Fund is also used: the Special Drawing Rights (SDR). The currency codes used all along this article are the ISO 4217 currency codes). Hence, the extra premium required on domestically denominated issues—even if indexed—in order to make them attractive to foreign investors may justify the extra riskiness of the foreign currency debt (Chapter 8 will treat the foreign currency debt more in detail).

In reality, governments issue instruments—indexed and nominal, as well as in domestic and foreign currency—with different maturities that are targeted to specific government needs, making public debt management more complicated. Nevertheless, the structure and different maturities of public debt is necessary because two reasons: first, in order to smooth the tax rate as explained above, and second, in order to address different investment needs and manage risk.

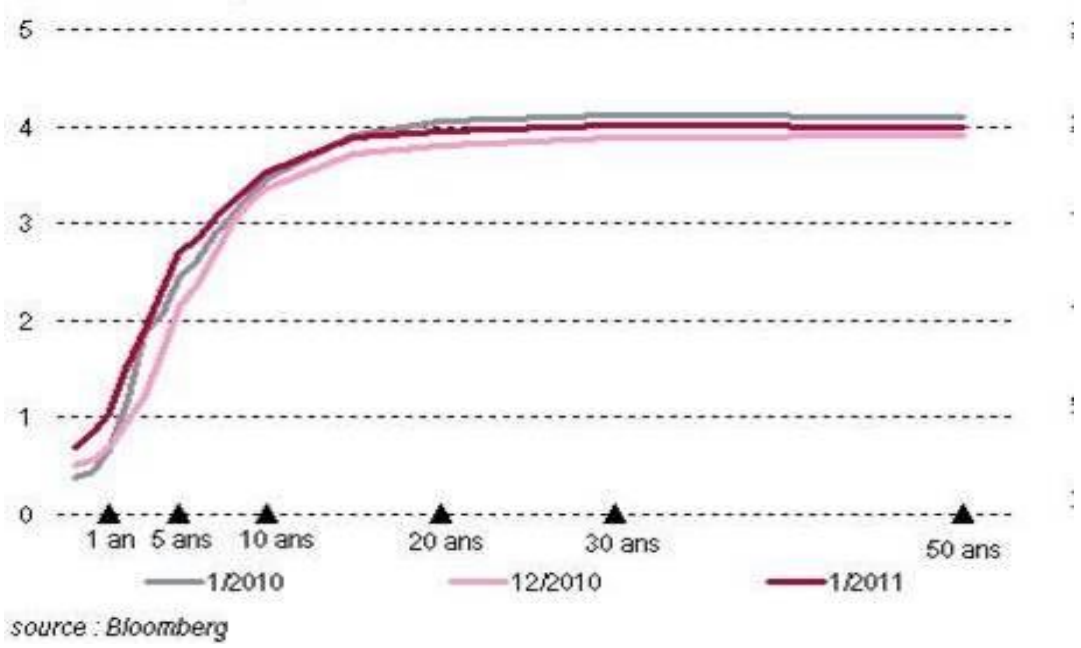


Chart 2. France: Public Debt Yield Curve 31 January 2010, 31 December 2010 and 31 January 2011

Actually, governments issue short-, medium- and long-term debt (Short-term debt has maturity of less than one year; medium-term debt is sometimes defined as having a maturity from one to three years, and sometimes from one to five years, and long-term debt is defined as with maturity longer than medium-term. In order to avoid discrepancies when dealing with medium-term debt, it has been agreed to distinguish—from the statistical point of view—only short-term, maturity less than or equal to one year, and long-term, above one year. This will be dealt with more in detail in Section 1.1.2).Short-term debt addresses needs for investors which need liquid instruments, on the one hand, and on the other hand, it is used by governments for managing treasury cash-flows, i.e. to finance the time gaps between revenues and expenditures. Medium-term debt is used to finance current expenditures in order to smooth the tax rate. Long-term debt is used to finance public investment, which full profitability will take long time to achieve.

The different maturities of government's instruments bear also different and corresponding interest rates. The rate increasing with maturity, fact that would reflect the risk incurred by the investor: the longer the maturity—and the smaller the instrument liquidity—the larger the risk. These particularities are represented on a classical chart called the rate or yield curve. The typical yield curve is represented on Chart 2 for the public debt of France at three different dates, values end of the month. The notion of yield will be introduced later, it refers to the fact that the yield of the instrument may be different to the coupon or interest rate depending on external conditions.

Chart 2 shows on abscises the maturity of debt, and the interest or yield rates on ordinates. The shape of the curve is said to be typical because, as expected, the shorter the maturity the lower the rates, and the longer the maturity the higher the rates i.e. the

curve shows a convex shape. Chart 2 shows that for short-term maturities, the rate is smaller than one per cent, and for long-term maturities, e.g. 30 to 50 years the rate is around 4 per cent.

However, in exceptional cases in which expectation on future inflation is high, it is possible to have a concave curve, i.e. the shorter the maturity the higher the rates, and the longer the maturity the lower the rates. In other cases, where the expectations for deflation in the short-, medium-term are high, the yield curve can show a "compressed" section for those maturities, as the case in the USA in 2011, originated by the radical decrease on interest rates after the sub-primes crisis. Chart 3 shows this situation, where all maturities below 2 years are yielding less than 1 per cent and the yield curve shows an "S" shape.

Another important fact is that investors are of different kind along the yield curve. Long-term issues are mainly bought by insurance companies and pensions funds, whereas short-term are instruments demanded by investors active in the money market. In the middle, we can have a large range of investors, including households' savings.

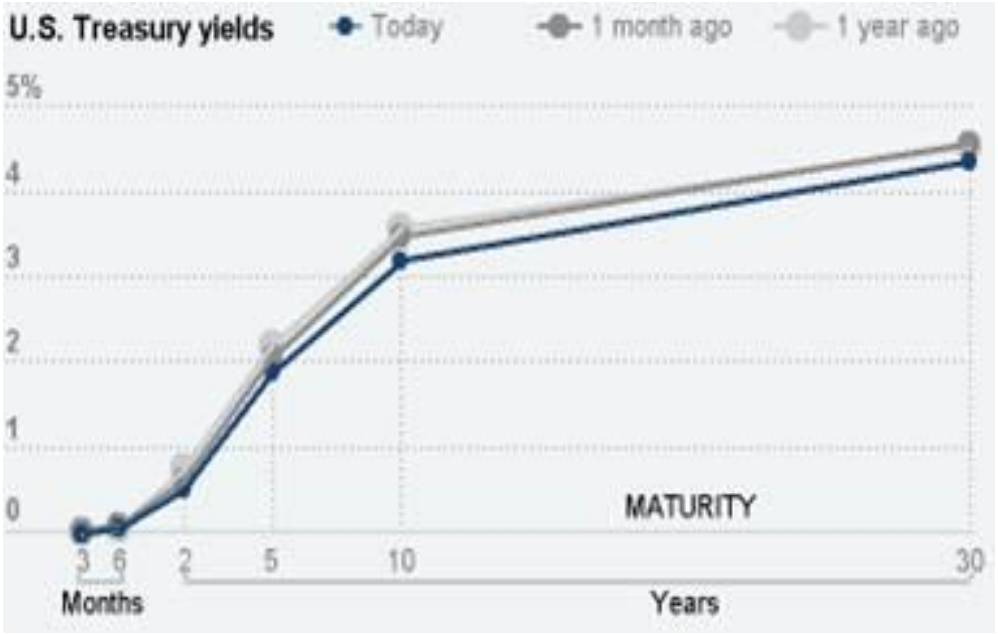


Chart 3. USA Treasury Debt Yield Curve, 18 March 2011 Source: New York Times

The yield curve has an important role as benchmark for domestic issuers—and sometimes, depending on the currency, like the USA and Germany, also for international issues in USD or EUR—because the government, in every country, is the most reliable creditor, i.e. the creditor that represents the lower credit risk (Credit risk refers to the possibility of default by the borrower. Different types of risks will be deal with more in detail in Chapter 7). Therefore, if other potential borrowers wish to issue debt in the same market—i.e. the domestic market or international markets when the issue is libelled in USD or EUR—the yield offered by these issuers has to be larger than the rate offered by the government for similar maturities. This means that a margin risk is paid by the issuer on top of the government's yield in order to compensate for a larger

credit risk. This spread or margin reflects the creditworthiness of the issuer in respect to the lower credit risk, which is the government, or in the case of international issues in major currencies, the government issuing the concerned currency. The creditworthiness of debt issuers, normally, is rated by specialised agencies, rating agencies. The major rating agencies are Fitch, Moody's and Standard & Poor's (See: http:// www.fitchratings.com /index_fitchratings.cfm, http:// www.moodys.com/, and http:// www.standardandpoors.com /home /en/ us). The better the rating of an issuer, the smaller the spread in relation to the market benchmark—the government yield curve—reflecting a smaller risk premium. Chart 4 shows the yields of 10 year maturity corporate issuers rated by Moody's as Aaa and Baa—i.e. investment grade rating—in respect to the US Treasury 10 year maturity bond. On Chart 4 the yellow curve represents the US Treasury bonds yield, and the blue and red curves the corporate issuers rated Aaa and Baa respectively. The green curve relates to the federal funds interest rate (the federal funds rate is the interest rate at which private banks lend balances—federal funds—at the Federal Reserve to other depository institutions, usually overnight. It is the interest rate banks charge each other for loans. The interest rate that the borrowing bank pays to the lending bank to borrow the funds is negotiated between the two banks, and the weighted average of this rate across all such transactions is the federal funds effective rate). It is interesting to note that Chart 4 shows that before the sub-prime crisis, the spread for Aaa corporate bonds was around 100 basis points (100 basis points equal 1 per cent), and for Baa around 200 basis points. After the sub-prime crisis, this difference, respectively, became more than 200 basis points for Aaa corporations and more than 400 basis points for Baa corporations. Hence, Chart 4 illustrates how the risk is measured using as benchmark the government's bonds.

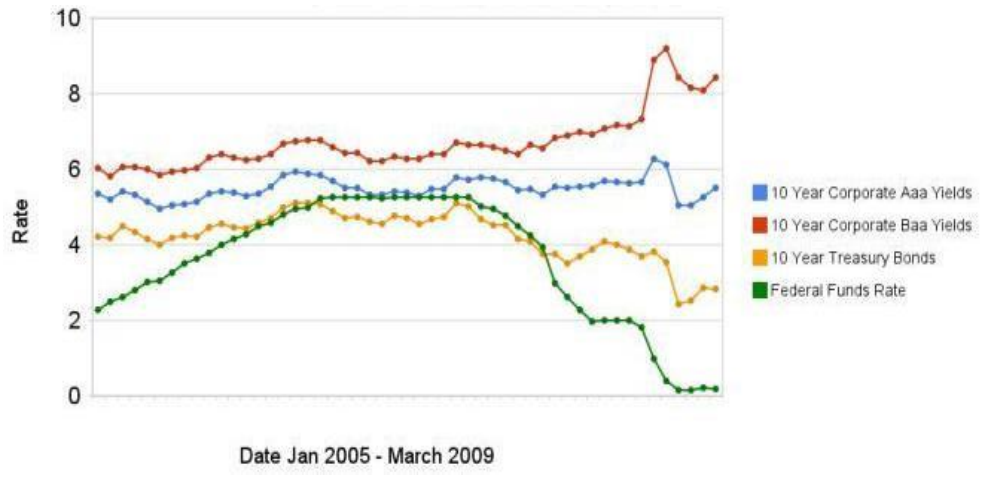


Chart 4. US Treasury Bonds 10 Year Maturity Yield Curve as Benchmark For Investment Grade Corporate Issuers January 2005-March 2009
Source: Curious Cat Investing Economics Blog, data from the Federal Reserve. http:// investing.curiouscatblog.net /2009/04/09/ continued-large-spreads-between-corporate-and-government-bond-yields /

Actually, the interest rate or yield obtained by investing in government bonds has a further benchmark role for investment decision making that may include stock shares.

Within this approach, the government bond's rate of interest is the "risk-free" investment benchmark, but this goes beyond the aim of this paper.

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**Bibliography**

Bryan, Michael F., (1997), *On the Origin and Evolution of the Word Inflation*, Federal Reserve Bank of Cleveland. [This article relates the evolution of the meaning of the term "inflation" from increase in prices to depreciation of currency].

Barro, Robert J., (1999), *Notes on Optimal Debt Management*, Harvard University, Mimeo. [This article discusses the notion of "optimal debt management" under different economic hypotheses].

Bank for International Settlements, International Monetary Fund, Organization for Co-operation and Development and the World Bank (1988), External Debt: Definition, Statistical Coverage and Methodology, OECD, Paris. [First general agreed framework for collecting statistics on external debt].

Bank for International Settlements, Commonwealth Secretariat, European Central Bank, Eurostat, International Monetary Fund, Paris Club, Organization for Co-operation and Development, United Nations Conference on Trade and Development and the World Bank (2003), External Debt Statistics: Guide for Compilers and Users, IMF, Washington. [The 2003 Guide is consistent with the Balance of Payments Manual 5 (BPM5) and the United Nations System of National Accounts 1993 (SNA 1993). Both of these documents have been reviewed and updated in the Balance of Payments Manual 6 (BMP6) in 2009 and in the United Nations System of National Accounts 2008 (SNA 2008). In order to make the Guide consistent with these two recent published documents some minor modifications will be introduced and the updated Guide version will be available in 2013].

Bank for International Settlements, Commonwealth Secretariat, European Central Bank, Eurostat, International Monetary Fund, Paris Club, Organization for Co-operation and Development, United Nations Conference on Trade and Development and the World Bank (2011), Public Sector Debt Statistics: Guide for Compilers and Users, IMF, Washington, November 2011. [This is the first publication that addresses classification and statistical reporting in a following a systemised methodology consistent with the Balance of Payments Manual 6 (BMP6-2009) and in the United Nations System of National Accounts 2008 (SNA 2008)].

Bazant, Jan, (1981) *Historia de la Deuda Exterior de México: 1823-1946*, El Colegio de México, México. [The history of debt and debt renegotiations of Mexico since its Independence from Spain until 1946].

Birdsall, Nancy and Williamson, John, (2002). *Delivering on Debt Relief: From IMF Gold to a New Aid Architecture*, Institute for International Economics and Centre for Global Development, Washington. [This book addresses one of the central development and poverty issues of the end of the XX century and beginning of the XXI century, namely, debt relief for the Heavily Indebted Poor Countries (HIPC))

Borresen, Pål, and Cosío-Pascal, Enrique, (2002), Role and Organization of a Debt Office, DMFAS Programme Technical Paper 1, UNCTAD/GDS/DMFAS/2, United Nations, New York. [Paper that describes and analyse different types of organization and location of a Public Debt Management Office].

Bolton, Patrick and Skeel, David A. jr., (2010), "How to Rethink Sovereign Bankruptcy", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [Survey on the proposals and possibilities of establishing an International Sovereign Debt Rescheduling Mechanism].

Borensztein, Eduardo, and Mauro, Paolo, (202), *Reviving the Case for GDP-Indexed Bonds*, IMF Policy Discussion Paper PDP/02/10, International Monetary Fund, Washington, September. [This paper revives the case for countries to self-insure against economic growth slowdowns by issuing GDP-Index bonds].

Buchheit, Lee and Ralph Reisner, (1986), *Inter-Creditor Issues in Debt Restructuring*, UNITAR, Mimeo. [Arguments on the utility of an International Sovereign Debt Rescheduling Mechanism].

Buljevich, Esteban, (2005), "The Workout Decalogue: the New Global Approach to Debt Restructurings" in Esteban C. Buljevich, *Cross-border Debt Restructurings: Innovative Approaches for Creditors, Corporates and Sovereigns*, Euromoney Books, London. [Chapter 1 presents a brief history of debt crises, the emerging of the London Approach and its evolution towards the INSOL Principles].

Campos, Camila F.S., Jaimovich, Dany and Panizza, Ugo, (2006), *The Unexplained Part of Public Debt*, Working Paper Nº 554, The Inter-American Development Bank, Washington. [This paper shows that statistically the accumulation of budget deficits does not explain the increase in public debt].

Cassard, Marcel, and Folkerts-Landau, David, (1997), *Risk Management of Sovereign Assets and Liabilities*, IMF Working Paper WP/97/166, Washington. [First attempt to systematise risk management for public finance applying asset-liability-management ALM].

Castellanos, Sara, and Martínez, Lorenza, (2008), "The Development and Challenges Faced by the Mexican Bond Market", in Borensztein, Cowan, Eichengreen, and Panizza (eds.) *On the Verge of a Big Bang? Bond Markets in Latin America*, MIT Press, Cambridge.

Coessens, Hiliana, and de Montpellier, Louis, (1998), "Debt Portfolio Management in the Kingdom of Belgium", in Kari Nars, ed., *Excellence in Debt Management*, Euromoney Publications, London. [Paper that presents the difficulties for evaluating the DMO's performance when the benchmarks include variables that are not directly controllable by the DMO].

Cizauscas, Alfred C., (1979) "*International Debt Renegotiation: Lessons from the Past" in World Development*, the World Bank, Washington. [This article is a historical summary of the early multilateral sovereign debt negotiations that lead to the creation of the Paris Club].

Cosío-Pascal, Enrique, (2007), *The Debt Management Office and the Effective Debt Management Functions: An Institutional and Operational Framework*, LAC Debt Group, Inter-American Development Bank, Washington, January. [This paper addresses the legal and institutional framework for an effective public debt management. It also gives the detail of responsibilities at the ministerial level—executive debt management—and at the DMO level—operational debt management—it also gives an open-ended list of tasks for the front, middle and back office structure of a DMO].

Cosío-Pascal, Enrique, (2008), *The Emerging of a Multilateral Forum for Debt Restructuring*: The Paris Club, UNCTAD Discussion Paper Nº 192, United Nations Conference on Trade and Development, Geneva, November. [This paper gives a historical perspective of XIX and early XX centuries of selected cases of sovereign debt restructuring, as well as their parallel with war reparations and the origins of the Paris Club].

Cosío-Pascal, Enrique, (2010), "Paris Club: Intergovernmental Relations in Debt Restructuring", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [This Chapter gives a historical perspective of XIX and early XX centuries of selected cases of sovereign debt restructuring, as well as their parallel with war reparations and the origins of the Paris Club. It analyses Paris Club Practices and recommends improvements in the treatment of debtor countries by the Paris Club memebers].

Cowan, Kevin; Levy-Yeyati, Eduardo; Panizza, Ugo; Sturzenegger, Federico, (2006) *Sovereign Debt in the Americas: New Data and Stylized Facts*, Inter-American Development Bank, Research Department, Working Paper Nº 577, Washington. [The first paper also is related to the collection of data following the definition of legal jurisdiction. However the data set covers only countries from America plus New Zealand, Pakistan and South Africa for the period 1980-2004 for external debt and shorter periods for domestic debt].

Currie, Elizabeth; Jean-Jacques Dethier, and Eriko Togo (2003), *Institutional Arrangements for Public Debt Management*. World Bank Research Paper 3021. Washington: World Bank. [Paper that presents in detail the institutional arrangements for public debt management].

De la Cruz, Andrés, (2005), "Sovereign Debt Restructurings" in Esteban C. Buljevich, *Cross-border Debt Restructurings: Innovative Approaches for Creditors, Corporates and Sovereigns*, Euromoney Books,

London. [Chapter 16 of the book explores the difference between a government restructuring of debt issued under domestic law and in domestic currency versus restructuring debt issued abroad in foreign currency].

DMFAS/UNCTAD, (1989) Effective Debt Management, UNCTAD/RDP/DFP/DMS/2, Debt Management and Financial Analysis System Programme, United Nations Conference on Trade and Development, Geneva. [First attempt to systematise the functions of Public Debt Management for an Effective debt management at the country level].

DMFAS/UNCTAD, (1993) Effective Debt Management, UNCTAD/GID/DMS/15, Debt Management and Financial Analysis System Programme, United Nations Conference on Trade and Development, Geneva. [Update of the paper Effective Debt Management Functions published in 1989].

Drelichman, Mauricio, and Voth, Hans-Joachim, (Undated), Lending to the Borrower form Hell: Debt and Default in the Age of Philip II, The University of British Columbia and CIFAR, ICREA/Universitat Pompeu Fabra and CREI, forthcoming in The Economic Journal. [History of the bankruptcy of the reign of Philip II, King of Spain, case in which Genoese bankers created a coalition that stopped the king's access to credit].

Eichengreen, Barry and Hausmann, Ricardo, (2003), Original Sin: The Road to Redemption, http:// www.hks.harvard.edu / fs/rhausma /new /RoadtoredemptionEH.pdf October. [This paper proposes the creation of a synthetic unit of account in which claims on a large and diversified group or emerging-market economies can be denominated in order to obtain the redemption of the 'Original Sin"].

Eichengreen, Barry, Hausmann, Ricardo and Panizza, Hugo, (2005a), "The Pain of Original Sin", in Eichengreen, Barry and Hausmann, Ricardo (eds.), *Other People's Money*, Chicago University Press, Chicago. [This paper launches the idea that there is a large range of countries that cannot issue debt only in their currency, and this fact was named "the Original Sin"].

Eichengreen, Barry, Hausmann, Ricardo and Panizza, Hugo, (2005b), "The Mystery of Original Sin", in Eichengreen, Barry and Hausmann, Ricardo (eds*.), Other People's Money*, Chicago University Press, Chicago. [This paper further elaborates on the origins and reasons of the "Original Sin"].

Fisher, Irving, (1930), *The Theory of Interest*, Porcupine Press, Philadelphia. [Publication in which the relation between nominal interest rate and inflation rate is reflected on the real interest rate].

Garay-Salamanca, Luis Jorge, (2010), "The 1980s Crisis in Syndicated Bank lending to Sovereigns and the Sequence of Mechanisms to Fix it", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [This Chapter relates the restructuring process of sovereign countries during the 1980s crises and its outcome].

Gelpern, Anna and Gulati, Mitu, (2010), "How CACs Became Boilerplate", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [This chapter analyses the changes in Collective Action Clauses that introduced revolutionary changes into the borrowers-lenders relationship starting in the late 1900s].

Griffith-Jones, Stephany, and Sharma, Krishnan, (2006), GDP-Indexed Bonds: Making it Happen, DESA Working Paper Nº 21 ST/ESA/2006/DWP/21, United Nations, New York, April. [This paper draws on an extensive survey of the literature, interviews with financial market participants, and the discussions in an expert group meeting (comprising market participants, government officials and representatives from multilateral organizations) held at the United Nations, New York on 25 October 2005].

Guinnane, Timothy, (2004), Financial Vergangenheitsbewältigung: the 1953 London Debt Agreement, Economic Growth Centre, Yale University, Centre Discussion Paper No. 880, New Haven, January. [This paper relates the negotiations and final agreement on World War II war reparations owed by Germany to the Allies].

Hacking, Ian, (1975) *The Emergence of Probability*, Cambridge University Press. [This book relates the origins of calculus of probabilities, given examples, among those the issuing by governments of perpetuities that did not adjust to real life expectation].

Hausmann, Ricardo and Panizza, Ugo, (2010a), Redemption or Abstinence? Original Sin, Currency Mismatches and Counter-Cyclical Policies in the New Millennium, Centre for International Development at Harvard University, Working Paper Nº 194, February. [This paper shows that while the number of countries that issue local-currency debt in international markets has increased in the past decade, this improvement has been quite modest].

Hausmann, Ricardo and Panizza, Ugo, (2010b), Redemption or Abstinence?, Vox, Research-based policy analysis and commentary from leading economists, 21 February, http://www.voxeu.org . [This column argues that, while original sin has diminished and countries are making greater use of their domestic bond market, foreign currency debt is still too risky to be sensible].

Herman, Barry, (2010), "Why the Code of Conduct for Resolving Sovereign Debt Crises Falls Short", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [Advocates for establishing an International Sovereign Debt Rescheduling Mechanism].

Herman, Barry, Ocampo, José Antonio, and Spiegel, Shari, (2010), "Towards a Comprehensive Sovereign Bankruptcy Regim", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [Comprehensive book on the history and perspective of international debt rescheduling and the different ways to fix them, including the analysis for a Sovereign Debt Rescheduling Mechanism].

Hersel, Philip (2002) *Das Londoner Schuldenabkommen von 1953 – Lehren für eine Neue Handels- und Schulden Politik zwischen Schuldnern und Gläubigern*, Erlaßjahr, Düsseldorf. [This paper relates the negotiations and final agreement on World War II war reparations owed by Germany to the Allies].

Hoercher, Karen A., (2006), *Essentials of Managing Treasury*, Hoboken, N.J.: John Wiley & Sons. [A comprehensive review of all the treasury operations for private firms].

Holguín-Torres, Jaime, (2005), Pasivos Contingentes-Colombia, Paper for Dirección General de Crédito Público y del Tesoro Nacional, LAC Debt Group, presented at Debt Strategy Workshop, 26 September, Inter-American Development Bank, Washington. [Example of the application of insurance for managing public contingent liabilities].

Holmgren, Christina, (1998), La renégociation multilatérale des dettes : le Club de Paris au regard du droit international, Bruylant, Bruxelles. [Comprehensive and systematic analysis of the Paris Club practices from the international law perspective].

Hossack, I.B., and G.C. Taylor (1974), A Generalization of Makeham's Formula for Valuation of Securities-Published on the Centenary of Makeham's Classic Paper, *Journal of the Institute of Actuaries*, 101, pp. 89-95, London. [Generalisation of the famous Makeham's formula].

IMF and World Bank, (2001), *Guidelines for Public Debt Management*, Washington. [Recommendations and systematisation of the different aspects of public debt management].

IMF and the World Bank, (2001a), *Developing Government Bond Markets: A Handbook*, International Monetary Fund and the World Bank, Washington. [Comprehensive presentation of several strategies for developing government bond markets].

IMF (2002), *Assessing Sustainability*, May, Washington. [Paper that lays down the theoretical framework and gives examples for assessing debt sustainability].

IMF and the World Bank, (2002) Guidelines for Public Debt Management: Accompanying Document, Washington.

IMF, (2003), "Public Debt in Emerging Markets: Is It too High?" Chapter III of World Economic Outlook, Washington, September.

IMF and the World Bank, (2003a), Amendments to the Guidelines for Public Debt Management, Washington. [Review of the 2001 publication, in particular because the introduction of Collective Action Clauses to bond issues by some emerging market countries].

IMF and the World Bank, (2007), Strengthening Debt Management Practices: Lessons from Country Experiences and Issues Going Forward, Washington. [Survey on the implementation of the 2001 publication, including the setup for the legal and institutional frameworks].

Jaimovich, Dany and Panizza, Ugo, (2006), Public Debt around the World, Inter-American Development Bank, Research Department Working Paper Nº 561, Washington [Collection of data following the definition of legal jurisdiction. However the data set covers only countries from the Americas plus New Zealand, Pakistan and South Africa for the period 1980-2004 for external debt and shorter periods for domestic debt].

Jeanne, Olivier, and Guscina, Anastasia, (2006), Government Debt in Emerging Market Countries: A New Data Set, IMF Working Paper, WP/06/98, Washington, April. [This paper presents a new database

on government debt in 19 emerging market countries since 1980. The data set focuses on the structure of debt in terms of jurisdiction of insurance, maturity, currency composition and indexation].

Kalderen, Lars, et al. (1989), Debt Management and the Developing Countries: A Report to the UNDP by an Independent Group of Experts, United Nations, New York. [This is the first systematic research on debt management practices around the world].

Krueger, Anne O. (2002), *A New Approach to Sovereign Debt Restructuring*, International Monetary Fund, Washington. [Formal proposal for an International Sovereign Debt Rescheduling Mechanism].

Laeven, Luc and Valencia, Fabian, (2010), Resolution of Banking Crisis: The Good, the Bad and the Ugly, IMF Working Paper, WP/10/146, Washington, June. [This paper presents a new database of systemic banking crises for the period 1970-2009. While there are many commonalities between recent and past crises, both in terms of underlying causes and policy responses, there are some important differences in terms of the scale and scope of interventions].

Magnusson, Tomas, Prasad, Abha and Storkey, Ian, (2010), Guidance for Operational Risk Management in Government Debt Management, Economic Policy and Debt Department, The World Bank, Washington, March. [Comprehensive presentation of all aspects that a DMO ought to take into account for minimising operational risk].

Makeham, W.M. (1874), On the Solution of Problems Connected with Loans Repayable by Installments, *Journal of the Institute of Actuaries*, 18, pp. 132-143, London. [Original paper demonstrating that for bonds redeemable in fine the market value can be calculated without dealing with the whole cash-flow series].

Mehran, H., ed. (1985), *External Debt Management*, International Monetary Fund, Washington. [Paper where for the first time the systematisation of the Public Debt Management Functions was presented].

Moulton, Harold G. and Leo Pasvolsky, (1932) *War Debts and World Prosperity*, Brookings, Washington. [The book is a comprehensive historical perspective of war debts and their linkage to economic growth].

Panizza, Ugo, (2010), "Is Domestic Debt the Answer for Debt Crises?", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [Paper that argues that domestic issues by governments is not a solution to the so called "Original Sin"].

Polackova, Hana, (1998), Government Contingent Liabilities: A Hidden Risk to Fiscal Stability, World Bank Working Paper 1989, Washington. [Comprehensive analysis of all contingent liabilities that may represent a hidden risk to fiscal sustainability].

Polackova-Brixi, Hana, and Schick, Allen eds. (2002), *Government at Risk: Contingent Liabilities and Fiscal Risk*, the World Bank, Oxford University Press, New York. [Comprehensive analysis of all contingent liabilities that may represent a hidden risk to fiscal sustainability including examples for different countries].

Reinhart, Carmen M., and Sbrancia, M. Belen, (2011) The Liquidation of Government Debt, Working Paper Series, WP 11-10, Peterson Institute for International Economics, April 2011, Washington. [This paper shows that financial repression is most successful in liquidating government debt: this is a consequence of negative real interest rates].

Round, Robin, (2003), Finding Real Solutions to Unsustainable Debt: A Comparative Analysis of the IMF's Sovereign Debt Rescheduling Mechanism and the Fair and Transparent Arbitration Process, Halifax Initiative Discussion Paper, Toronto and Vancouver, March. [This paper makes a comparative analysis of the IMF's Sovereign Debt Rescheduling Mechanism and other proposals].

Rojas-Suárez, Liliana, (2010), The International Financial Crisis: Eight Lessons for and from Latin-America, Working Paper Nº 202, Centre for Global Development, Washington, January 2010. [This article analyses the policies of Latin-American countries in front of the financial crisis that started in 2008].

Roy, Arindam, and Williams, Mike, (2010), Government Debt Management: A Guidance Note on the Legal Framework, Commonwealth Secretariat, London, October. [Systematic presentation of the requirements for an efficient legal framework for public debt management].

Ruban, Oleg; Ser-Huang Poon, and Vonatsos, Konstantinos, (2007), *GDP Linked Bonds: Contract Design and Pricing*, University of Manchester, Oxford Road, Manchester, 15 March. [This article presents a model that allows obtaining prices and defaulting profiles for vanilla bonds and various GDP linked structures that could be issued by emerging market countries].

Setser, Brad, (2010), "The Political Economy of the SDRM", in Herman, Barry; Ocampo, José Antonio, and Spiegel, Shari, *Overcoming Developing Country Debt Crisis*, Oxford University Press, New York. [Critical historical perspective of the proposal for a Sovereign Debt Rescheduling Mechanism].

Shadow Regulatory Committee, (2007), Statement Nº 253, Would Basel II have helped Prevent the Subprime Turmoil? the Shadow Financial Regulatory Committee, Chicago, 10 December 2007. http://www.aei.org /docLib /20071210_ShadowStatement253.pdf . [This is a critical analysis by the Committee on the implementation of Basel II].

Suratgar, D., (1981), Note on Procedural Guidelines for Renegotiating LDC Debt: An Analogy to Chapter II of the U.S. Bankruptcy Reform Act, 21 Va. Journal of International Law 305. [The first proposal for an international Sovereign Debt Rescheduling Mechanism].

Suratgar, D., (1984), "The International Financial System and the Management of the Debt Crisis" in Default and Rescheduling: Corporate and Sovereign Borrowers in Difficulty, D. Suratgar ed. [An update of the earlier proposal in 1981 on an international Sovereign Debt Rescheduling Mechanism].

Suter, Christian and Hanspeter Stamm (1992), "Coping with Global Debt Crises: Debt Settlements, 1820 to 1986," Comparative Studies in Society and History, vol. 34, No. 4 (October), pp. 645-678. [This article deals with the series of debt crisis and its respective means to settle them from early XIX century to late XX century].

Togo, Eriko, (2007), Coordinating Public Debt Management with Fiscal and Monetary Policies: An Analytical Framework, The World Bank, Banking and Debt Department, Debt Management Advisory Services, Policy Research Working Paper WPS4369, Washington. [This paper put forward reasons for having public debt management as a policy in itself as are fiscal and monetary policies].

UNCTAD, (1983), International Financial and Monetary Issues, UNCTAD VI, Policy paper for item 11, TD/275, Belgrade June 1983. [This background paper for the UNCTAD VI contains all the elements and the analysis of the financial problems of developing countries at the beginning of the 1980s debt crises].

UNCTAD, (1986), *Trade and Development Report*, 1986, New York. [Includes the proposal for an International Sovereign Debt Rescheduling Mechanism].

UNCTAD (1989), *Effective Debt Management*, UNCTAD/RDP/DFP/ DMS/2, Geneva. [This paper is the first effort to systematise the legal and institutional framework for an effective public debt management].

UNCTAD (1993), *Effective Debt Management*, UNCTAD/GID/DMS/15, Geneva. [This paper is an updated version of the previous paper of 1989].

Vásquez, Ian, (2002), A Retrospective on the Mexican Bailout, *Cato Journal*, Vol. 21, Nº 3 (Winter 2002), Cato Institute, Washington. [This article summarizes the Mexican bailout of private banks by the government in mid-1990].

Wheeler, Graeme, (2004), *Sound Practice in Government Debt Management*, the World Bank, Washington. [Comprehensive presentation of all aspects of public debt management].

Williams, Mike. (2004), *Government Cash Management: Good and Bad Practices*, http://www.mj-w.net/. [A systematic presentation of cash management practices by the public debt office]

World Bank, (2007), *Managing Public Debt: From Diagnosis to Reform Implementation*, World Bank Treasury, Washington. [Survey paper that reviews the "Guidelines" and its implementation stressing the need for reforms for a successful implementation of those].

Wynne, William H., (2000) *State Insolvency and Foreign Bondholders: Selected Case Histories of Governmental Foreign Bonds Defaults and Debt Readjustments*, Bear Books, Washington. [This book is a very comprehensive inventory (in spite of the title) of sovereign bond default in the XIX century and early XX century].

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**Dr. Cosío-Pascal** obtained his Doctorate in Econometrics with Professor Edmond Malinvaud at the University of Paris I, Pantheon-Sorbonne, in 1975. He also holds a B.Sc. in Applied Mathematics option Actuary, a M.A. in Economics and a M.Sc. in Mathematical Statistics. Dr. Cosío-Pascal is a Statistician-Economist from the French "Ecole Nationale de la Statistique et de l'Administration Economique" (ENSAE). Dr. Cosío-Pascal worked for UNCTAD for 22 years where he founded and developed the Debt Management and Financial Analysis System Programme (DMFAS) that provides technical assistance—around 70 countries—to governments on public debt management. He was the Chief of the Debt and Development Finance Branch (DDFB), in which quality represented UNCTAD to the Task Force on Financial Statistics (TFFS), drafting the "External Debt Statistics: Guide for Compilers and Users". Before working for UNCTAD, Dr. Cosío-Pascal was a staff member of the General Directorate of International Financial Affairs at the Ministry of Finance in Mexico. Presently, Dr. Cosío-Pascal is a Free Lance consultant on debt management and public finance, in which quality have undertaken missions for the International Monetary Fund, the World Bank, the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, UNCTAD, UNDP, UNITAR and regional economic and financial organisations like MEFMI and the LAC Debt Group.