

# ***Macroeconomics and Sovereign Risk Ratings***

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## **Introduction**

The overall purpose of this paper is to analyze the concept and determinants of “sovereign risk” and the role of the credit risk rating agencies which serve internationally as the main reference instruments employed by economic agents to assess this risk. The paper describes the nature of risk ratings together with the actual risk rating process employed by the agencies and points to a group of macroeconomic variables observable as part of this process.

The aim is twofold. Firstly, to set out what is meant by “sovereign risk” - distinguishing it from, and comparing it with, other types of risk and describing how the rating agencies approach such risk. An attempt is made to identify how risk rating can influence macroeconomic factors, especially in the case of emerging economies considered to present a high risk.

A second objective is to investigate the possibility of identifying macroeconomic variables which could be associated with sovereign risk ratings awarded by the rating agencies to each country. If this exercise proves valid, it follows that the results will effectively constitute a set of indicators which emerging economies would be well advised to improve upon, given that agency-generated risk ratings of a given country carry a series of knock-on effects regarding that country’s macroeconomic management.

Chapter 1 deals with the meaning of sovereign risk ratings as qualitative assessments of the probability of default by central governments. This reveals the corresponding link between classes of risk and the default history of both private-sector and sovereign bonds.

On the securities market, “risk premia” signals the minimum rate of return demanded by purchasers of particular assets. In this context, ratings assigned to different assets or to their subgroups by the agencies are included among the factors that affect calculation of the risk premia and the pricing of the assets by economic agents.

Despite the peculiarities and idiosyncracies of risks - and their associated risk premia - linked to one particular type of asset, factors common to subgroups of assets can also be detected: risk factors that can be effectively identified, measured and applicable in a wider context. Sovereign risk, country risk, convertibility risk, currency exchange risk and others are examples of the broad categories of risk inherent in subgroups of assets throughout the world’s financial system.

Chapter 2 points to the conceptual differences between sovereign risk and country risk – different despite sharing a common “ancestry” and frequently converging in the light of a number of determinants they have in common. Notwithstanding the conceptual differences between the two classes of risk, we focus on the close relationship between sovereign ratings and sovereign spread of the EMBI+ index, which is the most frequently used instrument to measure sovereign risk premia charged in the secondary bond markets of emerging economies and which has customarily been used to measure “country risk”. While indices such as the EMBI+ are subject to intense short-term swings, sovereign risk ratings tend to reflect changes with a longer lifespan and generally have a bearing on

events with broader and deeper consequences. Over the long term, convergence between the two - sovereign and country risk - can be expected.

Indices such as the EMBI+, assembled on the basis of price movements in emerging economy secondary bond markets, are related to the borrowing costs of sovereign or private bond issuers. Therefore the correlation and possible causality between qualitative ratings of sovereign risk on the one hand and indices of the premia charged in the secondary sovereign bond markets on the other are important factors given that they have a bearing on the interest rates in emerging economies. This is a direct channel of influence exercised by risk ratings on the macroeconomic management of emerging economies.

Chapter 3 describes the actual process of sovereign risk assessment by the rating agencies. Such evaluations emerge as the end-result of interdisciplinary work combining analysis based on quantitative methods with a discretionary approach by analysts to judge qualitative parameters.

Finally, Chapter 4 examines possible macroeconomic variables taken into account in the course of sovereign risk assessment by the agencies and the relationship between these variables and the ratings. After examining the indicators on an individual basis, their potential as a group is tested as a determinant of the class of sovereign risk into which national economies fall.

The paper concludes (confirming other studies in the international literature) that empirically most of the differences between the risk ratings of countries can be explained - insofar as sovereign risk is concerned - by a relatively small number of variables. The results show that a high rating (ie: low sovereign risk) is associated with the following: high *per capita* income in dollar terms; low inflation (measured by consumer price indices); high economic growth; low total external debt/current account receipts ratio; low central government gross debt/ total fiscal receipts ratio; an absence of default events since 1975; and finally, a pronounced level of commercial openness as measured by trade flows (the sum total of exports and imports as a percentage of GDP).

The general conclusion of the paper is to suggest that emerging economies should make efforts to seek improvements *vis-à-vis* this group of indicators as a path towards earning higher sovereign risk ratings. In addition to spin-off benefits in terms of lower real interest rates as the result of a risk *upgrading* across the classes of risk, improvements in the respective indicators would help to underpin the overall macroeconomic health of emerging economies.

## **1. Definition and Role of Sovereign Risk Ratings**

Financial transactions call intrinsically for information asymmetries to exist between investors and borrowers. Borrowers need to be more familiar with their own payment capacity and willingness to pay than the resource providers. From the creditors' point of view, asymmetry will have an effect on the premia in view of the credit risks which form part of any credit and securities operation .

Financial transactions come to fruition only when the means are in place to reduce the negative weight of information asymmetries: assembling and processing information prior to operations; drawing up contracts and monitoring execution of these in order to control the use to which the funds are put after they are transferred; introducing guarantees so as to minimize losses in cases of default or failure of the debtor, thereby enhancing a debtor's willingness to pay etc. However, while costs are attached to such procedures, the relevant mechanisms are not always adhered to sufficiently rigorously to sidestep problems.

In cases where there are no legal and judicial or institutional instruments to underpin compliance with contracts and exercise of guarantees, information asymmetry and the premia charged as compensation for the credit risks increase and in the worst case render financial transactions unviable. As for the private and public credit risk rating agencies and institutions, they are in a position to assemble and process information in advance of operations. Whether as information generating facilities for exclusive use within a particular economic group or as providers of services for clients, the agencies evolve specific skills and benefit from economies of scope and scale in the business of analysis and credit risk rating. It is this approach that endows them with their *raison d'être* and makes them a viable proposition from an economic standpoint.<sup>1</sup>

Strictly speaking, agencies specialized in providing ratings as a commercial product have become a necessary factor for ensuring that the supply of financial resources in any economy is not confined to banks – institutions which possess special expertise in assembling and processing information regarding the status of their clients, with whom they maintain close relationships as an intrinsic part of their commercial operations. Given the remote and impersonal nature of the relationship between investors and borrowers - which differentiates banks from the capital markets (shares and credit instruments negotiable in secondary markets) - the development of the latter calls for the services of risk-rating firms.<sup>2</sup>

Within this context, a particular risk is “sovereign risk” - credit risk associated with operations involving credit for sovereign states. The requirement to guarantee exercise and to monitor contract compliance obviously differs from the requirements governing credit for private agents or subnational and non-sovereign sectors in the public sphere. Moreover, the determinants for payment capacity and of willingness to repay debt are of a different nature, reflecting macroeconomic variables such as the available stock of foreign currency reserves and balance of payments flows, economic growth prospects and capacity to generate tax receipts, a variety of political factors etc. The principal international official and private credit risk rating agencies - Moody's, Standard & Poor's (S & P) and Fitch - regularly carry out sovereign risk rating exercises even though, in the

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1. A common error among laymen is to confuse the activities of the agencies and their ratings with recommendations related to the purchase and sale of bonds by financial institutions and their clients concerning adjustments to portfolios used as benchmarks.
  2. When overcoming information asymmetries turns high-cost or difficult, bank credit ceases to exist and credit operations are confined to “friendly” loans (from relatives or personal friends, the informal credit sector etc). This can occur with certain sectors of the economy (poorer population, micro-businesses etc ), or even with entire economies.

case of the aforementioned, this is not their main economic activity (being private sector agencies).

The agencies rate debtors as well as specific bond issuance. Occasionally in cases where the guarantees or contract clauses ensure that a particular bond is safer than the guarantee based on the overall assets of the issuer, the rating of the paper in question can effectively be higher than the rating awarded by the issuer.<sup>3</sup>

Regarding the currency in which the debt is denominated, the ratings may refer to financial obligations denominated either in national or foreign currency. As for the maturity terms involved, the ratings can reflect long-term and short-term obligations, the latter comprising bonds due to mature in under one year.

As in the other cases of risk, the rating agencies dealing with sovereign risk seek to assess the capacity and willingness of a sovereign government to service its debt within the maturity dates and in accordance with the conditions agreed with the creditors at the time the loans were contracted. The outcome of this assessment is synthesized in ratings, which essentially are estimations of the probability of a given government defaulting - default meaning not only the suspension of interest payments or non payment of the principal at maturity date but also its swap or “involuntary” restructuring. The subjective nature of the term “involuntary” defies a more precise definition since operations are examined on a case-by-case basis. The main factor to be taken into account is the eventuality of a substantial reduction in the net present value of the bond following a swap or restructuring exercise.<sup>4</sup>

It is important to note that the sovereign ratings refer only to the capacity and willingness of a central government to honor its debts with private creditors. The ratings are therefore an estimation of sovereign risk - they do not refer to bilateral credits or to debts contracted with multilateral lending institutions such as the World Bank and the IMF (Bhatia, 2002) or directly to the probability of default by subnational governments or by state-owned or private enterprises.

Depending on the agency, the ratings may also incorporate some expectation of recovery of principal. Moody's ratings are indicators of expected loss which is an outcome of the probability of default and the expectation of monetary loss incurred by the defaulting party (Moody's, 1999 and Bhatia, 2002). Fitch on the other hand restricts itself to evaluating only the probability of default before it occurs and subsequently to differentiating the agency's assessments on the basis of recovery of principal (Fitch,

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3. This happened with an issue by the company Aracruz in 2002 for US\$250 million, which was awarded an “AAA” rating - the highest - by Fitch while the rating of the same firm was “B” - one of the lowest. The 2002 issue was backed by the unconditional guarantee of a foreign company (*Agencia Estado*, 7/08/2003).

4. However, even in the event of gain in terms of present value, there may be cases in which creditors are compelled to participate in the operation due to eg: a tacit or explicit sign by the government that the alternative to the swap is suspension of debt service. By way of illustration, the three agencies did not consider the swaps or debt restructurings by the governments of Argentina between May and June 2001, by Venezuela in 2002 and 2003, by Turkey in June 2002, and by the Russian government in 1998 to be “involuntary”. Swaps by the governments of Uruguay in May 2003 and Argentina in November 2001 were considered to be involuntary. For further details on the definition of default, refer to Bhatia (2002), Moody's (2003a), Standard & Poor's (1999) and Fitch (2003a).

1998 and Bhatia, 2002). In the case of S & P, its ratings seek simply to reflect the probability of default and do not refer to its magnitude, the period during which the government will remain in default, the terms of a possible renegotiation or to the expected amount involved in the recovery of principal (Bhatia, 2002).

Each agency has its own rating taxonomy, making valid comparisons difficult. In general, the ratings are variations of the scale A, B,C or D. On the scale employed by S & P and Fitch, the top rating is “AAA” and the bottom “D”. On Moody’s rating scale, the best is “Aaa” and the worst “C”. The lower the rating, the bigger the probability of default, and vice versa. Governments rated above “BBB” or “Baa3” are known as “investment grade”, while those rated below fall into the “speculative grade” category.

In order to differentiate between governments in the same category, S & P and Fitch adopt arithmetical symbols (+ and -) and Moody’s a number-based score (1, 2 and 3). The highest categories (AAA and Aaa) and the lowest (CC, Ca or less) are not differentiated by numbers and symbols in this way.

A frequently-used procedure in an effort to provide a basis for ratings comparison is to adopt some form of transposition (linear or non-linear) by converting agencies’ letter-grades into numerical scores. Table 1 below outlines the conversion procedure proposed by Bhatia (2002).

**Table I: Linear Transposition of Rating Scale**

S&P	Fitch	Moody's	Numerical Scale
<i>Investment Grade</i>			
AAA	AAA	Aaa	1
AA+	AA+	Aa1	2
AA	AA	Aa2	3
AA-	AA-	Aa3	4
A+	A+	A1	5
A	A	A2	6
A-	A-	A3	7
BBB+	BBB+	Baa1	8
BBB	BBB	Baa2	9
BBB-	BBB-	Baa3	10
<i>Speculative Grade</i>			
BB+	BB+	Ba1	11
BB	BB	Ba2	12
BB-	BB-	Ba3	13
B+	B+	B1	14
B	B	B2	15
B-	B-	B3	16
CCC+	CCC+	Caa1	17
CCC	CCC	Caa2	18
CCC-	CCC-	Caa3	19
CC	CC	--	20
C	C	--	21
SD <sup>1</sup>	DDD <sup>3</sup>	Ca <sup>4</sup>	22
D <sup>2</sup>	DD	C	23
--	D	--	24

Sources: Bathia (2002), Moodys, Standard and Poor's e Fitch.

1. Selected Default.

2. Default.

3. Default. Ratings of obligations are based upon the possibility of total or partial recovery of the loan. The figures involved in expected recovery concern highly speculative amounts which cannot be precisely estimated. Nevertheless the following estimations serve as guidelines: "DDD" represents the highest potential for recovering the amounts invested in defaulting bonds - between 90% and 100% of principal and interest, "DD" indicates a recovery probability between 50% and 90%, and "D" represents the least possibility of recovery eg: less than 50%.

4. Sovereign debtors rated as Ca and CC are generally in default, offer low financial security and the probability of principal and interest recovery by investors is very low.

(--) Not applicable.

For each government assessed, the agencies publish their findings on the probable direction that the risk rating will take over the medium term (one to three years). This indicator is known as an *outlook* which can be positive, negative, stable or developing.<sup>5</sup> When the possibility of a change emerges in the sovereign risk rating of a particular government, the agencies may place it on a separate list. Moody's calls it *Watchlist* indicating the possible direction that the rating might take over the following 90 days : 'upgrade', 'downgrade' or 'undefined'.<sup>6</sup> The Fitch listing is called a *Rating Alert*, and that operated by S & P is known as the *CreditWatch*, referring to ratings as 'positive', 'negative' or 'undefined.'

Risk ratings are straightforward indicators available in the public domain (the rating agencies make their listings available regularly on their *Internet* sites) which contribute

5. This is rarely made and means that the rating change is subject to the occurrence or not of a specific fact. In May, for example, Moody's list contained only a development outlook referring to Venezuela.

6. Historically, about 70% of all the corporate ratings were modified in the same directions indicated in the "watch list" (Moody's 2002b).

to reduce uncertainties regarding the risks involved with government bonds. For those economic agents who use ratings as a substitute for their own efforts in the collection and processing of information on sovereign risks, ratings published by the agencies help to make operations involving sovereign bond issues viable. This is mainly the case of emerging economies which, without risk ratings, would be confined to more limited access to external funds, incurring higher costs in the process (Cantor and Parker, 1995). Rated government bonds are preferred by lenders to those of governments which are not risk-rated. Ratings are also widely employed by investors to determine prices and to take decisions regarding buying and selling public external debt securities.

Large institutional investors such as pension funds have internal management rules of their own or follow of regulatory bodies legislation which put a ceiling on the holding of assets rated at “speculative grade” (IMF,1999). Others build their investment portfolios on the basis of partly the agency ratings, partly their in-house attitudes towards risk. Banks and other financial institutions, adhering to their own internal regulations and their country’s financial legislation, use ratings to determine capital requirements (Canuto, 2002 and Canuto and Lima, 2002).<sup>7</sup>

The fairly widespread use of the risk ratings to manage risk exposure is a sign that investors consider them to be appropriate indicators of the probability of default. Table II below shows the accumulated Default Rates of sovereign borrowers and companies over periods of 1, 5 and 10 years by ratings, according to Moody’s.<sup>8</sup> Each DR listed emerges from the following type of question: on average, which percentage of companies or sovereign governments rated as B defaulted within 5 years. In the table below, it can be seen that this occurred with 22.2% of sovereign debtors and 33.2% of private firms. For a sufficiently large number of observations, the DR tends to become an Estimation of Probability of Default given the class of risk.

Judging by Table II, the connection between DRs and rating classes is consistent.<sup>9</sup> The frequency of default in the “speculative grade” categories is higher than that in the “investment grade” class. History of default increases in line with a lowering of the rating and over a longer time lag .

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7. For the role of ratings in the capital markets see also Moody’s (1997).

8. The three agencies publish annual papers where the DRs are calculated for firms but at the time the present paper went to press only S & P and Moody’s had published the DRs referring to sovereign debts. The sovereign default rates given by Moody’s are the most recent available. See Moody’s (2003), Fitch (2003b) and Standard and Poor’s (2002a).

9. With an exception for the DRs of the sovereign ratings Caa,Ca and C for the period of one year which is zero, when it would be expected to be over and above rating class B. The relatively small size of the sample of sovereigns can be one explanation for the emergence of this problem. While the calculation of the DRs of firms includes thousands of observations and dozens of default episodes, the sample referring to sovereigns covers only 88 observations, with 8 cases of default. The agencies expect that over time the values of the DRs of sovereigns and companies will converge.



**Table II: Cumulative Default Rates by Rating**

Rating	Sovereigns			Corporate		
	1 year	5 years	10 years	1 year	5 years	10 years
Aaa	0,00	0,00	0,00	0,00	0,00	0,07
Aa	0,00	0,00	0,00	0,02	0,20	0,43
A	0,00	0,00	0,00	0,03	0,56	1,21
Baa	0,00	0,00	0,00	0,19	2,16	4,70
Ba	1,56	12,62	40,59	1,39	12,99	23,13
B	7,89	22,22	53,38	6,44	33,18	51,14
Caa, Ca, C	0,00 <sup>2</sup>	n.s. <sup>3</sup>	n.s. <sup>3</sup>	22,82	59,44	82,51
Investment Grade	0,00	0,00	0,00	0,07	0,87	1,82
Speculative Grade	3,87	16,59	45,39	5,45	25,06	37,77
Total sovereigns/companies	1,19	4,68	9,34	1,86	8,25	11,76

Source: Moody's (2003).

1. The accumulated rate of default indicates average percentage of sovereigns or firms that went into default during a certain period (in this case 1, 5 or 10 years) given their rating. For example, on average 40.59% of sovereigns and 23.13% of companies rated as B remained in default for up to 10 years. For more details regarding methods and of calculation see Moody's (1995).

2. A significantly lower Default Rate in this rating with relation to B rating maybe the result of the limited number of observations (88 rated sovereigns and 8 default events).

3. Not Significant. No debt issuer was rated Caa, Ca or C, for over two years before the end of the sampling.

Ratings do not attempt to forecast suspension of payments. They are indicators of relative risk. For example, the fact that a given company is rated as "Aa" does not mean that the company will necessarily remain creditworthy, but only that this situation tends to occur more frequently over time than in the case of firms with lower risk ratings. Default rates are sensitive to economic factors at the time that they are calculated and vary considerably in line with world and local economic cycles (Moody's, 1997).

The agencies and their ratings are nowadays an important ingredient in the dynamic of international financial markets. Up to the 1980s, the main providers of external credit to governments were a small group of major international banks. Today, with bonds and securities largely replacing syndicated loans as the main borrowing instruments, potential creditors form a larger, more widely dispersed and heterogeneous grouping.<sup>10</sup> The difficulties arising from macroeconomic data comparisons together with the complexity and diversity of the economies of the countries involved - with a larger pool of countries resorting to the international credit market on a regular basis - put in-house sovereign risk assessment out of the range of the great majority of investors.

During the Asian crisis, much unfavorable comment was leveled at the agencies (Reinhart, 2002) (Sy, 2003). The main criticism was that the "investment grade" ratings awarded to Thailand, Korea and Indonesia at the beginning of 1997 failed to reflect fully the risk of holding external debt paper of these governments. On the other hand, none of the three governments suspended their sovereign debt servicing despite the serious crises afflicting them.<sup>11</sup> In their defense, the agencies have asserted that ratings do not aim to indicate when a default will occur or whether the sovereign debtor will have to deal with a balance of payments crisis. As for sovereign borrowers in the "investment grade"

10. For example, 43.5% of the external debt bonds of the Argentine government belong to individuals and the remainder to institutional investors. These bonds are denominated in 7 different currencies and are subject to 8 separate jurisdictions (*Economist Intelligence Unit- EIU*, 2003).

11. Subsequently, the following suspended payments on other liabilities rated by the agencies: bank deposits in the case of Korea in 1998, and private bank loans in the case of Indonesia in 1999 and 2001 (Moody's, 2003a).

category, the agencies' maintain that these will as a rule face less crises episodes and are more able to manage them than sovereign borrowers in the "speculative grade" category.

However, the ratings applied to the Asian countries at the time should also have drawn attention to a specific risk<sup>12</sup>: the prospect of balance-of-payment crises influencing governments' capacity to pay out on sovereign paper. The fact is that central government external debt default events have been frequently, although not always, accompanied by balance-of-payments crises, major foreign exchange devaluations, domestic economic recession and restrictions on capital repatriation - all characteristic of emerging economies that are net absorbers of foreign capital within an environment marked by substantial capital mobility and by the dominant position assumed by capital accounts movements over the balance of payments current accounts. Crises in emerging economies therefore tend to be generally regarded as "twin crises", combining on the one hand capital flight and exchange problems and on the other some domestic body having to confront asset positions weakened by the sudden drying-up of the external sources required to sustain them. In the case of Asia in 1997-98, the weaker plank was the domestic banking and corporate system, while in Latin America it was generally a case of the fragile financing of the public sector (Canuto, 2001).

Again, the agencies argued that much of the information required for assessing the payment capacity of the Asian countries was not available before the crisis. Specifically, the official data that was available underestimated the credit defaults/total banking sector credits ratio, the negative level of net international reserves of the Central Bank of Korea, the debt stock denominated in foreign currency of the Indonesian private sector and the size of exchange futures market operations of the Thai Central Bank. After the Asian crisis, the agencies began to focus more attention on the external liabilities of the private financial sector, in particular short-term liabilities, as well as on the possibility that these might turn into public liabilities following a crisis. The agencies also began to assess more carefully the contingent liabilities of the public sector (as we shall see in the more detailed discussion of risk assessment methodology below).

In spite of the criticisms and shortcomings of sovereign risk assessment, the importance of ratings has tended to increase. Their use as a parameter of financial regulation is now widespread in the United States. Ratings increasingly influence decisions in both developed and developing countries. The Committee for the Revision of the Basel Agreement discussed for example the possibility of using ratings as reference benchmarks to establish minimum risk-weighted capital requirements for credits for sovereign governments. The weightings are currently determined in the following way: if the country is an OECD member, the risk weighting is zero; for non-OECD members, the weighting is 100. The proposal under discussion suggests that these weightings would vary in accordance with the risk rating given to the country by the international

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12. For a discussion about the performance of the agencies during the financial crises of the emerging markets in the 1990s, see IMF (1999). Sy (2003), dealing with the period 1994 to 2002, concludes that sovereign ratings do not anticipate exchange crises, normally being adjusted after the emergence of the crisis. Neither was any close relationship found between exchange crises and the probability of sovereign default. However, the sovereign ratings and changes in them help to predict external debt crises defined as rises above 10 percentage points (or 1000 base points) of the difference between the yields on sovereign bonds denominated in dollars and US Treasury bonds with similar features (*spread*).

agencies as well as by the export credit guarantee agencies of the developed countries comprising the so-called G-10.<sup>13</sup>

## **2. Sovereign Risk, Country Risk and Risk Premia**

Although closely related, “sovereign risk” and “country risk” are different concepts. Country risk is a broader concept than sovereign risk - effectively the risk of exposure to default by other creditors residing in a country which itself is associated with factors which may be under the control of the government but not subject to control by private firms or individuals (Claessens and Embrechts, 2002). This is the case for example of private companies which have both the capacity and willingness to enter into commitments with foreign creditors but which come up against convertibility or currency transfer risks occasioned by the possibility of capital controls being suddenly introduced by the sovereign state.

Country risk encompasses all the financial assets of a given country constituting a backdrop for a possible compensatory premium on the return that these issues offer. The two types of risk - country and sovereign - have a similar lineage since a default on the sovereign debt can exercise a negative impact on the remaining capital flows for the country, as well as impinging on external private debt. Conversely, with no foreign currency available, the sovereign state becomes incapable of fulfilling its foreign currency-denominated debt commitments. However, distinctions still need to be made between the two concepts. As we have observed in the Asian case, the twin crises in the exchange market and the domestic private financial area erupted without incurring equivalent risks in the sovereign debt area. In Russia, the opposite occurred - the public debt crisis did not interrupt a number of private payments to foreign creditors.

In contrast to the 1980s, the practice (not always particularly successful) which has prevailed among governments during balance-of-payments crises has been to attempt to avoid a generalised moratorium. This is probably a bi-product of deeper economic and financial integration in the 1990s, which led to substantial growth in the role of the external sector, particularly in the emerging markets. Many firms in the latter make extensive use of the external credit market to secure access to direct foreign investment finance as a key contribution to their development. Thus, the imposition of extensive exchange controls can certainly generate protracted difficulties for companies trying to gain access to resources abroad. Controls could also reduce direct foreign investment flows in general, causing substantial damage to the economy of the country involved (Claessens and Embrechts, 2002).

As a general rule, sovereign rating represents an upper ceiling for other creditors of a country. But this can in effect be exceeded in special situations when the rating agencies reckon that particular debtors are less vulnerable to “transfer risk”. For example, as from June 2001, Moody’s began to apply its sovereign ceiling policy more flexibly in view of the recent default episodes in Pakistan, Ecuador, Russia and Ukraine - where governments permitted foreign currency payments to be made to certain privileged categories of debtor. Typically these consisted of heavyweight firms with extensive access to financing in the international markets for their operations and which could, in

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13. For further information on the use of the ratings in regulatory processes and about the review proposals of the Basel Agreement, see IMF (1999) and Canuto and Lima (2002).

the event of their non-compliance with debt obligations, further aggravate the economic situations in those countries (Moody's, 2001).

According to the agencies, five factors are assessed which could push the rating of a particular firm above this sovereign ceiling: (i) the probability of a generalized moratorium in the case of default by the central government; (ii) the amount of the debt, taking into account the guarantees given; (iii) the conditions attached to access to foreign currency on the basis of regular large-scale exports, assets held abroad, existence of a foreign owner or other sources of external support; (iv) integration with global production and supply networks and (v) the importance of the firm or firms involved with respect to the national economy and international capital markets.

The sovereign and country risk ratings applied to other securities issued by a government are important because they have a direct bearing on asset prices and can help to determine the size of the potential buyer base. The differential return on assets with risk attaching to them by comparison with those assets considered to be risk-free is determined by general liquidity circumstances, by the level of investors' aversion to risk and by the particular risk that investors attribute to each asset. Information asymmetry, if not attenuated, intensifies risk aversion. When agency ratings are employed as instruments for determining credit risk, the ratings tend to be reflected in the prices of the assets as well as in the premia charged to cushion such risks.

The best known market indicators as far as risk premia for emerging economy bonds are concerned are the EMBI+ and that produced by J.P.Morgan.<sup>14</sup> This index is composed of a basket of bonds denominated in foreign currency issued by central government of a number of emerging countries and which are negotiated in secondary markets.<sup>15</sup> The EMBI+ comprises mainly external debt paper (*Bradies* and *Eurobonds*) but it can also include traded loans and domestic bonds denominated in foreign currency.<sup>16</sup>

J.P Morgan produces the index levels and sovereign spreads. The index represents a weighted average based on volume negotiated in the secondary market of the prices of bonds comprising the basket; the sovereign spread represents the difference between each country's sovereign bond yields relative to US treasury bonds with similar features, considered to be zero risk (Aaa/AAA, according to agencies' ratings). The EMBI+ can be sub-divided into two sub-indices for each country. The sovereign spread of these sub-indices is usually referred to as "country risk".

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14. *Emerging Markets Bond Index Plus*.

15. In September 2003, the EMBI+ comprised the following: Argentina, Brazil, Mexico, Russia, Venezuela, Turkey, Phillipines, Colombia, Malaysia, Bulgaria, Peru, South Africa, Panama, Ecuador, Poland, Ukraine, Egypt and Nigeria. For further details on index compilation methodology see J. P. Morgan (1995).

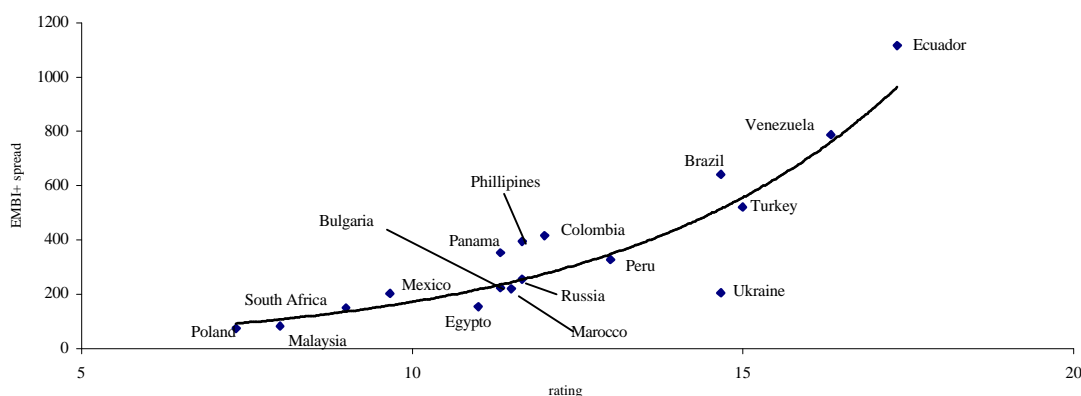
16. On 30 August, the EMBI+ comprised 28.5% *Brady Bonds*, 70.8% *Eurobonds* and 0.7% negotiable loans according to market value. The criteria for a debt bond to belong to EMBI+ are the following: a minimum value to expire of US\$ 500 million; risk rating equal or lower than BBB (S & P) and Baa 1 (Moody's) ; over one year to maturity; and the possibility of being compensated internationally through systems such as *Euroclear*.

The additional yield relative to US government bonds is awarded in order to compensate for the higher risk represented by the public debt securities of emerging countries. The higher the spread the higher the probability of default deduced by investors. Since when calculating sovereign spreads only bonds issued by central governments are taken into account, this is effectively an indicator of sovereign risk since its description as “country risk” is somewhat imprecise.

Bearing in mind that the EMBI+ spread and the ratings of the agencies are sovereign risk indicators, some relationship can be expected between the two. Graph 1 shows these two indicators for the countries which comprise the EMBI+, with the exception of Nigeria and Argentina. It can be seen that there is indeed a direct relationship, albeit imperfect, between the EMBI+ spread and the ratings. A notable exception is Ukraine which has the same average rating as Brazil, but the sovereign spread was three times lower on 19 September 2003.

All in all, “speculative grade” governments generally have to pay higher costs for obtaining finance in the international market than “investment grade” governments. This has direct repercussions on the external financing costs of the private sector of such countries, since both the spread and the sovereign rating are key parameters for determining the costs involved in external borrowing by residents of a given country.

**Graph I: EMBI+ Spread and Risk Classification**  
(19 September de 2003)



Sources: J.P.Morgan, Moody's, S&P and Fitch.  
Notes: 1. Average of risks according to numerical scale described in Table I  
2. Rating above 10 speculative grade; below investment grade.  
3. Marocco is not rated by Fitch.

One of the reasons for possible discrepancies between market risk assessments and those produced by the rating agencies is that the spread is subtracted from the prices of assets, which are subject to supply and demand pressures, which are additionally influenced by a range of factors extending beyond those concerned exclusively with risk perception.

As we have observed, factors which can influence in this context include the misgivings of investors regarding the quality of the information presented and the more general parameters of the calculation, the degree of investor risk aversion, liquidity arising from the monetary policies of developed economies and other short term factors.<sup>17</sup> By contrast to the more stable and long term outlook which the ratings seek to establish, the market price indices are sensitive to short term changes in economic climate, which cause them to fluctuate across-the-board or in relation to a specific country.

With the exception of discrepancies noted over short periods of time, existing studies nevertheless point to relative convergence between the risk premia indices in the markets and the agency ratings when the averages over long periods are used as reference benchmarks. Variations of a general nature such as for example an overall surge in risk aversion, a drop in confidence or a reduction of available liquidity, tend to drive up and turn steeper the curve shown in Graph 1 without however undermining the increasing scale of premia according to the ratings.

Over the long term, the volatility exhibited by the risk premia of “speculative grade” economies turns out to be swifter than the equivalent in the “investment grade” - a factor that accentuates the steepness of the curve. The economies on the more speculative point present higher sensitivity eg: in respect of interest rate changes in the developed economies.

Doubts are often expressed regarding the nature of the correlation and the direction of causality between classes of risk and risk premia in the market. Do the ratings delimit and stabilize the direction taken by the volatile markets or do the ratings follow trends which turn out to be systematically shown by the markets - ie: rating modifications in the wake of change in the perception of risk by the market itself? Markets move more rapidly, and when they show that they are moving sustainedly in a certain direction on a particular asset this direction is frequently accelerated as a result of the announcements of changes in the assets ratings, suggesting that the rating agencies’ assessments exhibit a marked pro-cyclicality.

A study carried out by the Secretariat for International Affairs of the Ministry of Finance on Brazil, Mexico and Argentina covering the period from 1994 to January 2001, concluded that in the majority of the floating periods the risk rating agencies demonstrated independence with regard to sovereign spread swings. Cases do exist where agencies followed the market, cases where they did not and still others where both were caught offguard by sudden changes in the economic and financial situation of a country (SAIN, 2001). Reisen and von Maltzan (1999, quoted in IMF, 2000) conducted an empirical study covering 29 countries from 1980 to 1997 which sought to verify the existence of causality between the variations in the sovereign spread and those in the ratings. The authors concluded that the sovereign spreads preceded the ratings in the Granger sense and vice-versa. In other words, the ratings can be seen to lagging behind the market and the market to be lagging the ratings.

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17. This problem is accentuated for more liquid assets such as the case of Brazilian *C-bonds*. The high liquidity of these, in addition to the Brazilian Government’s “Speculative Grade” rating, makes the bonds natural candidates for sale at times of instability in the emerging economies bond markets.

The results of these studies reflect the practices of the agencies, described in the following chapter, and of investors. As seen above, investors take buy and sell decisions based on ratings and on the existence of self-regulatory or governmental rules. It follows that if a sovereign debtor is upgraded or downgraded, the prices of its bonds will move in parallel with the increased or decreased bond offers.

We shall see in Chapter 3 that in normal situations perception of market risk as reflected in sovereign spreads is not part of the process of risk assessment. Nevertheless, in times of instability the agencies do in fact incorporate it into their analyses. The reason for this is that a significant rise in the spread can by itself lead to suspension of debt service on account of the restrictions that it places on access to the financial market. The ratings in principle should be stable, based upon the medium-to-long term fundamentals of the creditor. Investors expect these qualities to be preserved, arguing that the use of a volatile indicator such as sovereign spread in the rating can have a pro-cyclical effect during crises of confidence and contribute to a deterioration of the situation. (Moody's , 2002a)<sup>18</sup>.

One further hypothesis to be considered is whether underlying factors exist which are common to both the ratings and to the risk premium trends in the markets - with the apparent pro-cyclical behavior of the former merely exhibiting slower reactions by comparison with the immediatism of the latter. In this sense, even when market movements are assimilated into the decisions of the agencies and the ratings add momentum to the direction taken by the market, the appraisal of both in the final instance would fall into this third group of factors.

The hypothesis of a *tertius* - in other words of the existence of determinants which antecede and explain the tandem movement of ratings and premia - will be examined in the next Chapter, focusing on the risk rating processes used by the agencies. It will be noted that the agencies take into consideration a basic group of macroeconomic variables, which we shall address later, in Chapter 4.

### **3. The Sovereign Risk Rating Process**

Sovereign risk assessment needs to take account of a government's capacity to repay debt and primarily its willingness to pay.<sup>19</sup> These requirements inevitably introduce a degree of subjectivity into the analysis, rendering it more complex and difficult than risk assessment applied to companies alone. Reduced willingness to pay can arise from the lack of a well-defined mechanism to guarantee compliance with the terms agreed at the time the debt was contracted. No supranational entity exists e.g. one which is capable of resolving in a reasonable timespan disputes between government and creditors. Meanwhile, creditors find it extremely difficult to impose direct sanctions in cases of default, in line with the principle of international law regarding the immunity of sovereign states, according to which the physical or financial property of governments is

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18. Fitch analysts, in the course of a meeting in the Secretariat for Foreign Affairs in the Brazilian Ministry of Finance in May 2003, admitted that the agency used indicators of market risk perception in their ratings evaluation process at times of instability.

19. Extensive theoretical literature exists about sovereign risk. For an guide to this up to 1986, see Eaton, Gersovitz and Stiglitz (1986) and for a more recent outline, see Araújo (2002).

not subject to the jurisdiction of a second foreign government.<sup>20</sup> One further point: government decisions take into consideration not only economic and financial factors but also social and political circumstances. The latter can exert a decisive influence on a sovereign government's willingness to pay.

The most effective sanction that creditors can impose is to put the international credit market out of bounds for defaulting governments and to demand a higher risk premium (higher rate of interest) when the defaulters return to foreign borrowing. Partly for this reason, the majority of sovereign default events are partial rather than total moratoria. Governments in difficulties customarily establish a hierarchy among their creditors, above all avoiding defaulting with the multilateral credit institutions. A government can remain in default for a lengthy period, but sooner or later it needs to return to the foreign capital market and negotiate some type of agreement with its creditors on pending credits.

Research conducted by the IMF shows that ratings are not the result of a specific statistical model to determine quantitatively the probability of a default (IMF, 1999) - the subjective element in an evaluation of willingness to pay renders such models less efficacious for assessment of sovereign risk. Rating is the result of interdisciplinary work which combines analysis employing quantitative methods together with a discretionary approach by analysts with respect to qualitative parameters (Moody's, 2003). Substantial emphasis is placed on both aspects.

The rating process normally comprises three stages (i) assessment of the economic situation (ii) quantification of the factors assessed, including qualitative ones, through the use of a "points system" and (iii) a decision on the rating decided by a vote in committee based on analysis of the data emerging from (i) and (ii).<sup>21</sup>

Analysis of the overall economic situation generally commences with a visit of at least two analysts to the country being assessed. This is devoted to meetings with key government officials, analysts from the private sector, journalists, university researchers and members of the political opposition. The meetings with government officials provide among other things an opportunity to call for more detailed information on official figures - vital for getting a better understanding of the management of fiscal and monetary policies. The agencies give much importance to clarity and consistency of these policies since experience shows that the way in which they are administered has a marked influence over the balance of payments and sustainability of the public debt.

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20. More recently, the principle of restricted sovereign immunity has prevailed. This limits sovereign immunity to activities which are typically those related to the state, such as embassies and consulates, and does not apply to acts of management - those activities which, in other words, could be carried out by the private sector. Nevertheless, this distinction has had little practical effect to date. Cases where creditors secure favorable decisions related to sequestering of state assets in the case of an unpaid debt are rare. On the other hand, the value of sequestered assets of governments abroad is, in the majority of cases, significantly lower than the total amount owed. This issue is more complicated and controversial than described briefly here and falls outside the scope of the present paper. For a résumé of this topic in the US and United Kingdom, see Obsfeld and Rogoff (1996). For a discussion on the outlook in terms of Brazilian law see Azevedo and Júnior (2001).

21. Details on the rating process were obtained from Bhatia (2002) and the IMF (1999), supplemented by texts from the agencies themselves (Fitch, 1998, Standard & Poor's, 1998 and 2002b and, finally, Moody's, 1999, 1999a, 1999b, 2002a, 2002b, and 2003b).



Contacts with the other sectors serve to counterbalance the official view. Following the visit, a report is drawn up and distributed in advance to members of the committee. This will contain *inter alia* tables with macroeconomic data, forecasts and the rating recommendation.

The committee is the cornerstone of the rating process. Meanwhile, the “points system” is the basis of the committee meetings, serving as a guide for the discussions and the final establishment of ratings. Each parameter is discussed and assessed openly by the committee members with points subsequently awarded by vote. A key feature in the discussions is a comparative exercise between countries with similar ratings, regardless of region of origin, aimed at avoiding inconsistencies between ratings. For this reason, the composition of the committee is relatively heterogeneous, with analysts from the pertinent private sectors and specialists in the sovereign debt of different regions and with different ratings, in addition to experts on the country under scrutiny.

The S & P points model contains 10 categories and the Fitch model 14.<sup>22</sup> Both can be consolidated into five general categories: political, civil and institutional risk; the real sector; the monetary and financial sector; the external sector and, finally, the fiscal sector (see Chart 1 below). In S & P’s case each category is given a mark between 1 (best) and 6 (worst). The values of the categories are weighted and added together in order to obtain a total marking. Assessment of qualitative factors such as e.g. the probability of a *coup d’etat* are based upon the subjective experience and expertise of the committee members. Levels corresponding to each mark are established for the quantifiable variables. Appraisal of the categories is not ring-fenced, since political and institutional factors influence the dynamic of the remaining sectors and vice-versa.

Given that the ratings are opinions regarding the future probability of default, the various macroeconomic indicators forecasts carry significant weight in the points model. In S & P the principal macroeconomic forecasts considered are: nominal GDP *per capita* (in dollars), real GDP *per capita* growth, the nominal central government result/GDP ratio<sup>23</sup>, general net or consolidated debt/GDP, gross expenditure on interest/gross receipts, inflation measured by consumer price index, net external debt of the public sector/ balance of payments current account receipts, and net external debt of the non-financial private sector/ balance of payments current account receipts (Bhatia, 2002).

In order to construct forecasts for the real and monetary sectors, the mid-term IMF scenarios and those of the *Consensus Forecast* (Consensus Economics) are widely used. The agencies place great importance on forecasts for total internal and external public debt - the final result of the debt sustainability exercises. The basic scenario for sustainability simulations is constructed taking into account the subjective assessments of expert analysts and scrutinized by members of the committee - not a broad econometric macroeconomic forecasting model. The assumptions employed are more conservative

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22. At the time of going to press, information on the Moody’s “points model” was not available. The agencies publish from time to time statistical *compendiae* covering historical series and forecasts of a range of economic indicators. The group of variables in these publications as well as in the country reports is fairly similar. This induces us to believe that the discussions of the committees of the three agencies are based upon a relatively homogeneous group of variables and parameters.

23. The definition of “central government” means the federal government or central administration plus the local/state governments. It does not include state-owned financial and non-financial enterprises.

variations of the official forecasts or those of the IMF, on the basis of which alternative scenarios are constructed (Bhatia, 2002). Occasionally the agencies, either openly or in private, upgrade a given rating conditional on the passing of reforms to improve long term public indebtedness profiles. This was the case with S&P in 2001 when it decided to raise Mexico's rating from BB+ to BBB following approval of the tax reform. Mexico was awarded an "investment grade" rating.

While incorporating forecasts, the results of the points system have a retrospective bias. Moreover they may not reflect less tangible considerations which could have a bearing on the risk of default, such as social, historical and political factors. The committee may conclude that the rating indicated by the model is not appropriate in the light of, for example, monetary policy management - which in turn might be influenced by a number of different factors such as the ideological shape of a given government, tight fiscal and monetary policies, social pressures, the government's popularity and its Congressional support base. Committee members assess how the authorities have managed economic problems in the past, how potential stress situations will be administered in the future and whether instruments are available for dealing with these. Other key aspects of this assessment include the history of public debt default, the relationship between the government and the IMF and other multilateral credit institutions, the institutional architecture (eg: the existence or not of an independent Central Bank) and the government's capacity to secure the necessary political support to manage future crises. To balance the process of sovereign risk assessment, the committee also invites the opinions of independent political analysts, experts from the banking sector and private consultancy firms and those from other risk rating agencies.

After due consideration of all these points, the rating is decided by a vote. A report incorporating the majority view of the committee is then drawn up and circulated. This contains an explanation of the main factors underpinning the rating awarded and indicating the principal concerns of the agency : why the rating is high or low, factors that could occasion an upgrade or downgrade in the rating and the prospects for the rating in different scenarios (Moody's, 2002a). A selection of macroeconomic indicators and forecasts looking ahead for a maximum of two years is also appended to the reports.

Once a rating has been established, it is periodically reviewed. The review procedures are essentially the same as those undertaken during the first rating exercise. Review visits are carried out every 6 or 24 months, depending on the country involved. In normal circumstances the abovementioned committees are convened a few weeks after the visits. When a relevant unexpected fact arises, the chief analyst responsible for the particular sovereign debtor can convene an ad hoc meeting of the committee which is not preceded by the customary stages of the process. The outcome of the discussions may (or may not) lead to a change in the rating prospect, the placing of a sovereign risk on the Watch List or to a reappraisal in the rating itself.

#### **4. Macroeconomic Determinants of Sovereign Risk Rating**

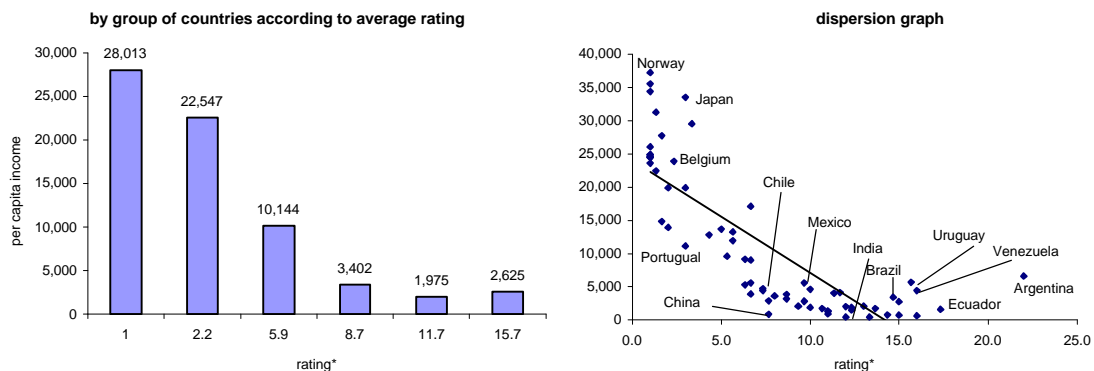
The agencies do not divulge the weightings attributed on the basis of the factors which they examine in the course of determining their ratings. However, they do disclose in articles on the methodology employed in risk rating and in their own published country reports what the most important variables are (see Chart 1).

While the agencies emphasize the prospective nature of the ratings, the latter are nevertheless conditioned predominantly by retrospective factors: however positive the trend of a given economy might be, the fundamental health of that economy continues to exert a major influence over a given government's capacity and willingness to pay.

In this Chapter, we try to show how a number of the variables employed by the agencies behave individually with respect to risk rating. Finally, we shall examine the hypothesis that, taken as a whole, such indicators provide good antecedents for the ratings and point the way to the value of risk premia in the markets. The previous chapter describing the actual processes of risk assessment highlighted the fact that these parameters were examined in parallel with other factors.

Governments of high *per capita* income countries typically possess a low risk assessment (see Graph II). *Per capita* income for example is normally regarded as a good indicator of the general level of economic and institutional development of a particular country. Rich country governments have greater flexibility to adopt tight policies in adverse periods (Fitch, 1998 and Bhatia, 2002). Moody's (2003.b) asserts that the relevance of a given range of variables varies according to the level of a country's development. The authorities in developed countries with a long history of economic and institutional stability possess better instruments for managing public debts, high fiscal deficits and unexpected economic shocks.

**Graph II: Per Capita Income**  
(Current US\$; average 1998 to 2002)



Sources: Moody's, S&P and Fitch.  
\*Average ratings on 31/12/2002 for sample of 66 countries as described in Table III.

All countries with a *per capita* income of under US\$5,000 in 2002 belong to the "speculative grade" category. However, sovereign bonds of low income countries are not always considered to be risky investments. One example is China, a country where *per capita* income is under US\$1,000 but which is assessed as "investment grade" (Table III). China enjoys among other things a low gross central government debt/GDP ratio, a low total net external debt, inflation is under control and the country has a track record of high economic growth.

**Table III: Sovereign Rating by Country and Agency**  
(on 31/12/2002)

	Fitch		S&P		Moody's		Average of numerical scales
	Rating	Equivalent numerical scale	Rating	Equivalent numerical scale	Rating	Equivalent numerical scale	
<b>1</b>							<b>1.0</b>
Austria	AAA	1	AAA	1	Aaa	1	1.0
Finland	AAA	1	AAA	1	Aaa	1	1.0
France	AAA	1	AAA	1	Aaa	1	1.0
Germany	AAA	1	AAA	1	Aaa	1	1.0
Ireland	AAA	1	AAA	1	Aaa	1	1.0
Holland	AAA	1	AAA	1	Aaa	1	1.0
Norway	AAA	1	AAA	1	Aaa	1	1.0
Switzerland	AAA	1	AAA	1	Aaa	1	1.0
United Kingdom	AAA	1	AAA	1	Aaa	1	1.0
USA	AAA	1	AAA	1	Aaa	1	1.0
<b>1-4</b>							<b>2.2</b>
Australia	AA	3	AA+	2	Aaa	1	2.0
Canada	AA+	2	AAA	1	Aaa	1	1.3
Denmark	AA+	2	AAA	1	Aaa	1	1.3
Spain	AA+	2	AA+	2	Aaa	1	1.7
Sweden	AA+	2	AA+	2	Aaa	1	1.7
Belgium	AA	3	AA+	2	Aa1	2	2.3
New Zealand	AA	3	AA+	2	Aaa	1	2.0
Italy	AA	3	AA	3	Aa2	3	3.0
Japan	AA	3	AA-	4	Aa1	2	3.0
Portugal	AA	3	AA	3	Aa2	3	3.0
Iceland	AA-	4	A+	5	Aaa	1	3.3
<b>4-7</b>							<b>5.9</b>
Taiwan	A+	5	AA-	4	Aa3	4	4.3
Slovenia	A	6	A	6	Aa3	4	5.3
Kuwait	AA-	4	A+	5	A2	6	5.0
Greece	A	6	A	6	A1	5	5.7
Cyprus	A+	5	A	6	A2	6	5.7
Estonia	A-	7	A-	7	A2	6	6.7
Hungary	A-	7	A-	7	A1	5	6.3
Malta	A	6	A	6	A3	7	6.3
Korea	A	6	A-	7	A3	7	6.7
Israel	A-	7	A-	7	A2	6	6.7
Czech Republic	BBB+	8	A-	7	A1	5	6.7
<b>7-10</b>							<b>8.7</b>
Chile	A-	7	A-	7	Baa1	8	7.3
Poland	BBB+	8	BBB+	8	A2	6	7.3
China	A-	7	BBB	9	A3	7	7.7
Lethonia	BBB	9	BBB+	8	A2	6	7.7
Malaysia	BBB+	8	BBB+	8	Baa1	8	8.0
Lithuania	BBB	9	BBB	9	Baa1	8	8.7
Slovakia	BBB-	10	BBB	9	A3	7	8.7
Tunisia	BBB	9	BBB	9	Baa3	10	9.3
South Africa	BBB-	10	BBB-	10	Baa2	9	9.7
Mexico	BBB-	10	BBB-	10	Baa2	9	9.7
Croatia	BBB-	10	BBB-	10	Baa3	10	10.0
Thailand	BBB-	10	BBB-	10	Baa3	10	10.0
<b>10-13</b>							<b>11.7</b>
El Salvador	BB+	11	BB+	11	Baa3	10	10.7
Egypt	BB+	11	BB+	11	Ba1	11	11.0
Kazakstan	BB+	11	BB	12	Baa3	10	11.0
Panama	BB+	11	BB	12	Ba1	11	11.3
Philippines	BB+	11	BB+	11	Ba1	11	11.0
Costa Rica	BB	12	BB	12	Ba1	11	11.7
India	BB	12	BB	12	Ba2	12	12.0
Russia	BB-	13	BB	12	Ba2	12	12.3
Colombia	BB	12	BB	12	Ba2	12	12.0
Bulgaria	BB	12	BB+	11	B1	14	12.3
Peru	BB-	13	BB-	13	Ba3	13	13.0
<b>13-22</b>							<b>15.7</b>
Romania	BB-	13	B+	14	B1	14	13.7
Vietnam	BB-	13	BB-	13	B1	14	13.3
Papua New Guinea	B+	14	B	15	B1	14	14.3
Brazil	B	15	B+	14	B2	15	14.7
Ukraine	B	15	B	15	B2	15	15.0
Turkey	B	15	B-	16	B1	14	15.0
Indonesia	B	15	CCC+	17	B3	16	16.0
Venezuela	B	15	CCC+	17	B3	16	16.0
Ecuador	CCC+	17	CCC+	17	Caa2	18	17.3
Uruguay	B	15	B-	16	B3	16	15.7
Argentina	DDD	22	SD	22	Ca	22	22.0

Sources: Moody's, S&P and Fitch.

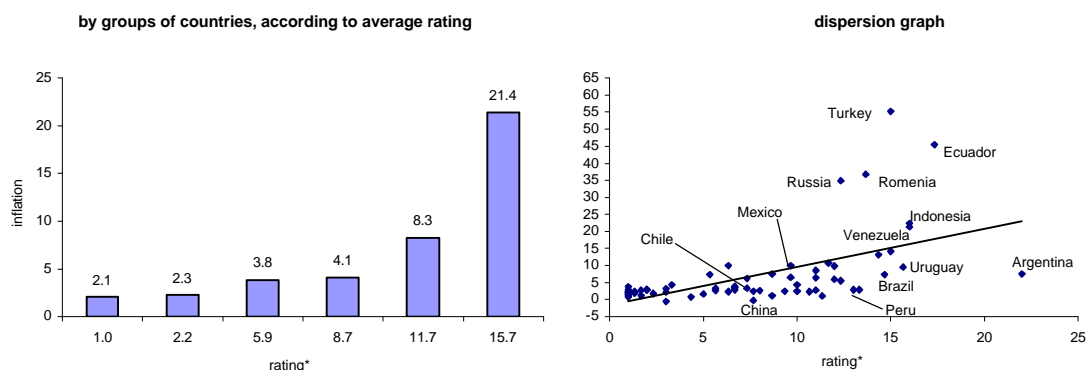
On the other hand, India - which like China is a low income country with a dynamic economy, a large population and a large land area - is nevertheless considered to be a fairly high risk debtor (Table III). Among other reasons, risk assessment of the Indian government is affected by low GDP per capita, the high fiscal deficit of the central government (10.7% of GDP in 2002), a high gross public debt/GDP ratio (77% of GDP in 2002) and by the fact that the country is closed to international trade, with high import tariffs and exports representing only a small share of GDP.

Inflation rates are considered by the agencies as one of the best barometers of the consistency of fiscal and monetary policies and of financial, political and institutional stability of a given country. Substantial and prolonged financing of budget deficits through capital issues invariably causes a quickening of inflation or even a surge of hyper-inflation. In these circumstances, the authorities generally adopt unpopular policies aimed at monetary squeeze and expenditure containment - which are more efficiently implemented where there is an autonomous Central Bank and where the authorities enjoy a broad, cohesive political support base. Failing this, the inflationary process can gather speed leading to loss of credibility of the government and its institutions. This kind of situation is generally followed by suspension of public debt servicing (S&P, 2002).

Graph III shows that the average rate of inflation over the last five years of “investment grade” countries (BBB/Baa or above, or under 10 on the numerical scale) is substantially lower than that in “speculative grade” countries. It can also be observed that there is not one single country in the first category in which the average inflation rate over the last five years has exceeded 10%. On the other hand, the highest rates of inflation can be seen in those countries rated as “speculative grade”. However, cases exist in which consumer price variations reminiscent of those of developed countries can be seen, such as in the case of Peru (3%). In that country, the low inflation rate reflects the fact that a series of structural reforms was implemented in the 1990’s. Also fiscal and monetary policies were managed conservatively. Nevertheless, Peru’s risk rating was negatively affected by political uncertainty, by a high level of external indebtedness relative to current account receipts (260% in 2002) and by a low level of diversification on the export front which is still highly concentrated on raw materials.

While Ecuador and Turkey presented the highest average consumer price variations on this list - 45.4% and 55.1% respectively - only the first went into default (in 1998) following a banking, exchange and political crisis, leading to dollarisation of the economy. Turkey faces institutional and political problems but in view of its strategic geographical position benefits from the firm financial backing of the IMF.

**Graph III: Inflation (Consumer Price Index)**  
 (% variation over 12 months; average from 1998 - 2002)



Sources: Moody's, S&P and Fitch.  
 \*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

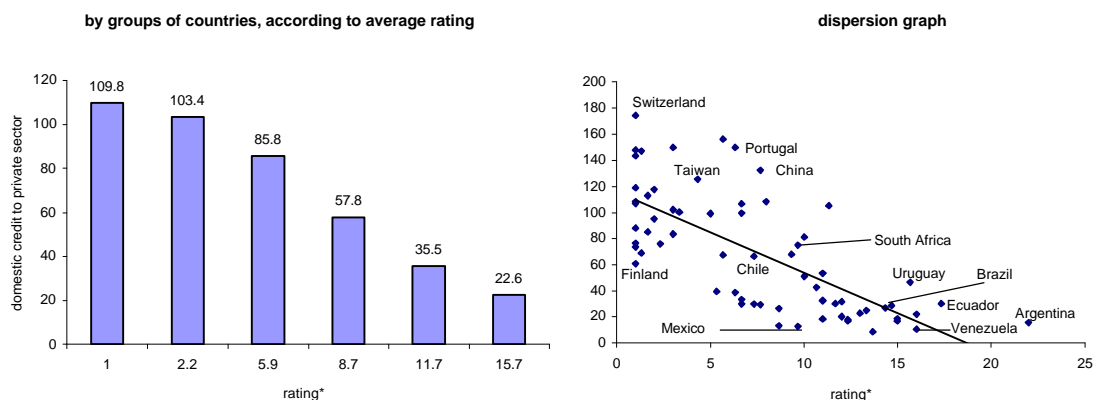
One other factor related to the monetary sector that the agencies judge to be important in their assessments is the degree of maturity exhibited by the financial markets. In countries where the financial system is well-developed and in which government bonds are purchased by a broad sector of the population, the costs incurred in a default are higher. This contrasts with countries where the use of the banking system is limited and where government creditors form only a small group of the country's financial agents (S&P, 2002).<sup>24</sup>

One of the indicators of the level of financial development is domestic credit available for the private sector as a proportion of GDP. In Graph IV, it can be seen that in general the sovereign issuers of countries where this variable is high tend to receive better ratings. As with other variables, several important exceptions can be found within each category. Mexico for example possesses one of the lowest private sector credit/GDP ratios (12.5% in 2002), but the Mexican government is nevertheless "investment grade".

Moody's points out that Mexico benefits from increasing economic, commercial and financial integration with the US economy. This agency maintains that since the NAFTA (*North American Free Trade Agreement*) was put in place in 1993 the Mexican economy has become more resistant to both domestic and external shocks and less vulnerable to contagion by financial crises experienced by other emerging economies (Moody's, 2003c.) A further point is that the majority of large firms installed in Mexico, including a substantial number of multinationals, look to the American capital market for their borrowing requirements - which effectively reduces the relevance of domestic credit for the private sector as an indicator of financial health.

24. This consideration is more pertinent to the risk involved in bonds in local currency, but it has important effects on ratings of obligations in foreign currency. The credibility of a defaulting government on its domestic debt is much less pronounced than that of a government that honors all its payments.

**Graph IV: Private Sector Credit  
(% of GDP; 2002)**



Sources: Moody's, S&P and Fitch.

\*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

The extent of trade and financial openness of a given country *vis-à-vis* the rest of the world is another key factor taken into account in the ratings process. This has a direct bearing on sovereign debtors' willingness to pay. The economic and financial costs of a default for a country are judged to be directly proportionate to the level of its integration with the rest of the world (S & P, 1998), which in turn reflects the extensive use that the private sector of an open economy makes of the international financial market to finance investments, exports and imports.

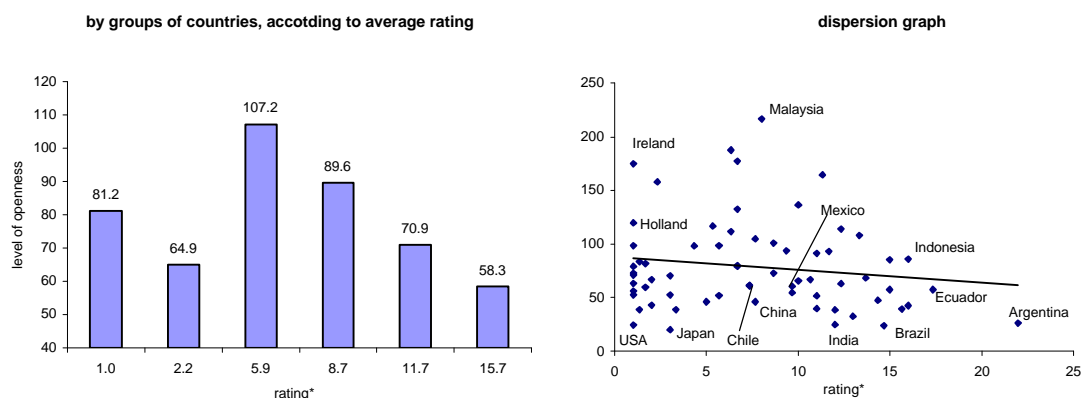
A further reason why trade/financial openness is important in rating assessments was put forward by Fitch (1998) which claimed that in countries with policies favoring openness industries tend to be more competitive and in tune with the external market, while in protectionist countries industries have a tendency to be inefficient, focusing exclusively on the local domestic market and undermining the generation of foreign currency - thereby reducing capacity to service foreign debts. Furthermore, countries with a high foreign trade content in the GDP generally require lower devaluations to effect adjustments in the balance of payments when confronting external shocks, compared with those countries where the share of foreign trade in the economy is less prominent.

Graph V shows the levels of commercial opening (sum of exports plus imports of goods and services measured as a percentage of GDP) on the vertical line and sovereign ratings on the horizontal. It can be seen that an inverse ratio exists between these two variables for "A" rated (or lower) sovereigns.

The latter cannot be observed in the case of the higher ratings ascribed to the developed countries. The foreign trade/GDP ratio has the advantage of being a simple indicator of commercial opening but it tends to be lower in "large" economies such as the US, Japan, Brazil, Mexico, India and China. This occurs because the numerator (exports plus imports of goods and services) is measured in dollars, while the denominator (GDP) embraces a broad spectrum of non-tradeable goods whose weighting can be underestimated in national accounting. Moreover, this variable can be overestimated in those countries where the export sector is heavily dependent on imported inputs such as in Mexico and China.

Notwithstanding these problems, the agencies consider that this variable is still a good indicator of the level of integration with the world economy (Moody's , 2003b).

**Graph V: Level of Commercial Openness**  
(exports + imports of goods and services as % of GDP; average of 1998 - 2002)



Sources: Moody's, S&P and Fitch.  
\*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

The most important variable in any assessment of the external sector is total net external debt (gross external debt minus assets in foreign currency) in relation to current account receipts and not to GDP - a more traditional method.<sup>25</sup> The reason for assessing public external debt together with private external debt resides in the fact that the latter can exert pressure on the international reserves of the Central Bank. In certain circumstances, private external liabilities can be transformed into governmental liabilities (S & P, 2002). Governments receive a lower rating in countries where the banking sector promotes domestic credit expansion through foreign borrowing or where exchange policy and the level of the real exchange rate are an incentive to excessive growth of the external indebtedness of the non-financial private sector (Bhatia, 2002).

In overall terms, the larger the total external debt of a given country in relation to its capacity to generate foreign currency, the more onerous the servicing of this debt tends to become and the greater the risk of default by the sovereign issuer. This does not always occur. Other factors exist, considered together with the debt stock, which increase the cost and affect capacity to service the external debt eg: the level of international reserves and the ratio of external debt/current account receipts.

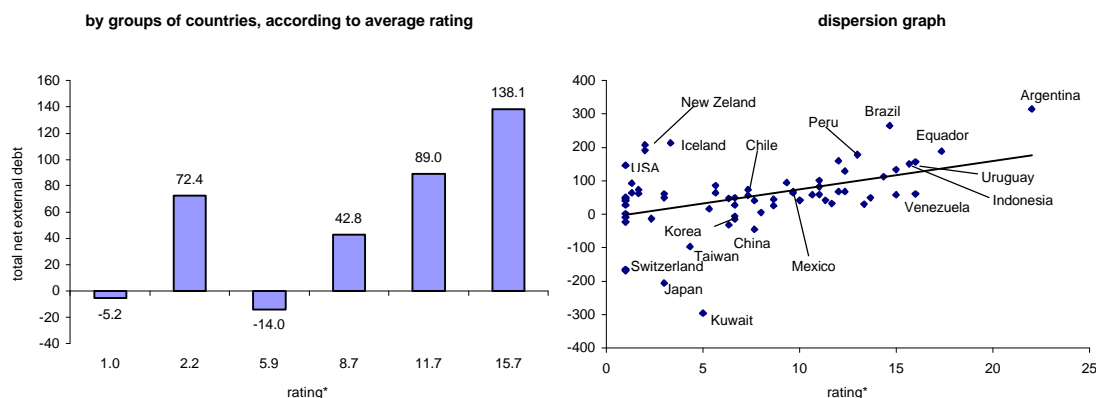
In Graph VI below it can be seen that on average in the countries with sovereign bonds in the "investment grade" category the ratio between total net external debt /current account receipts is less than in countries in the "speculative grade" category. But pronounced differences can also be observed between the AAA/Aaa and AA/Aa rated countries. Within these ratings there are examples of countries with negative net external debt as well as countries with net external debts equivalent to those in countries rated as "speculative grade".

25. Receipts in current account: exports of factor and non-factor goods and services plus unilateral transfers.



The state of the foreign indebtedness of the United States, Australia and New Zealand is noteworthy - among the highest recorded debts in the sample, equivalent to countries in the B and C rating bands. Ability to manage developed economies with a good reputation for fulfilling external obligations - and in the case of the United States, with almost the entire public and private external debt being denominated in US currency - confers a high rating on these governments. At the other end of the spectrum is Venezuela, which has one of the lowest levels of external indebtedness but which nevertheless falls into the “speculative grade” as a country. A longstanding track record of economic and political instability over the past two decades has caused the government to be awarded one of the worst ratings in the sample. The restricted access to the financial market by the Venezuelan authorities on account of this is effectively limiting the growth of its external debt.

**Graph VI: Total Net External Debt / Current Account Receipts (%)**  
(%)



Sources: Moody's, S&P and Fitch.  
\*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

In the analysis of public finances two variables are crucial: the nominal deficit of the central government in proportion to the GDP and the government's stock of debt relative to its total receipts.<sup>26</sup> The reason for preferring this latter indicator is that in certain countries a low public debt/GDP ratio can occur while at the same time presenting serious indebtedness problems on account of the government's low tax collection capacity.

This is the case of Turkey, India and Peru (Moody's, 2003b). In 2002, the gross public debt of Peru amounted to approximately 47% of GDP, very close to the Latin American average. However, when receipts were taken into account, Peru's public debt in fact stood at 270% - one of the highest in the whole region.

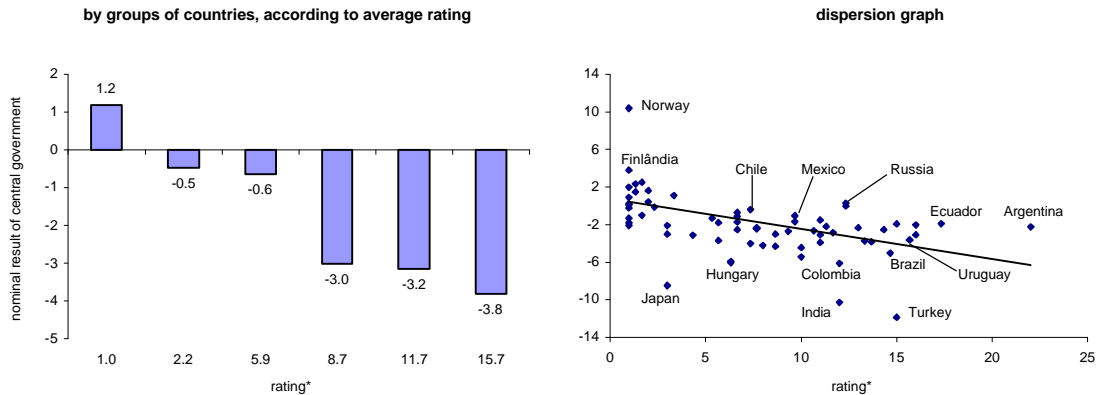
26. The agencies pay great attention to analysis of the development of net public debt stock. However due to difficulties in obtaining this information for all the countries in the sample, we chose to evaluate in the present paper the relationship between sovereign rating and gross public debt.

It can be reckoned that a government considered to be a high risk will have returned high nominal deficits over the past years and that its debt stock will be substantially larger than that of low-risk governments. In Graphs VI and VII, we can see that on average the nominal deficit increases as the risk rating declines. In the case of public indebtedness this ratio is not totally clear but in general terms “investment grade” sovereign debtors possess a lower debt stock than those in the “speculative grade” category.

Other factors taken into account are the sensitivity of the public debt to changes in interest rates, the currency it is expressed in, the average maturity period and the cost of debt servicing. The agencies also watch out for the capacity of a given government to increase tax receipts and to trim expenditure whenever necessary. Countries with a limited tax base or with a substantial part of their costs linked to specific expenditure find it difficult to introduce fiscal adjustment when needed. Japan and Italy present a public sector indebtedness level approaching that of “speculative grade” countries.

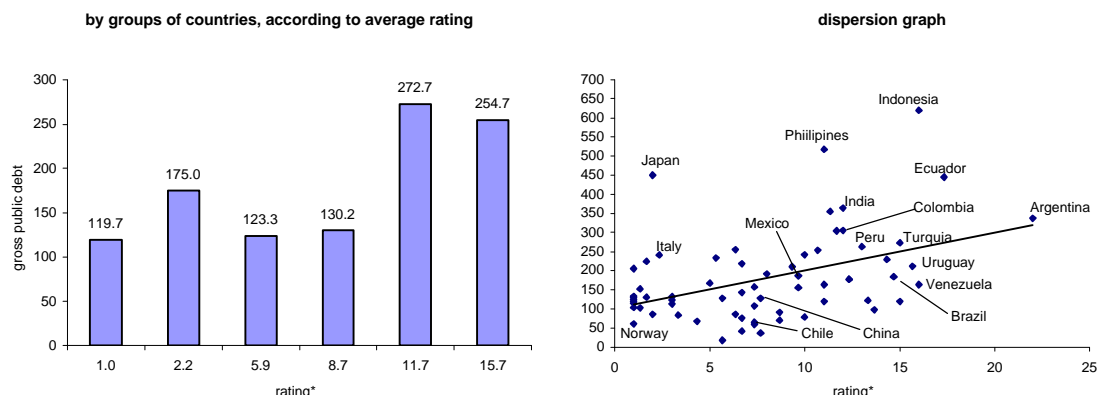
Nevertheless, the cost involved in rolling over their debts is low since the majority of the debt is denominated in local currency and the maturity dates are long term. In addition, as pointed out at the beginning of the present Chapter, the agencies know that the authorities of developed countries have access to better instruments to manage high public debts and fiscal deficits and are better placed to deal with unexpected economic shocks.

**Graph VII: Nominal Result of Central Government / GDP (%)**



Sources: Moody's, S&P and Fitch.  
 \*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

**Graph VIII: Central Government Gross Debt / Total Receipts (%)**



Sources: Moody's, S&P and Fitch.  
 \*Average rating on 31/12/2002 for sample of 66 countries as described in Table III.

It is possible therefore to observe a direct relationship between sovereign risk ratings and certain macroeconomic variables. This relationship is not in general faultless and there are numerous exceptions. This can be expected since the macroeconomic variables are viewed as a whole in the assessment process. We shall attempt to identify, with the aid of an econometric model, whether a group of indicators can be used as a predictor .

A frequently-quoted pioneering study is that of Cantor and Parker (1996) which shows that the differences between the sovereign ratings can be explained on the basis of a relatively small group of variables. A higher rating would be associated with high *per capita* income in dollars, low inflation (measured by consumer price indices), a high level of economic growth, a low ratio between total external debt and exports, the absence of a default history since 1970 and a high level of economic development according to IMF classification. On the other hand, the fiscal results of central government and the current account deficit in proportion to the GDP appear as statistically insignificant.

The sample used by Cantor and Parker covered 49 countries. The dependent variable was the average of Standard and Poor's and Moody's ratings in September 1995 converted to a numerical scale of equivalence. The framework periods considered for the explanatory variables vary substantially: for real GDP growth the annual average for 1991 to 1994 was used; for inflation, current account deficit (in GDP %) and central government fiscal result (also in GDP %) the annual average 1992-1994 was employed; for *per capita* GDP and external debt as a proportion of exports of goods, the two agencies used the result recorded at the end of 1994. The economic development level was established in accordance with the classification of industrialized economies as at September 1995 (IMF). In order to quantify these factors and the default track records, a number of dummy variables were employed (1 = industrialised/0 = non-industrialised; 1 = defaulted at least one since 1970/0 = did not default since 1970).

In principle we can envisage a direct and systematic relationship between current account deficit and sovereign risk. However this is not strictly the case. Countries in default or facing severe restrictions on access to the international credit market are compelled to adjust their balance of payments, which implies generating large surpluses or effecting a drastic reduction in the current account deficit. This was the case of Argentina and other countries with low sovereign risk ratings such as Turkey and Uruguay.

Secondly, countries with a high level of economic growth tend to live with high current account deficits for a long period without this necessarily meaning that their risk of sovereign default is any higher. Among other things, it must be seen whether the increase in the deficit is financed through direct investments in the productive sector - which in the future should lead to increased export receipts or import reductions - or through forms of expanding external indebtedness which could become unsustainable in the medium term. Finally, there are those countries which have a structural tendency to generate surpluses on the current account, such as net exporters of oil. One example is Russia, which showed an average surplus on current account of 10% of GDP between 1998 and 2002.

Similar consideration can be given to the case of fiscal flows. In the event of eg: a highly indebted economy running high primary surpluses for a necessary period, the positive influence of these surpluses on the rating will arise via the reduction of the debt stock. Isolated momentary flows, for their part, are not sufficiently indicative to merit upgrading or downgrading of risk.

Based on the model proposed by Cantor and Parker, and having regard to the importance attributed to each variable by the rating agencies in their reports, we developed another version using a larger sample of countries (66 countries<sup>27</sup>), more recent data (from 1998 to 2002) and employing as the dependent variable the average of ratings awarded by all three agencies, as well as Fitch (instead of by only S & P's and Moody's). We substituted the explanatory variable current account deficit/GDP (used in Cantor and Parker's work) for the level of commercial opening (exports + imports of goods and services/GDP) and we included the variable gross central government debt / total fiscal receipts. In our estimations, we used panel data from 1998 to 2002 using the ordinary least squares method. In Table III a detailed description is given of the variables selected.

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<sup>27</sup> This is the same sample of countries used in Canuto and Santos (2003).

**Table III**  
**Description of Variables Used in Regressions**

<u>Variable</u>	<u>description</u>	<u>period</u>	<u>source</u>
Rating (dependent variable)	Long term ratings in foreign currency, converted to a numerical scale according to Table I.	31 December 2002	Moody's, S&P and Fitch
Inflation	Percentage variable over 12 months of consumer price index (end of period).	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Per capital GDP	In US\$ thousands.	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Real GDP growth	In %	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Nominal result of Central Govt	In percentage of GDP. Covers federal govt or central administration including the pensions/social security system, the central bank and local govts. Does not include financial and non-financial state firms.	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Gross debt of Central Govt	In percentage of Central Govt receipts. Covers federal govt or central administration including the pensions/social security system, central bank and local govts. Does not include financial and non-financial state firms.	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Level of openness	Exports + imports of goods and services in % of GDP	1998 – 2002 data.	Moody's, <i>Moody's Statistical Handbook</i> , April 2003.
Total net external debt	In percentage of the current account receipts of the balance of payments (exports of factor and nonfactor goods and services plus unilateral transfers). Gross external debt less gross assets abroad. In the case of emerging countries, the external gross assets include only cash deposits, international reserves including gold and government funds deposited abroad. Assets of the non-financial private sector abroad are not taken into account since they are generally the product of the capital flight and it is improbable that they would be repatriated during a crisis.	1998 – 2002 data.	Fitch, <i>Sovereign Data Comparator</i> , March 2003.
Development level	1 = developed economy; 0 = developing economy according to IMF definition.	August 2003	IMF, <i>International Financial Statistics</i> , August 2003.
Default	1 = the government suspended payments on interest or principal on the internal or external debt contracted on the basis of bond issues or bank loans at least once since 1975; 0 = the government never suspended payment of internal or external debt since 1975.	1975 - 2002	S&P, <i>Sovereign Defaults: Moving Higher Again in 2003?</i> , September 2002

Moreover, we tried to explain the dependent variable using three different models. In the first equation, we pooled together all cross section year data, generating thus a pooled cross section (PCS) model. We estimated this model in order to compare its results with the ones in Canuto and Santos (2003), which used cross section data and annual averages between 1998 and 2002 for each independent variable (except the *dummy* variables for development level and default). In this manner we can estimate how the dependent variable can be explained by the level of each explanatory variable.

Secondly, we estimated a fixed effects (FE) model, where the dependent and the independent variables (except for the *dummy* variables) were transformed by subtracting their values for each panel year from their means and then estimated<sup>28</sup>. One advantage of using a fixed-effects method is that it controls for omitted variables that are unobservable or difficult to measure<sup>29</sup>. Finally, we estimated a first differences (FD) model, where each independent variable was transformed by calculating the difference from the occurrence in one year from the previous year<sup>30</sup>. An advantage here is that (and the same happens in the FE model) we can estimate how the dependent variable can be explained by variations in the levels of each explanatory variable. Note that for the FE and FD models we eliminated from the regression all the time-invariant variables, such as development levels and default<sup>31</sup>. Finally, for each model we ran four regressions using as dependent variable the average ratings, Moody's rating, S & P's ratings and Fitch's ratings.

**Table IV**  
**Results of Regression Analysis, PCS model**

Explanatory variables	Variable dependent*			
	Average rating	Moody's	S&P	Fitch
Intercept	8,469733	8,649943	12,89111	11,66916
statistic-t	20,74640	20,00816	6,081150	6,079497
p value**	0,0000	0,0000	0,0000	0,0000
GDP per capita	-0,000139	-0,000130	-0,134295	-0,134083
statistic-t	-7,084807	-6,332944	-2,689963	-2,796211
p value **	0,0000	0,0000	0,0094	0,0071
Real GDP growth	-0,006751	-0,025104	-0,347230	-0,316643
statistic-t	-0,218002	-0,765555	-1,850170	-1,943515
p value **	0,8276	0,4445	0,0696	0,0570
Inflation	0,065908	0,059301	0,072819	0,059015
statistic-t	7,219622	6,136280	2,866802	2,503304
p value **	0,0000	0,0000	0,0058	0,0152
Central Govt nominal result	-0,014783	0,033084	-0,039093	-0,046372
statistic-t	2,016729	2,316154	-0,646943	-0,800004
p value **	0,5339	0,1829	0,5203	0,4271
Central Govt gross debt	0,006272	0,006019	0,006530	0,005197
statistic-t	7,626885	7,016091	2,805077	2,337887
p value **	0,0000	0,0000	0,0069	0,0230
Openness level (natural logarithm)	-0,711341	-0,090965	-0,913371	-0,652684
statistic-t	-2,320018	-2,047563	-2,558290	-1,970755
p value **	0,0011	0,0002	0,0133	0,0537
Total net external debt	0,007601	0,007456	0,007174	0,009422
statistic-t	6,504435	6,025559	1,970324	2,737190
p value **	0,0000	0,0000	0,0538	0,0083
Development level	-4,260534	-4,701455	-4,280330	-3,944248
statistic-t	-9,636861	-10,04210	-4,049303	-3,737016
p value **	0,0000	0,0000	0,0002	0,0004
Default	1,550288	1,566816	1,413743	1,533717
statistic-t	5,573166	5,318981	1,850998	2,169400
p value **	0,0000	0,0457	0,0694	0,0343
R <sup>2</sup> adjusted	0,877240	0,865609	0,872804	0,879611

**Notes:**  
Number of observations: 340.  
To solve the problem of heterocedasticity presented in the four regressions, we used the White procedure, which does not alter the value of the coefficients but renders the calibration deviations statistically consistent.  
\* The average ratings, each agency's ratings and the countries comprising the sample are listed in Canuto and Santos (2003).  
\*\*Exact level of significance, or minimum level of significance at which the null hypothesis can be rejected (Ho: coefficient = 0).

<sup>28</sup> Johnston and DiNardo (2001), p. 432.

<sup>29</sup> Johnston and DiNardo (2001), p. 428.

<sup>30</sup> Johnston and DiNardo (2001), p. 430.

<sup>31</sup> This methodology is widely used to estimate models using panel data (see, e.g., Cheng and Wall 1999).

In Table IV, we present the regression results for the PCS model. The regression is statistically significant and explains around 88% of the variation in the average rating. All the coefficients (but one, real GDP growth) are significant and possess the right signs with the exception of the coefficient of the central government deficit. The regressions with each agency's ratings as the dependent variable present similar results.

The observations already made about central government deficits explain why, insofar as the average rating is concerned, there appeared to be an inverse and systemic relationship between both. One possible explanation for the statistical insignificance of the variable is that a reduced fiscal deficit does not necessarily reflect a stable situation resulting from solid management of fiscal policy: it could simply be a reaction to an uncertain environment by the market, forcing the government to reduce its borrowing requirements.

A significant contribution to the  $R^2$  was observed following the joint inclusion of the "openness level" and "gross central government debt" variables. In other words, incorporation of the variables in the model increases the percentage of variation in the average rating explained by the independent variables. This contribution is more noteworthy in the case of S & P – which would suggest that this agency attributes a higher weighting to the "openness level" than the remaining agencies.

**Table V**  
**Results of Regression Analysis, FE Model**

Explanatory variables	Variable dependent*			
	Average rating	Moody's	S&P	Fitch
Interceptor	-0.055217	0.001956	-0,037688	-0,150278
statistic-t	-0.851603	0.046760	-0,385656	-1,585790
p value**	0,3951	0,9627	0,7000	0,1999
GDP per capita	-0.000197	-0.000191	-0,000249	-0,000130
statistic-t	-2.839968	-4.273166	-2,388934	-1,284559
p value **	0,0048	0,0000	0,0175	0,1999
Real GDP growth	0.014867	-0.007520	0,038049	0,030836
statistic-t	0.544218	-0.426658	0,0926478	0,776045
p value **	0,5867	0,6699	0,3549	0,4383
Inflation	-0.002789	0.017282	-0,003785	-0,005676
statistic-t	-0.264003	2.535251	-0,238234	-0,355587
p value **	0,7919	0,0117	0,8118	0,7224
Central Govt nominal result	-0.001918	0.023967	-0,002138	-0,032177
statistic-t	-0.067071	1.299252	-0,049710	-0,779164
p value **	0,9466	0,1948	0,9604	0,4365
Central Govt gross debt	0.006465	0.006073	0,001483	0,013679
statistic-t	3.623575	5.195812	0,544666	5,030779
p value **	0,0003	0,0000	0,5864	0,0000
Openness level (natural logarithm)	-0.010166	-0.013942	-0,002934	-0,015756
statistic-t	-1.009334	-2.145228	-0,193026	-1,078668
p value **	0,3136	0,0327	0,8471	0,2815
Total net external debt	0.004943	0.004626	0,008109	0,000908
statistic-t	1.977111	2.476032	1,861116	0,213025
p value **	0,0887	0,0138	0,0636	0,8314
R <sup>2</sup> adjusted	0,109941	0,271009	0,038731	0,109524
<b>Notes:</b>				
Number of observations: 340.				
To solve the problem of heterocedasticity presented in the four regressions, we used the White procedure, which does not alter the value of the coefficients but renders the calibration deviations statistically consistent.				
* The average ratings, each agency's ratings and the countries comprising the sample are listed in Canuto and Santos (2003).				
**Exact level of significance, or minimum level of significance at which the null hypothesis can be rejected (Ho: coefficient = 0).				

Finally, we note that these results for the PCS model confirms those ones obtained in Canuto and Santos (2003), that is, regardless if one uses cross section data and annual averages or pooled cross section panel data, the results that the dependent variable (ratings) can be explained by the level of each explanatory variable will remain.

In Table V, we present the regression results for the FE model. We note that the regression explains much less of the variation in the average rating, only around 11%. Moreover, only three coefficients (GDP per capita, government debt and external debt) are significant. They also possess the right signs. As in the PCS model, regressions with each agency's ratings as the dependent variable present similar results.

Then in Table VI the results are shown for the FD model. In this case, the explanatory power of the independent variables is again little, about 20%. Moreover, once again only three coefficients (real GDP growth, government debt and external debt) remain significant, and they also possess the right signs.

As far as the results for the FE and FD models are concerned, two effects are noteworthy. First, these models had a much smaller explanatory power when compared with the PCS model. This is probably due to the fact that we removed two (time-invariant) important explicatory variables (development level and default). Besides, we expect that ratings will not vary considerably with variations at the levels of the independent variables; that is, not much of the dependent variable is left to be explained by the variations in the levels of the chosen macroeconomic variables.

An exception is the debt variables (government gross debt and external debt). Note that these two variables are the only ones that remain significant in both the FE and FD models. This means that the levels of government and external debt, and the variations in these levels can partially explain difference in country's ratings.

We thus conclude from the three model estimations that there is indeed a strong correlation between a country's ratings (be it the average ratings or one of the agency's rating) and the level of the macroeconomic variables listed above, and between a country's ratings and the variation in levels of government debt and external debt. The FE and the FD models are not adequate to explain ratings here, since the time horizon of ratings changes are typically of a longer term, but the data used in this article covers a five year period only. In order to explain ratings in the long run it is necessary to consider a larger period of time.



**Table VI**  
**Results of Regression Analysis, FD Model**

Explanatory variables	Variable dependent*			
	Average rating	Moody's	S&P	Fitch
Interceptor	0,122133	0,189623	0,091825	0,110809
statistic-t	2,378972	3,197226	1,506945	1,845395
p value**	0,0181	0,0016	0,1331	0,0662
GDP per capita	-0,000070	-0,000110	-0,000061	-0,000044
statistic-t	-1,679442	-2,248209	-1,251201	-0,929718
p value **	0,0943	0,0254	0,2120	0,3535
Real GDP growth	-0,038642	-0,022807	-0,045766	-0,039898
statistic-t	-2,685081	-1,371798	-2,611446	-2,294273
p value **	0,0077	0,1713	0,0096	0,0227
Inflation	-0,004292	-0,000302	-0,013230	0,001076
statistic-t	-0,728675	-0,044404	-1,802304	0,132448
p value **	0,4669	0,9646	0,0727	0,8947
Central Govt nominal result	0,023326	0,029435	0,019020	0,017326
statistic-t	1,594543	1,741787	1,124009	1,064262
p value **	0,1120	0,0827	0,2621	0,2883
Central Govt gross debt	0,003575	0,002798	0,0063733	0,002094
statistic-t	3,084091	2,088898	2,629044	1,508053
p value **	0,0023	0,0377	0,0091	0,1329
Openness level (natural logarithm)	0,009017	0,006610	0,012554	0,008458
statistic-t	1,378141	0,874415	1,642826	1,118944
p value **	0,1693	0,3827	0,1017	0,2643
Total net external debt	0,009432	0,006683	0,011660	0,012765
statistic-t	4,666139	2,862009	4,951932	5,390890
p value **	0,0000	0,0045	0,0000	0,0000
R <sup>2</sup> adjusted	0,209456	0,120669	0,187951	0,206963
<b>Notes:</b>				
Number of observations: 340.				
To solve the problem of heterocedasticity presented in the four regressions, we used the White procedure, which does not alter the value of the coefficients but renders the calibration deviations statistically consistent.				
* The average ratings, each agency's ratings and the countries comprising the sample are listed in Canuto and Santos (2003).				
**Exact level of significance, or minimum level of significance at which the null hypothesis can be rejected (Ho: coefficient = 0).				

## Conclusion

The credit risk classes assembled by the private rating agencies reflect the frequency of default events, insofar as the latter indicate the probability of default by bond issuers positioned in the rating classes. In the case of sovereign risk, there is a certain arbitrariness about the demarcation between “investment grade” and “speculative grade” in a sequence of default risks which, although increasing explosively in the high risk categories, tends to increase only gradually in the intermediate bands. In any case, in view of the self-regulatory restrictions or constraints on current official regulations present in the funding sources for emerging economies, the position occupied by the bonds of particular countries in the credit risk class-table makes a big difference.

With regard to the relationship between classes of sovereign risk and risk premia charged on the issues, in particular of central government public bonds, their tendency to converge over longer timescales can be observed. The movement of the sovereign ratings is more stable and occurs less vigorously probably because of their long term prospects as opposed to floating spreads of the market.

It is also a fact that there is a pro-cyclical and self-reinforcing interrelationship between ratings and premia insofar as changes in the former frequently exacerbate trends in the latter, although stress situations which could imply sharp rises in risk premia can also be incorporated in credit risk ratings. However, while the lower volatility of ratings is

unquestionable, it is possible to identify certain other structural macroeconomic determinants which explain not only the significant changes in the sovereign risk ratings of countries over long periods but also help to explain levels of country risk premia.

By using rating processes and documents published by the three largest private international rating agencies as a basis, we can point to (and have successfully tested) the weighting of a given group of macroeconomic indicators to explain the broad changes in the classes of sovereign risk of emerging economies. Slower changing variables that influence the dynamic of sustainability of public debt and external debt – the stock of public debt *vis-à-vis* fiscal receipt flows, stock of external debt *vis-à-vis* current foreign exchange receipts, foreign trade flow *vis-à-vis* GDP movement, average GDP growth rates – have all been prominent.

Two policy implications can be drawn. Firstly, the best antidote against high sovereign risk perception and its effect on real domestic interest rates consists of improving the above-mentioned indicators. Improvement would by itself result in enhanced macroeconomic fundamentals in emerging economies as denoted by the consistency between such variables and sovereign risk ratings.

Secondly, it should be emphasized that the explanatory power of the variables arises from them being treated as a whole. There is little to be gained from evolving favorably in certain indicators and not others: piecemeal improvement of the macroeconomic fundamentals tends to generate “decreasing returns” in terms of ratings.

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