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Sovereign Credit Ratings Methodology: An Evaluation

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Treasurer's Department

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Abstract

The views expressed in this Working Paper are those of the author and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This paper describes and evaluates the sovereign credit ratings methodologies of Standard & Poor's, Moody's Investors Service, and Fitch Ratings. A simple definition of ratings failure—based on ratings stability—is proposed and tested, pointing to falling failure rates, consistent upside bias, and strong interagency correlation. Possible causes of ratings failure are separated into informational, analytical, revenue bias, and other incentive problems, each of which is discussed. The paper seeks to highlight methodological developments after the Asian crisis, particularly with regard to the estimation of contingent liabilities and the assessment of international reserves adequacy.

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I. INTRODUCTION

The widespread and longstanding use by private creditors of the credit ratings of Standard & Poor's (S&P), Moody's Investors Service (Moody's), and Fitch Ratings (Fitch) testifies to their utility. This, in turn, stems from the simplicity and comparability of the agencies' risk-grading systems, with broad swathes of analysis condensed into a few bytes of data, and from the perceived analytical strength and independence of the agencies themselves. Issuers seek ratings—and pay for them—in order to broaden their investor pools, or simply to establish risk benchmarks, often turning to two or even three ratings agencies at the same time. Investors use ratings in their pricing calculations, and in decisions to buy, sell, or hold securities, and it is common to see ratings on one axis of the risk-return plot. Flawed or not, credit ratings are an integral—and often misunderstood—part of today's increasingly integrated capital markets.

The ratings agencies maintain what amounts to a global credit risk architecture. Combining empirical experience with economic, financial, and legal logic, they bring together a dynamic and interrelated web of ratings on preferred creditor institutions, national governments, and bilateral creditor organizations; regional, local, and municipal administrations; public and private sector banks, insurers, corporations, and projects; and an increasingly complex array of credit-enhancing structured finance transactions. Like a jigsaw puzzle piece, each rating forms part of a larger picture. Like a commodity, risk is traded, manipulated, amplified, and mitigated. Risk engineering has become big business, with regulators often struggling to keep pace with industry developments.

Sovereign ratings are a fundamental building block in this architecture. Reflecting the unique nature of sovereign authority—to tax, issue currency, regulate, expropriate, and wage war—a sovereign government will normally stand at the apex of the ratings within its jurisdiction, with its bond yields serving as the “zero-risk return” benchmark against which returns on other domestic investments are compared. Some issuers acquire sovereign creditworthiness by securing guarantees and, in so doing, dilute sovereign creditworthiness. Others insulate themselves from sovereign interventions by maintaining operations or retaining export proceeds abroad and, in so doing, breach the “sovereign ceiling”. The creditworthiness of each sovereign, in turn, is measured relative to that of the most robust issuers—the ‘AAA’ issuers—the most prominent of which is the U.S. government, whose bonds are generally regarded as the global risk-free benchmark. Changes in sovereign ratings can have far-reaching implications.

Sovereign ratings were put to the test in 1997–2002. The Asian crisis in 1997 exposed the shortcomings of a ratings approach based on macroeconomic fundamentals alone, and underscored the centrality of contingent liability and international liquidity considerations. The Russian crisis in 1998 challenged, then reinforced, traditional views on the relative likelihood of defaults on local currency vs. foreign currency sovereign debt. A Eurobond default by Pakistan in 1999 signaled a new official sector willingness to impose burden sharing on bondholders, and heightened the need for instrument-by-instrument vigilance in selective default scenarios. The bond exchange by Pakistan, and one by Ecuador in 2000,

generated demand for forward-looking ratings on the new instruments on offer and pointed to a role for the ratings agencies as providers of impartial credit opinions in debt-restructuring situations. The Argentine crisis in 2001–02 resulted in the largest sovereign international bond default in history. Finally, as Uruguay slipped into financial turmoil in 2002, the ratings agencies once more responded late, underscoring the challenges that remain.

This paper seeks to describe both rules-based and discretionary elements in the sovereign ratings process. By delving into the “black box” of ratings methodology, it differentiates itself from the body of literature that seeks to explain sovereign ratings in a formulaic manner from an outside perspective. Constrained by information availability and the requirements of brevity, some sections of the paper focus on one of the three principal agencies, S&P, while others cover Moody’s and Fitch in equal measure. The paper begins by walking the reader through current sovereign ratings methodology (Section II). It goes on to propose and test a simple definition of ratings failure, identify possible causes of failure, and discuss methodological changes in the period since the Asian crisis (Section III). The paper concludes by reviewing key points and making some recommendations for further research (Section IV).

II. RATINGS METHODOLOGY

A. Ratings Definitions and Nomenclature

The sovereign credit ratings of S&P, Moody’s, and Fitch indicate the capacity and willingness of rated governments to repay commercial debt obligations in full and on time. Subsumed within this definition are the following two important points.

- **By obligor, the ratings focus exclusively on the creditworthiness of central governments,** providing an assessment of sovereign risk (as opposed to country risk²), and generally serve as a ceiling for other ratings within the jurisdiction.
- **By obligation, the ratings focus exclusively on the creditworthiness of sovereign debt to private creditors** (bank loans, Treasury bills, bonds, etc.), and provide no assessment of the credit risk on sovereign debt to official creditors.³

The ratings-agency objective function is, thus, narrow and well defined. S&P’s ratings seek to capture only the probability of the occurrence of default, $\rho(d)$, not the severity of default, and provide no assessment of expected time in default, mode of default resolution, or

² Country risk is usually taken to mean the risk of sovereign interference in the business conduct of subsovereign entities within the national jurisdiction, including transfer and convertibility risk.

³ Credit risk on sovereign debt to private creditors is, of course, intertwined with that on sovereign debt to official creditors.

recovery values more generally. Moody's ratings focus on expected loss, L_e , which is a function of both the probability of default and the expected recovery rate, r_e , after default has occurred:

$$L_e = \rho(d) \cdot (1 - r_e) \quad (\text{Equation II.A.1})$$

Fitch's ratings are a hybrid, focusing only on the probability of default until the point when default occurs, and differentiating on the basis of expected recovery rates after default has occurred.

Box 1. Sovereign Ratings History in Brief

Sovereign credit ratings predate the Bretton Woods institutions. Moody's, established in 1900, issued its first sovereign ratings just before World War I. During the 1920s, driven by rapid expansion of the U.S. capital markets, it rated an increasing number of sovereign Yankee bond issues, as did the predecessors to S&P, Poor's Publishing and Standard Statistics.

By 1929, Poor's Publishing rated Yankee bonds issued by 21 national governments: 11 in Europe (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Norway, and the United Kingdom), five in South America (Argentina, Chile, Colombia, Peru, and Uruguay), three in Asia (Australia, China, and Japan), and two in North America (Canada and the United States). Ratings ranged from 'AAAAA' (a category that no longer exists) for the United States to 'B' for China and Greece, with most of the European sovereigns in the investment grade and all of the South American sovereigns in the speculative grade except Argentina, at 'A'.

Sovereign defaults spiked during the 1930s depression and most ratings were downgraded. By 1935, Standard Statistics rated Chile and Peru at 'D', and Germany and Japan in the low speculative grade. In the late 1930s, as World War II approached, European ratings fell rapidly. By 1939, all European sovereigns were in the speculative grade, except for the United Kingdom, at 'AA'. Germany was downgraded to 'D' in October 1939. Most sovereign ratings were suspended during the war, with the exception of those on Canada, the United States, and a few South American republics. Poor's Publishing and Standard Statistics merged to form S&P in 1941.

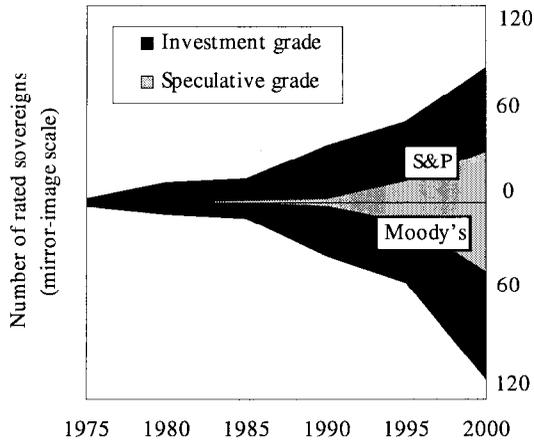
After the war, S&P and Moody's again began to rate Yankee bonds issued by major industrialized countries. By 1960, S&P rated seven sovereigns: Canada and the United States, both at 'AAA'; and Australia, Austria, Belgium, Japan, and Norway, all at 'BBB'. In 1963 the Interest Equalization Tax (IET), a 15 percent levy on interest earned from foreign borrowers other than those domiciled in Canada, was introduced in the United States. The IET drove cross-border financing activity out of the U.S. markets, primarily back to London, the old nineteenth century hub. In 1968, S&P suspended all its sovereign ratings except those on Canada and the United States, which remained at 'AAA'.

The IET was withdrawn in 1974. Modern sovereign credit ratings are a phenomenon of the post-IET period.

S&P and Moody's continued to dominate the industry at the turn of the twenty-first century, with a combined market share of about 80 percent of all ratings revenue. Fitch, formed via successive mergers in 1997–2000 between Fitch Investor Services, IBCA, and Duff & Phelps, had successfully captured the market niche for the potentially tie-breaking third opinion on many obligors.

Sources: Beers and Chambers (1999); Levey (2002); and Westlake (2000).

Figure 1. Sovereign Ratings Histories Compared, 1975–2000



Sources: See Appendix Tables A1 and A2.

Modern sovereign ratings are a relatively new phenomenon (Box 1 and Figure 1). At the beginning of 1975, S&P rated only Canada and the United States, Moody's rated Canada, the United States, and Australia, and the predecessors to Fitch posed no serious challenge to the industry duopoly. Sovereign ratings activity grew steadily through the 1980s, but focused almost entirely on the industrialized countries. By 1990, S&P and Moody's rated 35 and 33 sovereigns, respectively, among which were Argentina, Brazil, and Venezuela. Sovereign ratings continued to proliferate during the 1990s, by which time emerging-market and transition economies had become the key source of growth

(Appendix Tables A1 and A2). By 2000, S&P and Moody's rated 83 and 108 sovereigns, respectively, of which almost 40 percent were in the speculative grade, and sovereign ratings methodologies were adapting to the more stringent demands of surveillance on low-credit-quality issuers.

As of end-July 2002, S&P had made public its ratings on 93 sovereign governments, Moody's on 109, and Fitch on 77 (Table 1). Most of these sovereigns had signed fee-paying and information-sharing agreements with each agency, with annual fees levied either as a proportion of debt issuance volumes or, in the case of large issuers, as mutually agreed lump sums. By end-July 2002, the universe of rated sovereigns included all significant issuers of cross-border commercial debt, but very few of the world's poorest countries. Only 11 countries eligible for the IMF's concessional Poverty Reduction and Growth Facility loans had opted to be rated, of which only five (Bolivia, Honduras, Nicaragua, Senegal, and Vietnam) were eligible for debt reduction under the Heavily Indebted Poor Country Initiative. In most cases, sovereign ratings also served as country ceilings, in that few locally domiciled entities were rated above the governing sovereign.⁴

⁴ See Beers and Feinland-Katz (2001). Exceptions to the country-ceiling rule often depend on the extent to which the entities in question are insulated from sovereign interventions, including by virtue of their strategic importance or extensive foreign operations.

Table 1. Long-Term Foreign Currency Sovereign Ratings Compared
(As of end-July 2002)

Country 1/	S&P	Moody's	Fitch	Country 1/	S&P	Moody's	Fitch
<i>GRA countries</i>				Mexico	BBB-	Baa2	BBB-
Argentina	SD	Ca	DDD	Morocco	BB	Ba1	--
Australia	AA+	Aa2	AA	Netherlands	AAA	Aaa	AAA
Austria	AAA	Aaa	AAA	New Zealand	AA+	Aa2	AA
Bahamas	--	A3	--	Norway	AAA	Aaa	AAA
Bahrain	A-	Ba1	BBB	Oman	BBB	Baa2	--
Barbados	A-	Baa2	--	Panama	BB	Ba1	BB+
Belgium	AA+	Aa1	AA	Papua New Guinea	B	B1	B+
Belize	BB-	Ba2	--	Paraguay	B	B2	--
Botswana	A	A2	--	Peru	BB-	Ba3	BB-
Brazil	B+	B1	B+	Philippines	BB+	Ba1	BB+
Bulgaria	BB-	B1	BB-	Poland	BBB+	Baa1	BBB+
Canada	AAA	Aaa	AA+	Portugal	AA	Aa2	AA
Chile	A-	Baa1	A-	Qatar	A-	Baa2	--
China	BBB	A3	A-	Romania	B+	B2	B+
Colombia	BB	Ba2	BB	Russia	BB-	Ba3	BB-
Costa Rica	BB	Ba1	BB	Saudi Arabia	--	Baa3	--
Croatia	BBB-	Baa3	BBB-	Singapore	AAA	Aaa	AA+
Cyprus	A	A2	A+	Slovak Republic	--	Baa3	BB+
Czech Republic	A-	Baa1	BBB+	Slovenia	A	A2	A
Denmark	AAA	Aaa	AA+	South Africa	BBB-	Baa2	BBB-
Dominican Republic	BB-	Ba2	--	Spain	AA+	Aaa	AA+
Ecuador	CCC+	Caa2	--	Suriname	B-	--	--
Egypt	BB+	Ba1	BBB-	Sweden	AA+	Aaa	AA+
El Salvador	BB+	Baa3	BB+	Switzerland	AAA	Aaa	AAA
Estonia	A-	Baa1	A-	Thailand	BBB-	Baa3	BBB-
Fiji	--	Ba2	--	Trinidad and Tobago	BBB-	Baa3	--
Finland	AAA	Aaa	AAA	Tunisia	BBB	--	BBB
France	AAA	Aaa	AAA	Turkey	B-	B1	B
Germany	AAA	Aaa	AAA	Turkmenistan	--	B2	CCC-
Greece	A	A2	A	Ukraine	B	B2	B
Guatemala	BB	Ba2	--	United Arab Emirates	--	A2	--
Hungary	A-	A3	A-	United Kingdom	AAA	Aaa	AAA
Iceland	A+	Aa3	AA-	United States	AAA	Aaa	AAA
Indonesia	SD	B3	B-	Uruguay	B	B1	B+
Iran	--	--	B+	Venezuela	B	B2	B
Ireland	AAA	Aaa	AAA	<i>PRGF countries</i>			
Israel	A-	A2	A-	Azerbaijan	--	--	BB-
Italy	AA	Aa2	AA	Bolivia	B+	B1	--
Jamaica	B+	Ba3	--	Grenada	BB-	--	--
Japan	AA-	A2	AA	Honduras	--	B2	--
Jordan	BB-	Ba3	--	India	BB	Ba2	BB
Kazakhstan	BB	Ba2	BB	Moldova	--	Ca	DD
Korea	A-	A3	A	Mongolia	B	--	--
Kuwait	A+	A2	AA-	Nicaragua	--	B2	--
Latvia	BBB	Baa2	BBB	Pakistan	B-	B3	--
Lebanon	B-	B2	B-	Senegal	B+	--	--
Lithuania	BBB	Ba1	BBB-	Vietnam	BB-	B1	BB-
Luxembourg	AAA	Aaa	AAA				
Malaysia	BBB	Baa2	BBB				
Malta	A	A3	A				
Mauritius	--	Baa2	--				

Sources: Fitch ratings data from Bloomberg L.P.;
Moody's ratings data from Bloomberg L.P.; and S&P (2002).

1/ Includes IMF member countries only.

Abbreviations: -- = Not rated

GRA = General Resources Account
PRGF = Poverty Reduction and
Growth Facility

Table 2. Linear Transposition of Issuer Ratings Scales

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

Abbreviation: -- = Not applicable.

S&P, Moody's, and Fitch produce two distinct types of credit ratings: issuer ratings and debt ratings.

Issuer ratings—referred to as sovereign ratings when the issuer is a national government—indicate the general credit standing of the rated entity. Debt ratings—referred to as senior unsecured ratings when the issuer is a sovereign—indicate the specific credit standing of individual debt instruments. At most ratings levels, sovereign and senior unsecured debt ratings are treated as an identity. At the lowest ratings levels, however, sovereign and senior unsecured debt ratings can diverge, reflecting the nuances of sovereign default strategies. In practice, general default by sovereigns—i.e., default on all outstanding debt—is rare. Typically, defaults are selective and sequenced, reflecting the *de facto* if not *de jure* seniority of certain classes of sovereign debt.

Each agency's ratings scale applies equally to all classes of obligors, sovereign as well as subsovereign (Tables 2 and 3). The long-term issuer and issue ratings of S&P and Fitch run from 'AAA' to 'AA' to 'A' to 'BBB', and so onwards to 'D'. With the exception of the 'AAA' ratings category at the top and the 'CC', 'C', and 'D' categories at the bottom, all other categories are qualified by plus and minus signs. Moody's ratings run from 'Aaa' to 'Aa' to 'A' to 'Baa', and so onwards to 'C'. With the exception of the 'Aaa' category at the top and the 'Ca' and 'C' categories at the bottom, all other categories are qualified by ordinal numbers from one to three. Long-

term ratings of 'BBB-' or 'Baa3' and above are referred to as "investment grade", while those of 'BB+' or 'Ba1' and below are referred to as "speculative grade" or "high yield", a distinction that is reflected in the investment guidelines of many institutional investors worldwide.

The forward-looking time horizon for a long-term sovereign credit rating coincides roughly with the typical maturity of an emerging-market bond, i.e., three-to-five years (although, in practice, the analysis rarely projects out for more than three years). The time horizon for a long-term senior unsecured debt rating is dictated by the maturity of the specific rated instrument. Each long-term sovereign credit rating is also assigned an outlook—Positive, Stable, Negative, or (rarely) Developing—which indicates the likely trend in the rating over the next one-to-three years. In times of heightened uncertainty, the outlook may be supplanted by a watch listing—Positive, Negative, or Developing—which indicates

the likelihood of near-term developments that could potentially trigger ratings upgrades or downgrades within the next one-to-three months.

Each agency also issues short-term sovereign and senior unsecured ratings, intended to provide assessments of creditworthiness for a time horizon of up to one year. These ratings, set on separate scales from those of the long-term ratings, are of limited utility, and are generated more-or-less automatically, based on pre-prescribed correlations with long-term ratings. Outlooks apply only to long-term ratings, and are normally appended only to issuer credit ratings (although, in exceptional circumstances, they may be assigned to long-term debt ratings also). Watch listings (referred to as “CreditWatch” listings by S&P, as “on review for possible upgrade/downgrade” by Moody’s, and as “alerts” by Fitch) apply to all ratings: long- and short-term, on issuers and on specific debt instruments.

The only absolute anchor in any credit ratings scale is the rating that indicates default. Conceptually, all other ratings categories can be characterized as indicators of the “degree of separation” from default, with the interstitial distance determined by a delicate balance of strengths, weaknesses, flexibilities, and rigidities. To the extent that default is the “end-game” of risk assessment, clear definitions of the chains of events that constitute entry into default are crucial to the ratings endeavor.

S&P, Moody’s, and Fitch all define default as:

- **failure to pay a material sum of interest or principal on a debt instrument on its due date or within applicable principal or interest grace periods**, as stipulated in the governing debt indenture; or
- **rescheduling, exchange, or other restructuring of a debt instrument conducted in a manner deemed to be coercive, involuntary, and distressed**, as determined on a case-by-case basis by each agency.⁵

The two parts of the above definition address “outright default” and “restructuring default” respectively. In both cases, default determinations are independent of whether or not creditors have invoked event-of-default clauses in the governing debt indenture, accelerated remaining debt-service obligations, attached collateral, or mounted other legal proceedings. By emphasizing value judgments over legal considerations, all three ratings agencies seek to counter incentives—confronting debtors and creditors alike—to conceal occurrences of default, and confer upon themselves the role of independent arbiter of *de facto* rather than *de jure* default. Default-concealment incentives range from “loss-of-face” considerations to implications for loan-loss provisioning and secondary market pricing. The default-concealment problem is especially acute in the sovereign sector, where debtors are unique in the latitude they enjoy in deciding which obligations to pay and which not to pay.

⁵ See Keenan (2000); and Samson (2001).

Judgments on whether a debt restructuring is voluntary or coercive are made *ex ante*, and do not hinge on whether the net present value (NPV) of future debt-service streams is likely to be “haircut”. NPV calculations are hampered by the fact that, in stress situations, appropriate discount rates—accurately reflecting the relative risks of old vs. new debt instruments—may be indeterminate. Even debt restructurings that are expected to feature NPV giveaways—face value, interest rate, or cash “sweeteners” designed to encourage creditor participation—may be deemed to be defaults, because creditors may be averse to extending their exposures at any price. In such cases, S&P, Moody’s, and Fitch judge that, despite the sweeteners, the primary motivation for creditor participation will be an expectation that nonparticipants shall suffer adverse consequences, and that the exchange is therefore “voluntary” in letter but not in spirit. The timing of the downgrade of the affected debt rating to the default level is determined by the speed at which the agencies are able to arrive at such a judgment.

Unlike definitions of entry into default, definitions of the chains of events that constitute exit from default necessarily depend on the settlement of creditor claims. S&P, Moody’s, and Fitch all deem a default to have been cured when the affected debt instrument is either modified or withdrawn. In the case of modification, closure is reached at the point when a new or amended debt indenture (agreed through collective action procedures laid down in the superseded indenture) comes into force. In the case of withdrawal, usually as a consequence of a successful debt exchange, the agencies disregard as immaterial small residual sums of unexchanged (and therefore unwithdrawn) debt, and rescind their ratings as if the defaulted instruments had been withdrawn in their entirety.⁶ In debt exchanges, default ratings are generally withdrawn on the first exchange date, unless doubts remain on whether or not the exchange will be successful

The only rating in any of the three ratings agencies’ scales that applies to issuers but not to specific debt issues is S&P’s ‘SD’ (‘Selective Default’) rating, added to its nomenclature in January 1999. An issuer rated ‘SD’ is in default on some of its debt obligations to private creditors but continues to honor other debts to private or official creditors. In contrast, an issuer rated ‘D’ by S&P is in general default, a condition that rarely applies to sovereign governments. In its issue ratings scale, S&P reserves the ‘D’ rating for debt instruments in default. Fitch rates defaulted debt at ‘DDD’, ‘DD’, or ‘D’, in decreasing order of expected recovery value. Moody’s rates defaulted debt at ‘Caa’, ‘Ca’, or ‘C’, although those ratings categories can also apply to undefaulted (but “highly speculative”) debt instruments.

⁶ “Success” in this context is not defined precisely, but can be taken to mean participation by creditors holding, say, 95 percent or more of eligible principal.

Table 3. S&P Foreign Currency Sovereign Ratings and Default Probabilities
(As of end-July 2002)

Long-term foreign currency sovereign rating	Implied 5-year default probability 1/	Countries 2/
<i>Investment grade</i>	<i>Average: 0.88%</i>	<i>Number of countries: 56</i>
AAA	0.10%	Austria, Canada, Denmark, Finland, France, Germany, Ireland, Isle of Man, Liechtenstein, Luxembourg, Netherlands, Norway, Singapore, Switzerland, United Kingdom, United States
AA+	0.19%	Australia, Belgium, New Zealand, Spain, Sweden
AA	0.08%	Bermuda, Italy, Portugal, Taiwan Province of China
AA-	0.51%	Japan
A+	0.62%	Hong Kong SAR, Iceland, Kuwait
A	0.43%	Botswana, Cyprus, Greece, Malta, Slovenia
A-	0.78%	Bahrain, Barbados, Chile, Czech Republic, Estonia, Hungary, Israel, Korea, Qatar
BBB+	1.60%	Poland
BBB	2.04%	China, Latvia, Lithuania, Malaysia, Oman, Tunisia
BBB-	3.02%	Croatia, Mexico, Slovak Republic, South Africa, Thailand, Trinidad and Tobago
<i>Speculative grade</i>	<i>Average: 19.48%</i>	<i>Number of countries: 37</i>
BB+	5.69%	Egypt, El Salvador, Philippines
BB	8.94%	Colombia, Costa Rica, Guatemala, India, Kazakhstan, Morocco, Panama
BB-	14.73%	Belize, Bulgaria, Dominican Republic, Grenada, Jordan, Peru, Russia, Vietnam
B+	20.40%	Bolivia, Brazil, Jamaica, Romania, Senegal
B	30.23%	Cook Islands, Mongolia, Papua New Guinea, Paraguay, Ukraine, Uruguay, Venezuela
B-	36.69%	Lebanon, Pakistan, Suriname, Turkey
CCC+	--	Ecuador
CCC 3/	46.87%	--
CCC-	--	--
CC	--	--
C	--	--
SD	In selective default	Argentina, Indonesia
D	In general default	--

Sources: Bos and Brady (2002); and S&P (2002).

1/ Calculated from the incidences of default within five years of "static pools" of corporate issuers rated at the applicable starting level on the first day of each year, averaged for all such pools in the 1981–2001 period. Covers 9,769 rated corporate obligors and an undisclosed number of default observations. Insufficient sample size precludes the calculation of statistically meaningful sovereign-specific default rates.

2/ Includes entities that S&P may consider to be sovereign governments though not generally classed as such.

3/ Average for corporate issuers rated 'CCC+', 'CCC', or 'CCC-' on the first day of each five-year period.

Abbreviation: -- = Not rated or not applicable.

B. Ratings Committees and Peer Analysis

In the absence of robust statistical testing, sovereign creditworthiness remains a relatively subjective concept. The limited predictability of economic behavior in general and of political developments in particular leaves the task of credit ratings assessment poorly suited to formulaic straightjackets. As a result, S&P, Moody's, and Fitch have over time developed decision-making methodologies that blend objective, numerical analysis with subjective, informed debate.

The principal forum for all sovereign ratings decisions is the ratings committee.⁷ Typically, the analyst with primary responsibility for the credit in question will distribute, in advance, a ratings recommendation, macroeconomic data and projections, and a supporting draft report, 5,000–10,000 words in length. The committee is attended by analysts with a range of experience, cutting across geographic regions and ratings categories. The most senior analyst present serves as chairman, and nominate three, five, or seven of the attendees—those with the most relevant experience—as voting members. In the committee, each analytical category is debated and assigned a score by vote. Following closing arguments, the ratings are decided by vote, and the resulting decision is binding.⁸ After the committee, the report is amended to fully incorporate the majority view, and is published.

Although ratings are measures of absolute creditworthiness, in practice, the ratings exercise is highly comparative in nature. In committee, each voting member must assess the sovereign in question both in terms of its timeline and its relative ranking. On one level, the ratings task is one of continuously sorting the universe of rated sovereigns—assessed under one uniform set of criteria—to ensure that the resulting list of sovereigns presents a meaningful global order of credit standing. On another level, the sorting task is constrained by a parallel need to respect each sovereign's progression over time, such that shifting peer comparisons become a necessary condition—but not a sufficient condition—for upward or downward ratings action.

Peer analysis is central to the ratings endeavor. To prevent the unintended evolution of different criteria subsets for different regions, peer sovereigns are defined in terms of ratings rather than geographic location. Argentina may be measured against Indonesia, Turkey against Pakistan, or Kuwait against Botswana. Global comparability is reinforced by an institutional mechanism that expects Latin America analysts to bring their experience to bear on Asia, Eastern Europe analysts on the Middle East, and so on, as a matter of routine.

Ratings committees are convened as and when necessary. In a normal review cycle, the committee is held several weeks after a country visit by the relevant analytical team

⁷ See Hilderman (1999).

⁸ There do exist appeals processes, whereby issuers can ask committees to reconvene to consider “material” new information.

(typically the primary analyst and one backup analyst). Country visits take place at a frequency ranging from six to 24 months, depending on the volatility and prominence of the sovereign, and typically involve three days of meetings. During the visit, consultations are held with policy makers at the central bank, the finance ministry, and other ministries, as well as with representatives of the financial sector, the nonfinancial private sector, the media, academia, and (if permissible) the political opposition. Following the visit, policy thrusts are summarized, spreadsheets updated, and ratings recommendations deliberated, ahead of the committee. When rapid developments occur, however, committees are convened *ad hoc*, dispensing with the normal review cycle. The timeliness of such “abbreviated reviews” depends on the alertness of individual analysts and managers, with necessary calls to action sometimes triggered by *ex post* media reportage.

C. S&P’s Sovereign Ratings Ramp

In order to impose discipline upon its ratings processes, S&P has in recent years instituted a sovereign ratings “ramp”.⁹ As per this ramp, the analysis is disaggregated into a number of categories (Box 2), each of which is discussed separately in committee, as a precursor to the assignment of a score. Scores range from one (most robust) to six (least robust). The score for each ramp category is defined in terms of key considerations and parameters. In the case of numerical parameters, guidelines for cutoff levels between scores are set to ensure a more-or-less even distribution of sovereigns across the range of scores. Ramp scores are not disseminated to the public. The unweighted sum of individual scores for a given sovereign are compared with those of its peers to provide a “sense check” for the ratings. Although ramp score comparisons do not dictate ratings *per se*, there is a strong rank-order correlation between aggregate ramp scores and sovereign ratings. Deviations of ratings from the levels implied by the global ramp score sequence require reasoned argument in committee.

The content of the ramp, in turn, is deliberated at annual criteria meetings involving the entire sovereign ratings group. Emphasis is placed on the gradual evolution of methodology. Every change of the ramp requires up to two years to operationalize, in as much as all rated sovereigns must first be discussed in committee within the modified analytical framework before ramp score comparisons can once more be considered internally consistent. As of April 2002, S&P’s sovereign ratings ramp consisted of ten analytical categories, described below.

⁹ See Beers, Cavanaugh, and Ogawa (2002); Cantor and Fons (1999); Fitch (2001); Fitch IBCA (1998); and Moody’s (1998). Fitch and Moody’s have broadly similar sovereign ratings checklists, but this section will focus on S&P. “Ramp” is an industry term alluding to the scoring slope.

Box 2. S&P Sovereign Ratings Ramp, 2002

(As of April 2002)

<u>Ramp category</u>	<u>Key risk factors</u>	<u>Key comparator variables</u>
1. Political stability	Political event risk	--
2. Economic prospects I: structure	Economic prosperity, diversity and resilience	• Nominal US\$ GDP per capita
3. Economic prospects II: growth	Economic growth trends	• Growth of real local currency GDP per capita
4. Fiscal flexibility I: revenue, expenditure and balance performance	Budgetary flexibility	• General government fiscal balance/GDP
5. Fiscal flexibility II: debt and interest burdens	Strength of government balance sheet	• General government net debt/GDP • General government gross interest payments/Gross revenue
6. Fiscal flexibility III: off-budget and contingent liabilities	Unreported and contingent claims on sovereign balance sheet	• Estimated off-budget and contingent liabilities/GDP
7. Monetary stability	Sustainability of monetary and exchange rate policies	• Core inflation
8. External flexibility I: liquidity	Reserves adequacy and market access	• Gross external financing requirement/Gross usable reserves
9. External flexibility II: public sector net external debt	Strength of public sector external balance sheet	• Public sector net external debt/Current account receipts
10. External flexibility III: bank and private sector net external debt	Strength of financial system and nonfinancial private sector external balance sheets	• Financial system net external debt/Current account receipts • Nonfinancial private sector net external debt/Current account receipts

Source: Beers, Cavanaugh, and Ogawa (2002).

1. Political stability

The political stability ramp score aims to capture political event risk, along with some assessment of institutional depth, decision-making breadth, policy flexibility, global integration, geopolitical stability, and relations with official creditors. Political event risk, specifically, refers to the probability of war, revolution, civil unrest, or extraconstitutional

regime change, all of which are closely correlated with sovereign debt default.¹⁰ Institutional and geopolitical considerations, in turn, attempt to gauge constraints on policy flexibility and resolve, and the weight of the government's stake in the world financial system, issues that are revisited in several subsequent ramp categories.

Factors considered in the political assessment include: levels of democratization; concentration of decision making; clarity of leadership-succession mechanisms; independence of the judiciary; freedom of the press; ethnic, religious, and age-wise demographic breakdowns; human development indicators; policy consensus among political parties; and track records in past stress scenarios.¹¹ In addition to discourse with independent political observers, key inputs include the Economist Intelligence Unit's *Country Reports* and *Country Profiles*, Transparency International's *Corruption Perceptions Index*, and Freedom House's list of "true democracies".

2. Economic prospects I: structure

The economic structure score seeks to encapsulate economic prosperity, diversity, and resilience. Scoring guidelines are prescribed in terms of projected nominal U.S. dollar GDP per capita. Other considerations include: the variability of economic performance; income disparities (measured by the Gini Ratio); openness to international trade (exports and imports as a proportion of GDP, average import tariffs, and nontariff barriers); the diversification of output, exports, and ownership of productive assets (various rudimentary measures of concentration); the level of intermediation (deposits and domestic nongovernment bank credit as a proportion of GDP); the efficiency of savings allocation (the incremental capital-output ratio); the size of the public sector (as a share of investment and output); and "structural impediments" to growth (such as distortionary industrial or agricultural policies).

GDP per capita is viewed as a comprehensive proxy for the level of development of the economy as a whole and, thence, for its resilience to political and economic shocks.¹² Indeed, reinforcing the intuitive reasoning that a rich debtor is normally a better credit risk than a poor debtor, various studies find GDP per capita to be among the most important

¹⁰ See Beers and Bhatia (1999). S&P's periodic *Sovereign Default Surveys*, which attempt to track the default histories since 1824 of all rated and unrated national governments, illustrate the relationship between political discontinuities—the Russian Revolution, World War II—and defaults on sovereign debt.

¹¹ These factors became highly relevant for Indonesia in 1997–98, after decades of largely illusory political stability.

¹² The adequacy of income levels alone in explaining the resilience of poor but diversified economies such as India is subject to ongoing debate.

explanatory variables for sovereign credit ratings.¹³ Real sector data are usually collected directly from national authorities.

3. Economic prospects II: growth

The economic growth ramp score aims to capture the dynamism of the economy on a trend basis. Scoring guidelines are prescribed in terms of the projected rate of growth of real local currency GDP per capita. The emphasis on trends in this and other ratios is important, because the ratings seek to forewarn of structural vulnerabilities and are not intended to move with business cycles or “lumpy” investment projects. In oil economies, for instance, this structural approach necessitates careful consideration of both oil and nonoil growth prospects, while in highly leveraged economies the likelihood and economic cost (i.e., growth impact) of potential financial sector problems become important analytical issues. In times of heightened uncertainty, greater attention is paid to possible early-warning signals provided by movements in key domestic stock indices, in deference to the potentially superior corporate sector knowledge of market participants.¹⁴

To the extent that poor economies often enjoy greater growth potential than their rich counterparts, the economic growth ramp score can act as a counterweight to the economic structure score, although this effect is tempered by the inclusion of population growth within the scoring parameter. From the sovereign ratings perspective, growth prospects are a measure of the economy’s capacity to generate government revenue and employment, supporting fiscal flexibility and facilitating structural adjustment.

4. Fiscal flexibility I: revenue, expenditure, and balance performance

The first fiscal score seeks to encapsulate government budgetary flexibility. Scoring guidelines are prescribed in terms of the projected ratio of the general government fiscal balance to GDP, with divestment proceeds treated as a financing item. General government is defined to include the central government, the central bank, the provincial governments, and the state pension funds, as applicable, but not the financial or nonfinancial public sector enterprises. Related considerations include: the potential for additional revenue mobilization (involving some assessment of revenue elasticities, the reliance on trade taxes, and the potential to increase public enterprise dividends); the rigidity of primary expenditures (recurrent vs. capital outlays, administrative and defense burdens, and infrastructure requirements); the variability of interest payments (fixed- vs. floating-rate payments and translation effects); actual and potential privatization proceeds (size and profitability of the public sector and political will to privatize); and gross and net borrowing requirements and

¹³ See Cantor and Packer (1996); and Haque and others (1996).

¹⁴ This was especially the case for Malaysia in late 1997, when great uncertainty surrounded the growth projections for 1998.

their financing (domestic vs. external borrowing, extent of commercial financing vs. access to concessional resources, plus any arrears accumulation).

The fiscal flows score marks the progression of the sovereign ratings ramp from analysis of the government's operating environment to analysis of the government itself.

In order to facilitate peer comparisons, all data are assembled at the general government level.¹⁵ In order to achieve a clear separation between sunk costs and contingent liabilities, expenditure estimates incorporate outlays resulting from past financial sector bailouts, regardless of whether recapitalization bonds have been issued on or off budget. Where zero-coupon instruments are issued, associated interest outlays are imputed. Fiscal data are almost always collected directly from national authorities, but baseline projections will borrow heavily from IMF medium-term frameworks and, for program countries, from IMF performance criteria.

5. *Fiscal flexibility II: debt and interest burdens*

The second fiscal score seeks to measure the strength of the government balance sheet.

Scoring guidelines are prescribed in terms of the projected ratios of general government net debt to GDP and general government gross interest payments to general government revenues. Gross debt is defined to include all government or government-guaranteed financial liabilities, including debt placed with the central bank; all bank recapitalization bonds, regardless of whether issued by the government or the central bank; and all central bank or central bank-guaranteed external financial liabilities, including obligations to the IMF, other swaps, and international bonds issued by the central bank (a practice in some countries).¹⁶ Gross assets are defined to include all government financial assets, excluding deposits placed with the central bank; and all central bank external financial assets.

The fiscal stocks score combines two balance sheet parameters in an attempt to utilize both gross and net measures of solvency. The partial consolidation of government and central bank balance sheets is a pragmatic response to the practice by several governments of turning their accumulated fiscal surpluses over to their central banks for management.¹⁷ Although not a liquidity assessment *per se*, the fiscal stocks category also requires the documentation of government debt by interest and maturity structure (including embedded

¹⁵ Expenditure pressures at the provincial government level were a major factor behind fiscal slippages in Argentina in 2000–01.

¹⁶ Guaranteed debt is included only if the concerned guarantees are explicit, full, and timely. Guaranteed bank deposits are not included, regardless of the form of guarantee, because financial system contingent liabilities are treated in the third fiscal ramp category.

¹⁷ This was highlighted in early 2001 during the new ratings exercise for Botswana, where there is no separation between fiscal and monetary reserves.

put options) and by currency composition—occasionally instrument-by-instrument—in order to facilitate stress testing.

6. Fiscal flexibility III: off-budget and contingent liabilities

The third fiscal score seeks to quantify unreported and contingent claims on the general government balance sheet. Scoring guidelines are prescribed in terms of the ratio of estimated off-budget and contingent sovereign liabilities to GDP. The contingent liabilities estimate is the sum of two subestimates: one for the potential upfront fiscal cost of financial system distress in a “reasonable worst-case scenario”; and one for the indebtedness of “non-self supporting” public enterprises to creditors outside the domestic financial system, i.e., external creditors and domestic retail bondholders.

Potential financial system bailout costs are estimated in a systematic manner (Box 3). S&P’s financial institutions ratings group classifies 68 national financial systems into five “risk buckets”, each with an associated ratio of potential peak gross problematic assets (GPAs) to domestic nongovernment bank credit (Table 4). Peak GPAs incorporate S&P’s judgment on the potential magnitude of asset quality deterioration in a reasonable worst-case scenario; are re-assessed biannually; and are disseminated annually through S&P’s *Global Financial System Stress* series of publications.¹⁸ Assumptions are made for the potential trajectories of general and specific provisions in a stress scenario, and for the future pace of credit growth. The peak GPA ratio less the peak provisioning ratio multiplied by projected domestic nongovernment credit yields the total financial system recapitalization cost. Finally, the share of this cost that is apportioned to the government as a contingent liability depends on case-by-case judgments, taking into account factors such as the extent of government and foreign ownership of the domestic financial system.

Introduced in the wake of the Asian crisis, the contingent liabilities score is an attempt to track fiscal policies implemented through financial system repression and other opaque means.¹⁹ For any rated sovereign not classified in the financial institutions group’s risk buckets, conservative assumptions are made, with domestically owned banks receiving GPA ratios that reflect local prudential and supervisory standards, and foreign owned banks the GPA ratios of their parent systems. The contingent liabilities ramp category penalizes sovereigns that combine weak prudential standards with high levels of intermediation and nongovernment leverage. Monetary data are collected from national authorities and cross-checked against data reported by the IMF.

¹⁸ See Bugie and others (2001).

¹⁹ Several ratings downgrades on Indonesia, Korea, Malaysia, and Thailand in 1997–98 followed upward revisions to contingent liabilities estimates.

Box 3. Assessing “True” Financial System Asset Quality

The ratings agencies spend considerable time and effort investigating potential financial system weakness or instability. Although their approach relies heavily on the specialist knowledge of their financial institutions ratings practices (who, in turn, liaise with the corporate ratings groups), sovereign ratings analysts work independently to corroborate such analysis.

Step 1: Understanding system structure and credit culture

The starting point for the analysis is a survey of the structure of the domestic financial system: overall size of the deposit base and of nongovernment credit in relation to GDP; market shares for the commercial bank, nonbank finance company, money changer, development finance, insurance, pension fund, unit trust, and brokerage segments; the number of banks; the extent of government and foreign shareholding and management control; and ownership linkages between private sector banks and corporations. The extent of directed credit and interest subsidy requirements is noted, as is the presence and nature of any deposit insurance scheme or blanket guarantee. A qualitative assessment of banks' treasury and risk-management practices is made, focusing on the prevalence of collateral- vs. cash flow-based lending and reliance on relationship banking.

Step 2: Assessing regulation and supervision

Domestic prudential norms are compared with global best practice in four principal areas: minimum capital adequacy; loan classification and provisioning; caps on single- and related-party exposures; and ceilings on net open foreign exchange positions. For each area, the frequency of reporting and enforcement is noted, and actual data are compared with requirements. To the extent that they may differ from those for the commercial banks, regulations governing nonbank financial institutions are also surveyed. The staff strength of the relevant supervisory agencies is considered, as is the frequency of on- and off-site inspections and their coverage of accounts by value. Finally, foreclosure rules, bankruptcy legislation, and court processes are discussed with selected institutions, to determine the severity of impediments to collateral recovery.

Step 3: Measuring current asset quality and surveying risk exposure

Regardless of domestic norms, all nonperforming loans (NPLs) are measured on a 90-days-past-due basis, including interest in suspense. In countries with more lenient NPL-recognition standards, 90-days-past-due NPL data at the system level are estimated from NPL data gathered from a representative sample of rated or unrated financial institutions. Similarly, data on general and specific provisioning levels (excluding collateral) are collected from the relevant supervisory authorities and cross-checked against data from selected financial entities. Evidence of large single- or related-party exposures is collected, the extent of banks' real estate and stock market financing is ascertained, signs of “evergreening” activity are investigated, and the sensitivity of borrowers' repayment capacity to interest rate and exchange rate shocks is discussed. Rapid real credit growth is generally viewed as an indicator of declining credit quality.

Step 4: Taking a view on potential recapitalization costs

The peak GPA ratio is derived by adding to current gross NPLs a conservative assumption on incremental problem loans in a “reasonable worst-case scenario”. In such a scenario, it is assumed that the actual gross NPL ratio converges rapidly to the GPA peak while provisions fail to keep pace, resulting in a widening of net NPLs and a drop in capital adequacy. That, in turn, necessitates capital injections, from shareholders in the first instance, but then from the government in its role as final guardian of the domestic deposit base. Determining the share of the recapitalization burden that will devolve upon the government is a difficult judgment involving, *inter alia*, assumptions on the access of foreign-owned banks to the capital bases of their parent institutions.

Sources: Johnston, Chai, and Schumacher (2000); and Karacadag and Manzer (1997).

Table 4. S&P Financial System Asset Quality Classification
(As of October 2001; in percent)

Country 1/	Nongovt. credit/GDP 2/	GPA/GDP		Country 1/	Nongovt. credit/GDP 2/	GPA/GDP	
		Min.	Max.			Min.	Max.
<i>GPA bucket: 5%–15% 3/</i>				<i>GPA bucket: 25%–40% 3/</i>			
Australia	92.5	4.6	13.9	Bolivia	45.9	11.5	18.4
Belgium	90.0	4.5	13.5	Brazil	29.3	7.3	11.7
Canada	69.3	3.5	10.4	Croatia	43.2	10.8	17.3
Denmark 4/	120.0	6.0	18.0	Cyprus	114.5	28.6	45.8
France	94.3	4.7	14.2	Greece	64.4	16.1	25.8
Germany	126.4	6.3	19.0	Korea	95.6	23.9	38.2
Luxembourg	508.4	25.4	76.3	Kuwait	60.9	15.2	24.4
Netherlands	147.7	7.4	22.2	Lebanon	88.4	22.1	35.3
Sweden 4/	107.0	5.4	16.1	Malaysia	101.5	25.4	40.6
Switzerland	158.6	7.9	23.8	Morocco	54.3	13.6	21.7
United Kingdom	138.5	6.9	20.8	Oman	39.5	9.9	15.8
United States	50.3	2.5	7.5	Peru	24.0	6.0	9.6
				Saudi Arabia	28.3	7.1	11.3
				United Arab Emirates	52.7	13.2	21.1
<i>GPA bucket: 10%–20% 3/</i>				<i>GPA bucket: 35%–70% 3/</i>			
Austria	114.0	11.4	22.8	Bulgaria	15.0	5.2	10.5
Chile	65.7	6.6	13.2	China	127.0	44.4	88.9
Finland	58.0	5.8	11.6	Czech Republic	42.4	14.8	29.7
Hong Kong SAR	155.9	15.6	31.2	Egypt	66.7	23.4	46.7
Ireland	139.6	14.0	27.9	India	29.7	10.4	20.8
Italy	81.9	8.2	16.4	Indonesia	20.8	7.3	14.5
New Zealand	117.7	11.8	23.5	Kazakhstan	16.1	5.7	11.3
Norway	72.1	7.2	14.4	Latvia	24.9	8.7	17.5
Portugal	150.5	15.1	30.1	Lithuania	12.1	4.2	8.4
Singapore	120.6	12.1	24.1	Mexico	9.8	3.4	6.9
South Africa	80.0	8.0	16.0	Pakistan	26.0	9.1	18.2
Spain	109.5	11.0	21.9	Romania	9.3	3.2	6.5
<i>GPA bucket: 15%–30% 3/</i>							
Argentina	20.2	3.0	6.1	Russia	16.2	5.7	11.4
Colombia	19.3	2.9	5.8	Slovak Republic	38.3	13.4	26.8
Estonia	27.3	4.1	8.2	Thailand	76.9	26.9	53.9
Hungary	33.8	5.1	10.1	Tunisia	60.5	21.2	42.4
Israel	94.4	14.2	28.3	Turkey	19.7	6.9	13.8
Japan	109.1	16.4	32.7	Venezuela	11.4	4.0	8.0
Panama	115.7	17.4	34.7				
Philippines	37.8	5.7	11.3				
Poland	29.5	4.4	8.8				
Slovenia	40.0	6.0	12.0				
Taiwan Province of China	152.4	22.9	45.7				
Uruguay	54.7	8.2	16.4				

Source: Bugie and others (2001); and IMF staff estimates.

1/ Includes jurisdictions that S&P may consider to be sovereign though not generally classed as such.

2/ Deposit money banks' credit to the private sector and the nonfinancial public sector enterprises, at end-2001.

3/ Peak gross problematic assets (GPAs) as a proportion of domestic nongovernment bank credit in a "reasonable worst-case scenario".

4/ Domestic nongovernment bank credit at end-2000.

7. *Monetary stability*

The monetary stability score aims to capture the sustainability of monetary and exchange rate policies. Scoring guidelines are prescribed in terms of the projected core inflation rate, usually but not always based on consumer prices. Related considerations include: the appropriateness of the exchange rate regime (including some assessment of real exchange rate trends, the import content of the consumer price index and exports, trade performance, and gross international reserves as a proportion of money supply and external debt service); the degree of central bank independence (insulation of the governing board from political pressure, caps on net credit to government, and enforcement mechanisms); the depth of domestic capital markets (deposits and nongovernment credit as a proportion of GDP, credit growth, peak GPAs, and the size and liquidity of domestic bond and equity markets); and the sophistication of monetary instruments (infrastructure for government nonbank borrowing, reliance on reserve requirements, directed credit requirements, price controls, and exchange restrictions).

Each sovereign that adopts a foreign currency as its legal tender or enters into a monetary union, currency board, or other pegged exchange rate arrangement is assigned a monetary stability ramp score related to that of the sovereign or group of sovereigns to which it has relinquished some or all of its monetary policy independence. The extent to which such sovereigns are deemed to have “acquired” the monetary stability of their pegging partners depends on S&P’s assessment of the nature and durability of their arrangements, which, in turn, takes into account their international liquidity ramp scores and other factors. In monetary unions among partners of comparable economic size, the monetary stability score is uniform across all the constituent sovereigns, and reflects a consolidated assessment for the union as a whole.²⁰

To the extent that sovereigns are assessed for their stand-alone monetary stability, the inflation rate is viewed as a comprehensive proxy for monetary policy efficacy, financial stability, and political and institutional effectiveness. Inflationary surges—and hyperinflations in particular—are viewed both as causes and reflections of an underlying erosion of public trust in political institutions, and are often precursors to sovereign debt default.²¹

8. *External flexibility I: liquidity*

The first external score seeks to encapsulate the adequacy of official foreign exchange reserves. Scoring guidelines are prescribed in terms of the projected ratio of the gross

²⁰ This is the case for the European Monetary Union. See Beers, Cavanaugh, and Veverka (1998).

²¹ S&P’s *Sovereign Default Surveys* illustrate the relationship between hyperinflations and defaults on local currency (as well as foreign currency) sovereign debt.

external financing requirement (current account deficit plus principal repayments on long- and short-term debt) to gross usable reserves. The emphasis on usability is important, with reserves estimates excluding foreign exchange earmarked as backing for fixed exchange rate arrangements, deposits held with the foreign branches of domestic banks, reserve accounts linked to structured-finance transactions, net open forward positions, and other encumbered funds. Related considerations include: reserves as a proportion of residual-maturity short-term debt; real export growth; the magnitude of foreign portfolio and direct investment flows; and whether or not the country is a financial center or a “key player” in global trade and financial systems.

Short-term external debt is viewed as a key source of instability. Trade financing and other short-term debt is generally not traded in secondary markets, and is therefore particularly prone to swings in confidence. Attempts are made to track debt by “ultimate obligor”, i.e., debts incurred by the foreign branches or subsidiaries of locally owned banks and companies, in order to include them in the home country’s overall indebtedness.²² Similarly, the ultimate obligations of foreign-owned entities may be deducted from the home country’s indebtedness. Portfolio investment is not viewed as a serious source of capital account vulnerability, given the self-damping nature of its pricing mechanisms. External sector data are usually collected from national authorities and cross-checked against data reported by the IMF and the Bank for International Settlements (BIS).

Arrears are not necessarily treated as short-term debt. In a typical default sequence on a private-creditor debt instrument, the first nonpayment of a debt-service installment triggers the acceleration of all affected interest and principal outstanding, resulting in a rapid widening of arrears. Technically, these arrears are analogous to short-term debt in that they are due immediately; operationally, however, they will be settled through reschedulings, write-downs, or debt-equity swaps after a time-lag. From a liquidity perspective, therefore, it can be misleading to classify arrears as short-term obligations, and gross external financing requirements must be adjusted to reflect expected arrears-settlement patterns.

Introduced in the wake of the Asian crisis, the international liquidity ramp category attempts to gauge reserves adequacy, loosely defined as immunity from disorderly workouts triggered by creditor panic in contagion or other stress scenarios, but also regarded as an important measure of market access. The increased emphasis on liquidity is corroborated by at least one recent study highlighting the ratio of reserves to short-term debt as an important new explanatory variable for the ratings.²³ Comparisons between official sector reserves and private as well as public sector financing requirements reflect more on market confidence than on explicit accounting linkages. Although the debt obligations of the

²² This emerged as a major issue for Korea in late 1997, when the extent of liabilities incurred by the foreign branches of Korean banks became clear.

²³ See Mulder and Perrelli (2001).

private sector are not claims on the financial assets of the central bank *per se*, often private sector leverage may have mounted under the presumption of implicit sovereign support, with the central bank perceived as guarantor of last resort. Import cover and other traditional parameters are used rarely, allowing the analysis to focus on capital account issues in most cases.

9. External flexibility II: public sector net external debt

The second external score aims to measure the strength of the public sector's external balance sheet. Scoring guidelines are prescribed in terms of the projected ratio of public sector net external debt to current account receipts. Gross external debt is defined to include all financial liabilities of the government, the central bank, and the nonfinancial public sector to creditors abroad. Gross external assets are defined to include all financial assets of the government, the central bank, and the nonfinancial public enterprises held abroad.

The public sector external debt score ensures that due emphasis is placed on public sector external leverage, which is viewed as a root cause of exchange rate inflexibility and international liquidity depletion.²⁴ In this context, the longer the maturity of the external debt stock and the greater the extent to which it is denominated in local currency, the lesser the concomitant constraints are viewed to be. "Reds" and finished prospectuses for new cross-border bonds and syndicated loans are gathered and archived as a matter of routine.

10. External flexibility III: bank and private sector net external debt

The third external score seeks to quantify the strength of the bank and corporate sector external balance sheets. Scoring guidelines are prescribed in terms of the projected ratios of financial sector and nonfinancial private sector net external debt to current account receipts. In the case of banks, external liabilities include interbank credit lines and syndicated loans from counterparties abroad, as well as nonresident deposits regardless of currency of denomination, while external assets consist of loans to and deposits with counterparties abroad. In the case of nonbanks, external liabilities consist of direct external borrowing, while external assets may consist largely of flight capital, estimated from BIS data and cumulative capital account residuals where full external balance sheets are unavailable.

As with the public sector external debt score, the bank and corporate sector external debt score examines possible symptoms of real exchange rate imbalance. Sovereigns with financial systems that aggressively pursue externally funded domestic credit growth are penalized,²⁵ as are those that create conditions conducive to large-scale direct external

²⁴ This was illustrated by Pakistan in mid-1998, when a heavy public sector external debt burden constrained the authorities' ability to devalue the rupee in response to exchange market pressures.

²⁵ This was especially the case for Thailand in 1996–97, when real appreciation of the baht was matched by a steady increase in the external liabilities of the domestic financial system.

borrowing by corporate sector entities. Both bank and nonbank private sector external obligations are viewed as potential contingent liabilities of the sovereign.²⁶

D. Debt Sustainability Analysis

The projections upon which S&P, Moody's, and Fitch base their ratings decisions are more akin to debt sustainability simulations than macroeconomic forecasts. Coverage of the real and monetary sectors is limited, with baseline projections for real GDP and domestic prices borrowing heavily from Consensus Economics' *Consensus Forecasts* and IMF medium-term scenarios. Coverage of the fiscal and external sectors, in contrast, is detailed, sometimes to the level of instrument-by-instrument debt documentation. Intersectoral consistency is provided by basic accounting identities. Estimation of financial system asset quality benefits from the experience of each agency's financial institutions ratings practice, together responsible for ratings on thousands of banks worldwide. Where applicable, estimation of usable reserves will increasingly benefit from IMF Special Data Dissemination Standards templates.

Scenario studies are encouraged. Typically, each agency's baseline scenario is a more conservative rendition of government or IMF projections, factoring in modest shortfalls in growth, higher real domestic interest rates, marginal fiscal slippage, and some real currency depreciation. From this starting point, one or more alternate scenarios can be constructed, examining the effects of various assumptions on the key ratios of general government net debt to GDP and general government gross interest payments to revenues, and—crucially—on the budget financing gap (gross financing requirements less identified inflows). The precise combinations of assumptions are left to individual analysts' judgment, subject to scrutiny in committee.

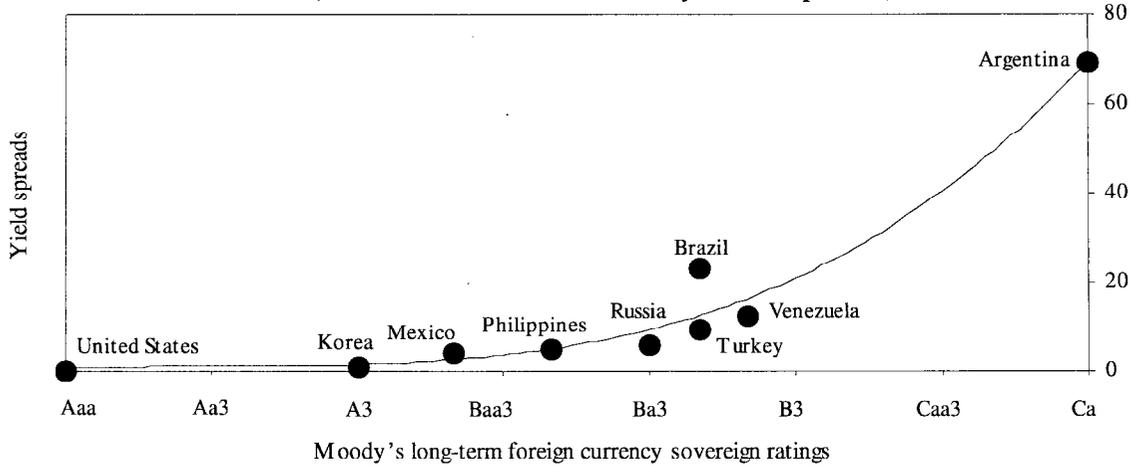
Financing requirements are projected systematically. Revenue projections reflect assumptions on tax buoyancy and fiscal effort. Primary expenditure projections reflect assumptions on spending rigidity and, again, fiscal effort. The resulting projection for the primary balance reflects a clear view on the underlying fiscal stance. Projections for interest payments reflect, *inter alia*, assumptions on the rates at which external debt to private creditors is likely to be refinanced, with secondary market yield spreads on similarly rated sovereign debt used as benchmarks (Figure 2).²⁷ The resulting projection for the overall

²⁶ This was demonstrated by Indonesia's "Frankfurt Agreement" exchange offers in 1998–99, when banking sector external liabilities were swapped for central bank-guaranteed medium-term debt, and by its sovereign exchange rate guarantees for direct corporate sector external debt workouts.

²⁷ There thus exists a formal feedback mechanism by which market information is allowed to affect ratings outcomes.

balance represents the net financing requirement, to which is added amortization falling due, yielding the gross financing requirement.

Figure 2. Benchmark Sovereign Yield Spreads
(U.S. dollar returns as of end-July 2002; in percent)



Sources: J.P. Morgan Chase EMBI+ sovereigns-only yield spread data from Bloomberg L.P.; and Moody's ratings data from Bloomberg L.P.

Financing inflows are analyzed line-by-line. On the domestic side, estimates are made for the expected magnitudes of divestment proceeds, including those from the liquidation of loans and other resolution-trust assets after banking crises; for domestic borrowings from the central bank, financial institutions, and the public; and for nondebt arrears accumulation to suppliers and service providers, if applicable. On the external side, estimates are made for the rollover rates on short-term sovereign debt, and for the expected magnitudes of multilateral, bilateral, and commercial bank loan disbursements and international bond issues. To the extent that a financing gap emerges, it is compared with debt-service commitments to the various classes of creditors, and conclusions are drawn on the likelihood, sequencing, and scope of default.

In stress scenarios, both financing flows to the sovereign and the gross financing requirements of the sovereign may encounter discontinuities. As credit risks mount, rollover rates on private-creditor short-term debt may fall precipitously, embedded put options in private-creditor medium- or long-term debt may be exercised *en masse*,²⁸ and the sovereign may find itself cut off from debt financing in the international primary market. At the same time, defaults by subsovereign issuers may multiply, triggering the widespread

²⁸ See Beers, Bhatia, and Chambers (1999). In its liquidity analysis, S&P treats the first upcoming put option as the effective maturity date for all debt instruments issued by sovereigns rated in the 'B' category or below.

calling of sovereign guarantees, even as financial system distress may result in a large-scale crystallization of contingent liabilities on to the sovereign balance sheet.

The experience of the Asian crisis underscored the extent to which information risk and concealed fiscal imbalance can mask the true nature of a sovereign debt trajectory.

Associated analytical challenges include not only the accurate estimation of contingent liabilities, but also a judicious understanding of the conditions under which such liabilities may surface as a source of macroeconomic instability and debt-service pressure. Given the complexity of such judgments, the ratings agencies' debt sustainability scenarios focus more on deterministic "stress testing" of rated sovereigns under "reasonable worst-case" assumptions than on attempting strenuously to forecast actual medium-term outcomes.

The invisible ingredient in the ratings process is the committee deliberation. It is in the cut and thrust of internal debate that sovereign analysts convert ramp scores and checklists into credit ratings opinions. In the case of S&P, to the extent that an analyst's vote on a rating diverges from that implied by the aggregate ramp score sequence, it represents an implicit weighting of ramp scores, with shifting weights determined by sovereign-specific factors and individual judgment. One important consideration not captured explicitly in the ramp is an assessment of the quality and timeliness of policy responses in stress scenarios. Another is willingness—as distinct from capacity—to honor debt. Yet others may include special emphasis on geopolitical risk, or the "clear and present" risks that arise when a sovereign is already in arrears to suppliers or official creditors.

In each committee, S&P analysts are expected first to separate the discussion into separate ramp categories, and then to assimilate an overall view. Although discussed in sequence, ramp scores are not mutually independent. The score for economic growth prospects, for instance, will depend in part on the score for economic structure. Similarly, the score for monetary stability may rest to a large extent on the score for international liquidity, or vice-versa. The process by which S&P, Moody's, and Fitch capture such dynamic is analogous to the monetary policy committee deliberations of many central banks, with emphasis on individual members' experience and accountability, reinforced by comparatives and other check and balances.

Analysts are reminded to be forward-looking, and to be alert for possible discontinuities between past track records and future trends. Sovereigns with default histories—whether an isolated default or a string of recurring defaults—are not automatically penalized, because the effort is to base ratings on perceived causes, not symptoms, of credit risk; ratings are not punitive. The ratings-agency approach differs markedly, in this respect, from the "signals approach" to vulnerability, which seeks to identify lead correlations with, rather than causation for, sovereign default and other measures of balance of payments crisis.²⁹ The need to be forward-looking has been brought further into focus in recent years as

²⁹ See Berg and others (2000).

rated sovereign bonds have begun to default, with the agencies seeking to satisfy market demand for differential assessments of the relative credit standing of old vs. new debt instruments. Unlike default histories, however, policy predilections are emphasized, with discussion often centering around intangible issues such as a government's propensity for "orthodox" vs. "heterodox" policy responses when under acute debt-service pressure.

E. International Creditor Hierarchies and Selective Default

When national governments are confronted by financing gaps that cannot be bridged through taxation, expenditure restraint, voluntary borrowing, and other conventional means, they can choose more coercive deployments of sovereign power and immunity. Government responses to situations of extreme stress often begin with heightened domestic financial repression in the form of new or tightened exchange and capital controls, quantitative import-compression measures, and requirements on financial institutions to purchase government securities. Such policies often succeed in narrowing financing gaps and staving off sovereign default in the short run, but do so at considerable political and economic cost.

As domestic financial repression approaches the limits of political and economic tolerance, governments typically begin to turn their attention towards their external creditors. The costs and benefits of arrears accumulation are assessed creditor-by-creditor, taking into account such factors as the expected likelihood, terms, and timeline of new debt inflows, the financial and reputational damage of default, and vulnerability to litigation. Overlapping political, strategic, and legal considerations come together in the formulation of a selective default plan favoring some creditors over others. Sovereign default comes not as an accident, but as a willful policy decision, viewed by the debtor government as a politically less onerous strategy than the other alternatives available.

A sovereign default will typically be preceded by the accumulation of debt-service arrears to bilateral aid agencies and export-import banks, widely perceived as the "softest" category of external creditors.³⁰ If the resulting cashflow savings bridge the financing gap, then the sovereign eventually enters into negotiations with the IMF in order to agree a policy program with upper-credit-tranche conditionality, a precondition for most bilateral arrears regularization deals. Conversely, if the cashflow savings resulting from bilateral arrears accumulation fail to bridge the financing gap, the distressed debtor government will typically widen its arrears to affect any syndicated loans it may have drawn from commercial banks, often perceived as relationship lenders susceptible to moral suasion. Arrears to international bondholders and multilateral creditor institutions are usually regarded as the penultimate and ultimate options, respectively, because of the higher attendant costs.

³⁰ Sovereign default here refers to the ratings-agency definition, which includes debt restructurings "in the shadow of default".

The *de facto* seniority of multilateral lenders is a product of consensual action by the world's major creditor governments. Since 1956, an informal grouping of such governments, currently 19 strong, has joined together in the Paris Club, a credit cartel that negotiates debt-restructuring agreements with financially distressed sovereigns. To safeguard against circular resource flows from participating creditors to the debtor and on to nonparticipating creditors, the Paris Club abides by what it refers to as the “comparability-of-treatment principle”. The agreed minute of each Paris Club debt deal will include a best-efforts undertaking by the debtor to seek from nonparticipating creditors debt relief on terms at least as favorable as those agreed by the Paris Club. The stipulation does not apply to the IMF, the World Bank, and other key multilateral creditors, and it is this exclusion that forms the basis for their “preferred” creditor status.

In addition to grace periods, interest rates, and phasing on rescheduled amounts, each Paris Club agreed minute also lays down criteria for which debts are eligible for treatment and which are not. Only debt-service payments falling due during a specified “consolidation period” are eligible, with some deals covering principal only and others including interest. The Paris Club usually requires that each recipient sovereign be engaged in an IMF program with upper-credit-tranche conditionality for the duration of its consolidation period, on the grounds that debt relief must be supported by underlying policy correctives. Only payments on debt contracted before a specified “cutoff date” are eligible, with “post-cutoff date” debt enjoying seniority. The cutoff date typically reflects either a political watershed or the onset of an economic crisis, on the grounds that new loans can be provided only if it is reasonably assured that they will be honored in full and on time.

In principle, Paris Club burden sharing is applied to all debt-service streams to nonparticipating creditors (excluding preferred creditors) that meet the eligibility criteria laid down for participating-creditor debt. Such stipulations have been applied to non-Paris Club bilateral debt and sovereign bank loans for decades, as a matter of routine. It was not until 1999, however, that international bonds were ensnared for the first time, with Pakistan launching a sovereign Eurobond exchange 289 days after it signed a Paris Club deal (Box 4). Coming six months ahead of a Paris Club agreement with Russia, the fourth-largest issuer of sovereign international bonds, the Pakistan deal generated considerable market interest.

The *de jure* and *de facto* seniority of international bondholders, to the extent that it exists, is a product of the legal structure of bond covenants and defensive action by the world's major banks. The fundamental reason why a bond is more difficult to restructure than a loan relates to creditor coordination problems. Whereas cross-border syndicated loans are typically contracted from 10–50 creditor banks—many of which may be branches or subsidiaries of common parent institutions—international bond issues may be held by hundreds if not thousands of retail as well as institutional investors. Most bond covenants exclude majority restructuring provisions but include cross-default clauses, further complicating the inherently complex process of bond reprofiling. As cross-border bonds emerged as the largest emerging markets asset class during the 1990s, incentives to further insulate them from default mounted.

Box 4. Selected Sovereign Defaults, 1998–2000

Pakistan, 1998–99

- Pakistan's sovereign default cycle began on May 29, 1998 with a unilateral central bank directive converting \$79 million of foreign currency bearer certificates, issued domestically and held by domestic retail investors, into local currency instruments. The default widened from July 1998 to affect foreign currency trade credits and medium-term loans with an aggregate principal amount of \$1.4 billion, drawn from foreign and domestic banks.
- On January 30, 1999, Pakistan signed a Paris Club agreement treating \$3.2 billion of participating-creditor debt. On November 15, 1999, it launched a coercive Eurobond exchange in which three trust deed instruments with an aggregate face value of \$608 million, held mostly by foreign banks, were replaced by one new trust deed instrument with a face value of \$620 million. On November 16, S&P indicated that the new Eurobond would be rated in the 'B' category, even as it downgraded the three Eurobonds eligible for the exchange to 'D'. A sovereign-guaranteed Eurobond issued by the Pakistan Telecommunications Corporation Limited, with a face value-at-issue of \$250 million, was excluded from the burden-sharing requirement on the grounds that it is a future-flows structured transaction.
- Pakistan's default cycle concluded with the signing on December 12, 1999 of the "Pakistan Trade Maintenance Agreement" restructuring \$929 million of arrears to commercial bank creditors into new foreign currency loans of identical amount, and the issuance of the new Eurobond on December 13.

Russia, 1998–2000

- Russia's sovereign default cycle began on August 17, 1998 with the unilateral imposition of a debt-service moratorium on Ru 281 billion (\$36.3 billion) of local currency Treasury bills ("GKOs" and "OFZs"), of which about 30 percent was held by foreign investors. The default widened on December 29, 1998 when Russia extended its moratorium to include foreign currency principal notes ("Prins"), interest arrears notes ("Ians"), and past-due-interest notes ("PDIs") with an aggregate face value of \$29.8 billion, issued domestically but held mostly by foreign investors. Finally, on May 14, 2000, Russia failed to repay \$1.3 billion of principal on MinFin Series III foreign currency bonds, issued domestically and held mostly by domestic investors.
- On August 1, 1999, Russia signed a Paris Club agreement treating \$8.1 billion of participating-creditor debt. Its large Eurobond stock, a multitude of instruments with an aggregate face value of about \$20 billion, was not subject to comparability of treatment because all issues were launched after its cutoff date of January 1, 1991, set in a previous Paris Club deal in 1993 to mark the transition of the USSR into the Russian Federation.
- On February 11, 2000, Russia exchanged its defaulted GKOs and OFZs for Ru 148 billion (\$6 billion) of new GKOs and OFZs. On July 27, 2000, S&P assigned a prospective rating of 'B-' to two new Eurobonds proposed to be issued by Russia in exchange for its defaulted Prins, Ians, and PDIs; the exchange concluded on August 25, 2000 with the issuance of new instruments with an aggregate face value of \$18.4 billion. Russia's default cycle concluded with the exchange on November 30, 2000 of its defaulted MinFins for \$865 million of new foreign currency bonds and Ru 8.8 billion (\$336 million) of new local currency bonds, both issued domestically; on December 8, S&P assigned ratings of 'CCC+' and 'B-', respectively, to the two new securities.

Ecuador, 1999–2000

- Ecuador's sovereign default cycle began on August 26, 1999 when it announced its intention to restructure four Brady bonds with an aggregate face value of \$6.0 billion and two Eurobonds with an aggregate face value of \$500 million. The default widened on October 9, 1999 with a unilateral restructuring of \$346 million of foreign currency debt, issued domestically and held mostly by domestic banks.
- In early 2000, Ecuador approached S&P for senior unsecured debt ratings on two global bonds proposed to be issued in exchange for its defaulted Brady bonds and Eurobonds. The offer was launched on July 27, 2000, and S&P assigned a prospective rating of 'B-' to the proposed new instruments on July 31. The exchange, and Ecuador's default cycle, concluded on August 23, 2000 with the issuance of new global bonds with an aggregate face value of \$3.9 billion.

Sources: IMF (2001); and S&P (1997–2002 various).

“Concerted” bond restructurings such as the Pakistan exchange have generated strong resistance from private creditors, which viewed them as small but important test cases. Intensive lobbying of creditor governments, backed by arguments on the possible adverse effects on emerging markets financing of Paris Club-induced bond defaults, met with considerable success.³¹ In its Prague Declaration of September 2000, the International Monetary and Financial Committee of the IMF asserted that the framework for private sector involvement “must rely as much as possible on market-oriented solutions and voluntary approaches”, effectively allowing the Paris Club to retain a high degree of operational flexibility.

The case-by-case application of Paris Club burden-sharing stipulations creates new challenges for the ratings agencies. In addition to measuring the risk of selective and general defaults driven by first-round financing shortfalls, S&P, Moody’s, and Fitch sovereign analysts must also assess the risk of selective defaults on individual debt instruments driven by second-round burden-sharing stipulations, and must now do so in the absence of a rules-based policy framework. Increasingly, sovereign ratings analysts must track Paris Club cutoff dates, consolidation periods, and other details, and assess their possible implications for individual bank loans and bond issues. Unable to second-guess Paris Club policy, the ratings agencies strive to maintain contacts with decision makers in various official-creditor bodies, in order to monitor positions on comparability of treatment as they evolve.

F. Local Currency Sovereign Ratings

S&P, Moody’s, and Fitch ratings committees vote on local currency as well as foreign currency sovereign and senior unsecured debt ratings. In the case of S&P, of the 93 sovereigns it rated as of end-July 2002, 91 had local currency ratings in the public domain (Table 5). Of these 91 sovereigns, 51 had local currency ratings that were one to four notches higher than their foreign currency ratings. The judgment that a sovereign enjoys superior credit standing on its local currency debt than on its foreign currency debt reflects a positive assessment of its ability to tax and borrow from its domestic economy on a sustainable basis and, in extreme circumstances, to repress the domestic financial system, issue currency, and levy *seignorage*.³²

³¹ See IMF (2000); and IMF (2001).

³² S&P’s *Sovereign Default Surveys* underscore the relative infrequency of sovereign defaults on local currency debt vs. those on foreign currency debt.

Table 5. S&P Local and Foreign Currency Sovereign Ratings and Outlooks
(As of end-July 2002)

Country 1/	LT FC sov. rtg.	LT LC sov. rtg.	LC-FC notching	Country 1/	LT FC sov. rtg.	LT LC sov. rtg.	LC-FC notching
<i>Investment grade</i>				Mexico	BBB-	A-	3
Austria	AAA	AAA	...	Slovak Republic	BBB- ↑	A-	3
Canada	AAA	AAA	...	South Africa	BBB-	A-	3
Denmark	AAA	AAA	...	Thailand	BBB-	A-	3
Finland	AAA	AAA	...	Trinidad and Tobago	BBB- ↑	BBB+ ↑	2
France	AAA	AAA	...	Croatia	BBB-	BBB+	2
Germany	AAA	AAA	...	<i>Speculative grade</i>			
Ireland	AAA	AAA	...	Philippines	BB+	BBB+	3
Isle of Man	AAA	AAA	...	Egypt	BB+	BBB	2
Liechtenstein	AAA	AAA	...	El Salvador	BB+	BB+	...
Luxembourg	AAA	AAA	...	Colombia	BB ↓	BBB ↓	3
Netherlands	AAA	AAA	...	Morocco	BB ↓	BBB ↓	3
Norway	AAA	AAA	...	India	BB ↓	BBB- ↓	2
Singapore	AAA	AAA	...	Kazakhstan	BB ↑	BB+ ↑	1
Switzerland	AAA	AAA	...	Costa Rica	BB	BB+	1
United Kingdom	AAA	AAA	...	Guatemala	BB	BB+	1
United States	AAA	AAA	...	Panama	BB	BB	...
Australia	AA+	AAA	1	Jordan	BB-	BBB-	3
New Zealand	AA+	AAA	1	Peru	BB-	BB+	2
Sweden	AA+ ↑	AAA	1	Bulgaria	BB-	BB	1
Belgium	AA+	AA+	...	Vietnam	BB-	BB	1
Spain	AA+	AA+	...	Belize	BB- ↓	BB ↓	1
Bermuda	AA	AA	...	Dominican Republic	BB-	BB-	...
Italy	AA	AA	...	Grenada	BB-	BB-	...
Portugal	AA	AA	...	Russia	BB-	BB-	...
Taiwan Province of China	AA ↓	AA ↓	...	Bolivia	B+	BB	2
Japan	AA-	AA-	...	Brazil	B+ ↓	BB ↓	2
Iceland	A+ ↓	AA+ ↓	3	Jamaica	B+	BB-	1
Hong Kong SAR	A+	AA-	1	Romania	B+	BB-	1
Kuwait	A	A+	1	Senegal	B+	B+	...
Slovenia	A	AA	3	Papua New Guinea	B	BB-	2
Cyprus	A	AA-	2	Paraguay	B ↓	BB- ↓	2
Malta	A	AA-	2	Mongolia	B ↑	B ↑	...
Botswana	A	A+	1	Cook Islands	B	B	...
Greece	A ↑	A ↑	...	Ukraine	B	B	...
Chile	A- ↑	AA	4	Uruguay	B ↓	B ↓	...
Bahrain	A-	A	1	Venezuela	B ↓	--	--
Barbados	A-	AA-	3	Pakistan	B-	B+	2
Czech Republic	A-	AA-	3	Suriname	B-	B	1
Israel	A- ↓	AA- ↓	3	Lebanon	B- ↓	B- ↓	...
Hungary	A-	A+	2	Turkey	B- ↓	B- ↓	...
Korea	A-	A+	2	Ecuador	CCC+	CCC+	...
Qatar	A- ↑	A ↑	1	Indonesia	SD	B- ↓	--
Estonia	A-	A-	...	Argentina	SD	SD	--
Poland	BBB+	A	2				
Malaysia	BBB ↑	A ↑	3				
Tunisia	BBB	A	3				
Latvia	BBB ↑	A-	2				
Lithuania	BBB	BBB+	1				
Oman	BBB	BBB+	1				
China	BBB	--	--				

Source: S&P (2002).

1/ Includes entities that S&P may consider to be sovereign governments though not generally classed as such.
Abbreviations: LT = Long-term
FC/LC = Foreign currency/Local currency
Sov. rtg. = Sovereign rating
↑/↓ = Outlook
Stable outlook unless otherwise noted
-- = Not rated or not applicable

Two approaches to the local vs. foreign currency ratings “notching” of sovereigns can be identified. The first, best characterized as a “notch-up” approach, views foreign currency ratings as the fundamental measure of sovereign credit standing, and the markup of local currency ratings as a function of domestic debt-market development and other factors specific to local currency creditworthiness. The second, a “notch-down” approach, views local currency ratings as the anchor, and the markdown of foreign currency ratings as a function of foreign exchange constraints. The notch-up approach would imply that wide notching is consistent with relatively strong assessments for fiscal flexibility and monetary stability, while the notch-down approach would imply that it is consistent with relatively weak assessments for external flexibility. In practice, elements of both approaches are used.

The differential between a government’s local and foreign currency creditworthiness is viewed, above all, as a function of its monetary policy independence. Sovereigns that maintain floating exchange rate regimes and fund modest borrowing requirements from relatively deep domestic financial markets will generally have the widest notching. Sovereigns that have opted for dollarization or monetary union backed by appropriate fiscal policies may enjoy higher ratings overall, but will generally have no notching. At the top of the ratings scale, notching is constrained naturally as foreign currency ratings approach ‘AAA’ or ‘Aaa’. At the bottom, sovereigns can have local currency issuer ratings of ‘SD’ or ‘D’ even as they continue to honor their foreign currency debt.

General default on local currency debt is regarded as a highly destructive policy option, damaging to the domestic banking and payments systems, detrimental to external as well as domestic confidence, and almost always leading to default on foreign currency debt as well. Defaults such as that by Kuwait in 1990–91, on its entire stock of local currency debt while foreign currency debt was honored in full, are viewed as exceptional. Defaults such as that by Russia in 1998, on its entire stock of local currency debt from August followed by selected foreign currency debt instruments from December, are viewed as more typical. Hyperinflations, such as that in Argentina in 1989–90, are key risk factors for local currency sovereign default, as are political and institutional breakdowns more generally.

III. RATINGS FAILURE

A. Sovereign Defaults and Corporate Default Probabilities

Any rigorous assessment of ratings quality must start from the premise that ratings seek to forewarn of sovereign default, not balance of payments crisis or other related vulnerabilities. The first-best approach to studying ratings quality would, therefore, involve testing ratings against actual sovereign defaults. This approach is followed by the corporate ratings practices of S&P, Moody’s, and Fitch, all of which have published corporate default studies with multi-year default rates calculated by ratings category.³³ The technique followed

³³ See Ammer and Packer (2000); Bos and Brady (2002); Hamilton (2002); and Mah and Verde (2001).

by all three agencies involves sorting rated corporate entities at the beginning of each year into “static pools” by rating level and then tracking the number of defaulters in each pool. The composition of each pool remains constant over time.³⁴ Default rates are calculated as the cumulative number of new default observations divided by the number of obligors in the pool, with the process repeated over a range of time horizons. Default probabilities for the sample period as a whole are calculated by averaging the default rates of individual pools, one time horizon at a time, with the process repeated all along the ratings scale. Formulaically, the two-step technique is summarized below.

Step 1. Calculate default rates, $(d_{R,y})_T$, for each rating-specific static pool over each time horizon:

$$(d_{R,y})_T = \frac{\sum_{t=1}^T (D_{R,y})_t}{N_{R,y}} \quad (\text{Equation III.A.1a})$$

where R denotes the initial rating level of the static pool, y denotes the year of formation of each static pool, T denotes the outer-bound time horizon of the default rate in years, D denotes the number of new default observations, t denotes time elapsed since the formation of the static pool in years, and N denotes the population of the static pool.

Step 2. Calculate default probabilities, $\rho(d_R)_T$, for each rating over each time horizon:

$$\rho(d_R)_T = \frac{\sum_{y=1}^Y (d_{R,y})_T}{Y} \quad (\text{Equation III.A.1b})$$

with $Y \leq S - T + 1$

where Y denotes the total number of annual static pools in the sample at the given rating level, and S denotes the sample size in years.³⁵

Corporate default probabilities are calculated from ratings on thousands of obligors (Table 6). S&P’s latest corporate default survey as of end-July 2002 was based on a 1981–2001 sample period, 9,769 rated obligors, and an undisclosed number of default observations. Moody’s survey was based on a 1970–2001 sample period, “over 16,000” rated obligors, and “over 3,500” default observations. Fitch’s survey—its first ever—was based on a 1990–2000 sample period, 2,639 rated obligors, and 49 default observations. S&P and Moody’s publish corporate default probabilities at the fine level of ratings (i.e., with ‘+/-’ or

³⁴ S&P also publishes default rates for “adjusted” static pools, where the population of each pool may shrink as some obligors cease to be rated in the wake of default and bankruptcy. The analysis here confines itself to unadjusted static pools.

³⁵ In some years, there may be no sovereigns rated at a given starting level on the first day of the year, and thence no static pool for that rating.

ordinal qualifiers), and Fitch at the coarse level of ratings categories (i.e., without qualifiers). S&P publishes default probabilities for time horizons of one to 15 years, Moody's for one to ten years, and Fitch for one to five years, all at annual increments. At the coarse level of ratings categories, the interagency correlations of five-year corporate default probabilities published in 2001–02 is S&P:Moody's 0.9996, S&P:Fitch 0.8858, and Moody's:Fitch 0.8812.

Table 6. Ratings Categories and Corporate Default Probabilities Compared
(As of end-July 2002)

S&P		Moody's		Fitch	
Rating category	5-year default probability 1/	Rating category	5-year default probability 2/	Rating category	5-year default probability 3/
<i>Investment grade</i>	<i>0.88%</i>	<i>Investment grade</i>	<i>0.90%</i>	<i>Investment grade</i>	<i>0.44%</i>
AAA	0.10%	Aaa	0.14%	AAA	0.00%
AA	0.26%	Aa	0.31%	AA	0.15%
A	0.57%	A	0.51%	A	0.15%
BBB	2.16%	Baa	1.95%	BBB	1.58%
<i>Speculative grade</i>	<i>19.48%</i>	<i>Speculative grade</i>	<i>20.98%</i>	<i>High yield</i>	<i>7.34%</i>
BB	10.59%	Ba	11.42%	BB	4.55%
B	25.06%	B	31.00%	B	2.37%
CCC, CC or C	46.87%	Caa, Ca or C	56.82%	CCC, CC or C	45.65%

Sources: Bos and Brady (2002); Hamilton (2002); and Mah and Verde (2001).

1/ Calculated from the incidences of default within five years of static pools of corporate issuers rated at the applicable starting level on the first day of each year, averaged for all such pools in the 1981–2001 period. Covers 9,769 rated obligors and an undisclosed number of default observations.

2/ As for S&P, but with a 1970–2001 sample period. Covers over 16,000 rated obligors and 3,500 default observations.

3/ As for S&P, but with a 1990–2000 sample period. Covers 2,639 rated obligors and 49 default observations.

Corporate default data indicate that, on average, 3–5 percent of speculative-grade corporate issuers default within one year, 7–14 percent within three years, and 7–21 percent within five years. For all three time horizons, the lower-bound default probability is from Fitch, which also finds some irregularities in its probability distribution, with higher default probabilities for issuers rated in the 'BB' category than for those in the 'B' category, for instance. The fact that Fitch's corporate default probabilities correlate less well with those of S&P and Moody's than do S&P's and Moody's probabilities with each other may be explained by Fitch's shorter ratings history and smaller sample size, and does not necessarily point to weaknesses in Fitch's ratings methodology.

Efforts to apply corporate default survey techniques to the sovereign sector are hampered by insufficient sample size. Modern sovereign ratings and cross-border bond markets are phenomena of the post-IET period. During that period, many sovereigns opted to be rated, and several opted to default. But—importantly—very few sovereigns defaulted after opting to be rated. In 1998 Ukraine became the first rated sovereign to default on international bonds (defined here as bonds governed by foreign law and subject to the

jurisdiction of foreign courts) since the withdrawal of the IET in 1974. It was followed by Pakistan and Ecuador in 1999, by Argentina in 2001, and by Moldova in 2002. Thus, as of end-July 2002, only five sovereigns had entered into default on international bonds while rated by either S&P or Moody's or both (Table 7).³⁶ Of the five, all but one (Ukraine) had a credit rating at least 12 months prior to default. Long-term foreign currency ratings one year prior to default were in the speculative grade in all cases, and ranged from 'BB' (S&P on Argentina) to 'B3' (Moody's on Moldova).

Table 7. International Bond Defaults by Rated Sovereigns, 1975–2002 1/
(As of end-July 2002)

Country	Rated since		Amount 4/	Default 2/	Period	Rating 3/	
	S&P	Moody's				S&P	Moody's
Argentina	Aug. 25, 1993	Nov. 18, 1986	\$94 bn.		Nov. 6, 2001 (ongoing)	BB-	B1
Ecuador	July 29, 2000	July 24, 1997	\$6.5 bn.		Aug. 26, 1999 – Aug. 23, 2000	--	B3
Moldova	--	Jan. 14, 1997	\$40 mn.		June 13, 2002 (ongoing)	--	Caa1
Pakistan	Nov. 21, 1994	Nov. 23, 1994	\$608 mn.		Jan. 30, 1999 – Dec. 13, 1999	CC	Caa1
Ukraine	Dec. 21, 2001	Feb. 6, 1998	\$1.7 bn.		Aug. 30, 1998 – Mar. 14, 2000	--	--

Sources: Beers and Bhatia (1999); IMF (2001); IMF (2002); Levey (2002); and S&P (2002).

1/ International bonds here refer to bonds governed by foreign law and subject to the jurisdiction of foreign courts, typically in major international issuance jurisdictions such as England, Germany, Japan, Luxembourg, and New York.

2/ Default here refers to the ratings-agency definition, which includes debt restructurings "in the shadow of default".

3/ Long-term foreign currency sovereign rating on the first day of the year of entry into default.

4/ Approximate face value of affected underlying principal (as opposed to amount of debt service in arrears). Amount for Argentina includes international bonds with an aggregate face value of \$41 billion restructured in the Phase One exchange launched on Nov. 6, 2001.

Abbreviation: -- = Not rated or not applicable.

Sovereign international bond defaults in 1998–2002 affected a variety of instruments. Ukraine restructured four Eurobonds with an aggregate face value of \$1.7 billion, three of which were issued under Luxembourg law, and one under German law. Pakistan restructured three Eurobonds with an aggregate face value of \$608 million, all issued under English law. Ecuador missed payments on and subsequently restructured four Brady bonds with an aggregate face value of \$6 billion and two Yankee bonds with an aggregate face value of \$500 million, all issued under New York law. Argentina had by end-July 2002 restructured or missed payments on a multitude of international bonds with an aggregate face value of about \$94 billion, issued under New York and various other foreign laws. Finally, Moldova missed payments on a \$40 million Eurobond, issued under English law, and had by end-July 2002 come close to finalizing a restructuring agreement for the distressed instrument.

³⁶ See Levey (2002); and S&P (2002). Fitch's sovereign ratings history is not readily accessible.

Table 8. Sovereign Default Rates, 1998–2002
(As of end-July 2002; in percent)

	Sovereign 1-yr. default rates 1/					Sovereign	Corporate
	1998	1999	2000	2001	2002	1-yr. default probability 2/	1-yr. default probability 3/
S&P							
<u>Investment grade</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.10</u>
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.00	0.00	0.00	0.01
A	0.00	0.00	0.00	0.00	0.00	0.00	0.05
BBB	0.00	0.00	0.00	0.00	0.00	0.00	0.26
<u>Speculative grade</u>	<u>0.00</u>	<u>3.57</u>	<u>0.00</u>	<u>3.03</u>	<u>0.00</u>	<u>1.32</u>	<u>4.72</u>
BB	0.00	0.00	0.00	7.14	0.00	1.43	1.22
B	0.00	0.00	0.00	0.00	0.00	0.00	5.96
CCC, CC or C	0.00	33.33	0.00	0.00	0.00	6.67	24.72
Moody's							
<u>Investment grade</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.06</u>
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.02
A	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Baa	0.00	0.00	0.00	0.00	0.00	0.00	0.15
<u>Speculative grade</u>	<u>0.00</u>	<u>5.13</u>	<u>0.00</u>	<u>2.56</u>	<u>2.50</u>	<u>2.04</u>	<u>4.73</u>
Ba	0.00	0.00	0.00	0.00	0.00	0.00	1.27
B	0.00	5.56	0.00	5.00	0.00	2.11	6.66
Caa, Ca or C	0.00	100.0	0.00	0.00	16.67	23.33	21.99

Sources: Beers and Bhatia (1999); Bos and Brady (2002); Hamilton (2002); IMF (2001); IMF (2002); Levey (2002); and S&P (2002).

1/ Rated sovereigns entering into international bond default during each year as a proportion of sovereigns rated at the applicable starting level on the first day of each year. Default and international bonds defined as in Table 7. S&P's sample covers 90 rated sovereigns and two default observations (Pakistan in 1999 and Argentina in 2001). Moody's sample covers 109 rated sovereigns and four default observations (Pakistan and Ecuador in 1999; Argentina in 2001; and Moldova in 2002); Ukraine's default in 1998 is excluded because Ukraine was unrated on the first day of 1998.

2/ Average of sovereign one-year default rates for 1998–2002.

3/ Average of corporate one-year default rates. S&P covers the 1981–2001 period, 9,769 rated obligors, and an undisclosed number of default observations. Moody's covers the 1970–2001 period, over 16,000 rated obligors, and over 3,500 default observations.

The application of corporate default survey techniques to five sovereign international bond defaults yields a matrix of limited validity. This paper calculates sovereign default rates for 1998–2002, the only period since 1974 to include observations of international bond default by rated sovereigns (Table 8). Reflecting data constraints, the analysis attempted here is restricted in three ways: default rates are calculated at the coarse level of ratings categories (i.e., without '+/-' or ordinal qualifiers); default rates are calculated over a one-year time horizon only; and default observations cover international bonds only. The resulting sovereign default probabilities suggest that, on average, about 1.5–2 percent of speculative-grade rated sovereigns default on international bonds within one year. In comparison, corporate default probabilities suggest that, on average, 3–5 percent of speculative-grade rated corporate entities default on any type of commercial debt within one year.

The fact that this paper's sovereign default probabilities are about half as large as those for the corporate sector does not necessarily imply that sovereign ratings are too harsh.

As is emphasized by the ratings agencies, modern sovereign cross-border bond markets remain relatively young, and defaults are only now beginning to occur. Pointing out that new sovereign ratings activity since the mid-1990s has been concentrated in the speculative grade and that bond issuance by speculative-grade rated sovereigns has been growing, S&P, Moody's, and Fitch all argue that the frequency of sovereign bond defaults will increase in the years ahead. Their argument is supported by historical data, which suggest that the absence of international bond defaults by rated sovereigns in 1975–97 may have been a transient phenomenon. Sovereign one-year default probabilities calculated based on a 1975–2002 sample period (including 23 years with no default observations) would suggest that only 0.2–0.4 percent of speculative-grade rated sovereigns default on international bonds within one year, compared with 1.5–2 percent based on our 1998–2002 sample period.

Sovereign default probabilities will remain statistically not meaningful until more default experience has accumulated. Until then, it will not be possible to test definitively the ratings agencies' assertion that sovereign and corporate default probabilities are on converging trajectories. In the interim, studies of sovereign international bond defaults could be broadened to also cover defaults on cross-border foreign currency bank loans, foreign currency bonds governed by domestic law, and local currency debt. Argentina and Pakistan, for instance, both defaulted on syndicated loans (as well as international bonds) during 1998–2002, as did Indonesia during the same period. Similarly, Argentina, Ecuador, and Pakistan all defaulted on domestically issued foreign currency bonds during 1998–2002, as did Russia in 1998–2000 and Venezuela in 1995–97. Argentina and Russia also defaulted on local currency debt during 1998–2002.³⁷ An exhaustive sovereign default study is not attempted here. Instead, this paper now turns to the subject of ratings stability.

B. Ratings Failure Defined and Observed

S&P, Moody's, and Fitch are often criticized for their failure to adequately forewarn of crises and, when crises occur, for precipitous ratings downgrades that exacerbate already stressed situations. Equally, the agencies are often criticized for their failure to upgrade ratings adequately in the wake of crises. The externalities of sovereign credit ratings—issues

³⁷ Ecuador unilaterally restructured \$346 million of domestic debt on October 9, 1999. Pakistan unilaterally restructured \$79 million of "Foreign Currency Bearer Certificates" and "Dollar Bearer Certificates" on May 29, 1998, and missed payments on about \$1.4 billion of syndicated loans commencing in mid-July 1998. Indonesia restructured \$1.85 billion of syndicated loans commencing on September 23, 1998. Russia unilaterally imposed debt-service moratoria on Ru 281 billion (\$36.3 billion) of local currency "GKOs" and "OFZs" on August 17, 1998, on \$29.8 billion of "Prins", "Ians", and "PDIs" on December 29, 1998, and on \$1.3 billion of "MinFins" on May 14, 2000. Venezuela selectively missed payments on about \$635 million of "Bonos Residentes" between late 1995 and early 1997.

such as the extent to which they affect capital flows and yield spreads—are beyond the scope of this paper.³⁸ Conversely, issues of when, why, and to what extent the agencies fail to forewarn of crises, and whether they suffer from a “once burnt, twice shy” syndrome and shun post-crisis upgrades, are integral to a critique of their definitional frameworks, decision-making processes, and analytical methodology.

Sovereign ratings failure can be defined in many ways. Ideally, ratings would be judged by their deviations from a true underlying measure of creditworthiness. If it were possible to ascertain the true probability of default of a sovereign debt instrument, then that probability could be compared with the default probabilities implied by the credit ratings of S&P, Moody’s, and Fitch. Prospects for back-testing are limited by the small number of defaults, to date, on rated sovereign debt instruments. Prospects for forward-looking testing are limited by the lack of a proven superior method of predicting sovereign default risk. Other approaches to sovereign risk assessment do exist, but whether or not they outperform the ratings agencies’ methodologies to the extent that they can usefully generate an underlying latent variable is beyond the scope of this paper.

In the absence of a robust measure of “true” creditworthiness, the next-best approach to measuring ratings failure may be one based on ratings stability.³⁹ Any downgrade or upgrade marks an acceptance by the concerned agency that its earlier rating was, or has become, inappropriate. Taking this a step further, ratings instability in excess of some threshold may be defined as indicative of failure, resulting in the generation of a binary “true-or-false” signal. The parameters for such an approach, i.e., the threshold number of upgrades or downgrades and the length of the time period in which to measure them, would need to balance two considerations. The first, which argues for a cutoff point defined by a smaller number of ratings changes in a longer time period, is the ratings agencies’ stated objective of measuring creditworthiness on a trend basis, insulated from the vagaries of business cycles. The second, which argues for a cutoff point defined by a larger number of ratings changes in a shorter time period, is the reality that ratings can, must, and do change in response to changing situations, in both the near and the medium term.

For the purpose of this paper, a failed rating is defined as one that is lowered or raised by three or more notches within 12 months, excluding downgrades or upgrades into, out of, within, or between the ratings categories from ‘CCC’ or ‘Caa’ downward. The choice of a three-notch adjustment within one year seeks to balance the various criteria and generate an analytically useful number of “true” signals (Box 5 and Figures 3 and 4). The exclusion for ratings adjustments at the lowest rungs of S&P’s, Moody’s, and Fitch’s scales reflects the fact that ratings are necessarily more volatile at such levels as they track near-

³⁸ See Kräussl (2000); Reisen and von Maltzan (1999); and Sy (2001).

³⁹ See Juttner and McCarthy (1998).

term developments with large potential ramifications for default risk.⁴⁰ Any series of downgrades or upgrades that generates a “true” signal indicates the failure of the affected rating as it stood at the onset of the adjustment cycle. Such series of downgrades or upgrades are viewed as corrections to failed ratings, and not as failure in themselves. Because ratings stand affirmed each day that they are not changed, the date on which the downgrade or upgrade cycle began is also the date to which the failure is ascribed.

The above definition does not discriminate between ratings that fail and those that move in line with rapid changes in underlying creditworthiness. Under the definition, S&P’s long-term foreign currency rating on Korea failed once in 1997, evidenced by ten notches of downgrades in less than two months, and failed again in 1998, evidenced by four notches of upgrades in just over 11 months. In other words, the definition suggests that S&P’s rating on Korea was too high going into the Asian crisis, and that the subsequent downgrades overshot. S&P, on the other hand, argues that its ratings actions for Korea in 1997–98 were necessitated by sharp movements in underlying creditworthiness, evidenced by the almost total evaporation of international reserves by end-1997 and subsequent rapid reserves replenishment.⁴¹ It is here that questions of degree, and threshold parameters in any definition of ratings failure, become important. Under the definition adopted for this paper, S&P’s counterargument on Korea holds up to a point: downgrades or upgrades by one or two notches within 12 months are accepted as “normal”; downgrades or upgrades by ten and four notches, respectively, indicate failure.

Applying this paper’s definition of failure to the long-term foreign currency sovereign ratings of S&P and Moody’s in 1997–2002 suggests, *prima facie*, that ratings failure was less prevalent in 1999–2002 than in 1997–98, particularly when viewed against the growing number of sovereigns rated during the same period. S&P recorded seven failures in 1997–98, one in 2000, and one in 2002. Moody’s recorded seven failures in 1997–98 and one in 2002. As a proportion of sovereigns rated, S&P’s average failure rate declined from 5.3 percent in 1997–98 to 0.6 percent in 1999–2002, while that for Moody’s declined from 4.4 percent to 0.2 percent.

The severity of each ratings failure can be measured by the number of notches by which the failed rating is upgraded or downgraded within the 12-month period. Again, the act of adjusting the rating is not failure, but correction of previous failure. From a purist perspective, once a rating has been determined to be erroneous, rapid correctives are preferable to a phased approach. From a pragmatic perspective, rapid downgrades or upgrades run the risk of overshooting, and can deliver destabilizing impulses to fragile markets. In some instances, S&P, Moody’s, and Fitch may correct erroneous ratings gradually in order to mask the fact that ratings failure has occurred. In any case, the severity

⁴⁰ See Beers and Chambers (1999).

⁴¹ See S&P (1997–2002 various).

of ratings failure is measured by the notches by which a rating is adjusted, and not by the speed of that adjustment. S&P's average failure severity was 4.9 notches in 1997–98 and 4.5 notches in 1999–2002, compared with Moody's 4.3 notches and 6.0 notches, respectively.

Ratings failure results are sensitive to definitional changes and methods of aggregation.

If, for instance, this paper had adopted a failure definition with three or more notches of ratings adjustment within six months rather than within 12 months, S&P's long-term foreign currency rating on Argentina would not be recorded among the failures. Conversely, the aggregation of ratings failures as presented here is an unweighted summation of individual failures. Summations weighted by the nominal U.S. dollar GDP of affected countries or by volumes of debt outstanding may also prove useful, but are not attempted here. With failures in 1997–2002 mostly affecting large emerging-market sovereigns, weighted summations would yield less favorable statistics. In particular, S&P's failure on Argentina would reverse the declining trend in its failure rate.

Box 5. Sovereign Ratings Failure Statistics, 1997–2002 1/

<u>Failure</u>	<u>Failed rating (& date) 2/</u>	<u>Corrected rating (& date) 2/</u>	<u>Notches adjusted 3/</u>	<u>Key factor</u>
S&P				
1997: Thailand	A (Sept. 3, 1997)	BBB- (Jan. 8, 1998)	4↓ (0.97)	Evaporation of reserves
1997: Indonesia	BBB (Oct. 10, 1997)	B- (Mar. 11, 1998)	7↓ (1.40)	Collapse of asset quality
1997: Korea	AA- (Oct. 24, 1997)	B+ (Dec. 22, 1997)	10↓ (5.26)	Evaporation of reserves
1997: Malaysia	A+ (Dec. 23, 1997)	BBB- (Sept. 15, 1998)	5↓ (0.57)	Collapse of asset quality
1998: Korea	B+ (Feb. 18, 1998)	BBB- (Jan. 25, 1999)	4↑ (0.36)	Reserves replenishment
1998: Romania	BB- (May 20, 1998)	B- (Oct. 19, 1998)	3↓ (0.61)	Evaporation of reserves
1998: Russia	BB- (June 9, 1998)	B- (Aug. 13, 1998)	3↓ (1.43)	Evaporation of reserves
2000: Argentina	BB (Nov. 14, 2000)	B- (July 12, 2001)	4↓ (0.50)	Fiscal slippage
2002: Uruguay	BBB- (Feb. 14, 2002)	B (July 26, 2002)	5↓ (0.94)	Evaporation of reserves
Moody's				
1997: Thailand	A2 (Apr. 8, 1997)	Ba1 (Dec. 21, 1997)	5↓ (0.68)	Evaporation of reserves
1997: Korea	A1 (Nov. 27, 1997)	Ba1 (Dec. 21, 1997)	6↓ (7.83)	Evaporation of reserves
1997: Indonesia	Baa3 (Dec. 21, 1997)	B3 (Mar. 20, 1998)	6↓ (2.05)	Collapse of asset quality
1997: Malaysia	A1 (Dec. 21, 1997)	Baa2 (Sept. 14, 1998)	4↓ (0.46)	Collapse of asset quality
1998: Russia	Ba2 (Mar. 11, 1998)	B3 (Aug. 21, 1998)	4↓ (0.75)	Evaporation of reserves
1998: Moldova	Ba2 (July 14, 1998)	B2 (July 14, 1998)	3↓ (90.00)	Evaporation of reserves
1998: Romania	Ba3 (Sept. 14, 1998)	B3 (Nov. 6, 1998)	3↓ (1.76)	Evaporation of reserves
2002: Uruguay	Baa3 (May 3, 2002)	B3 (July 31, 2002)	6↓ (2.07)	Evaporation of reserves

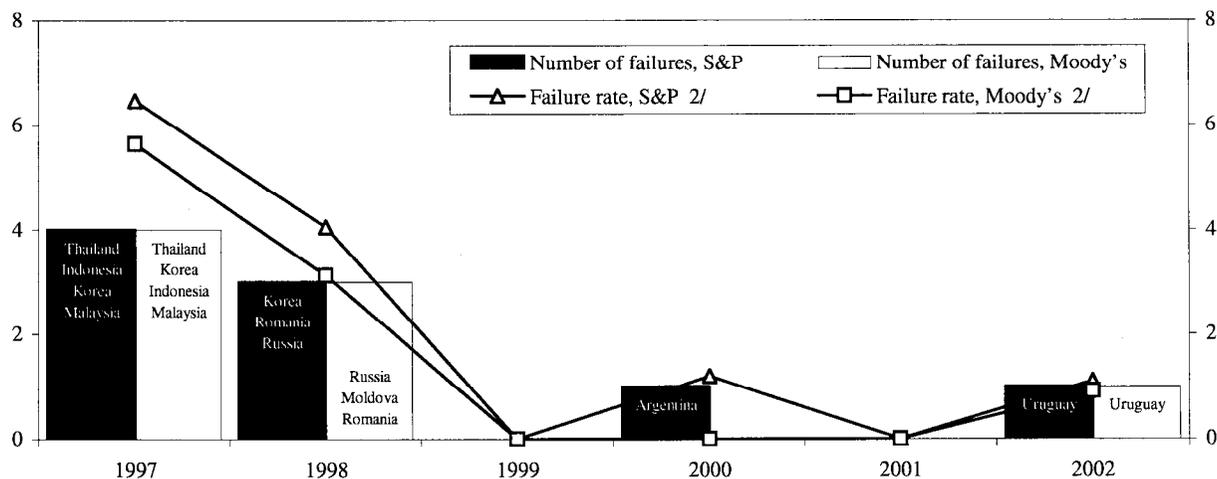
Sources: Levey (2002); Moody's (1997–2002 various); S&P (1997–2002 various); and S&P (2002).

1/ Ratings failure defined by successive downgrades or upgrades of a long-term foreign currency sovereign rating by three or more notches in aggregate during any rolling 12-month period, excluding downgrades or upgrades into, out of, within, or between the ratings categories from 'CCC' or 'Caa' downward. Based on ratings activity up to end-July 2002; coverage of failures from August 2001 on is therefore partial.

2/ Refers to the long-term foreign currency sovereign rating.

3/ Notches of ratings downgrades (↓) or upgrades (↑). Figures in parentheses capture the speed of adjustment, in notches per month (notches of adjustment divided by the number of months from start to end of the corrective sequence).

Figure 3. Incidence of Sovereign Ratings Failure, 1997–2002 1/

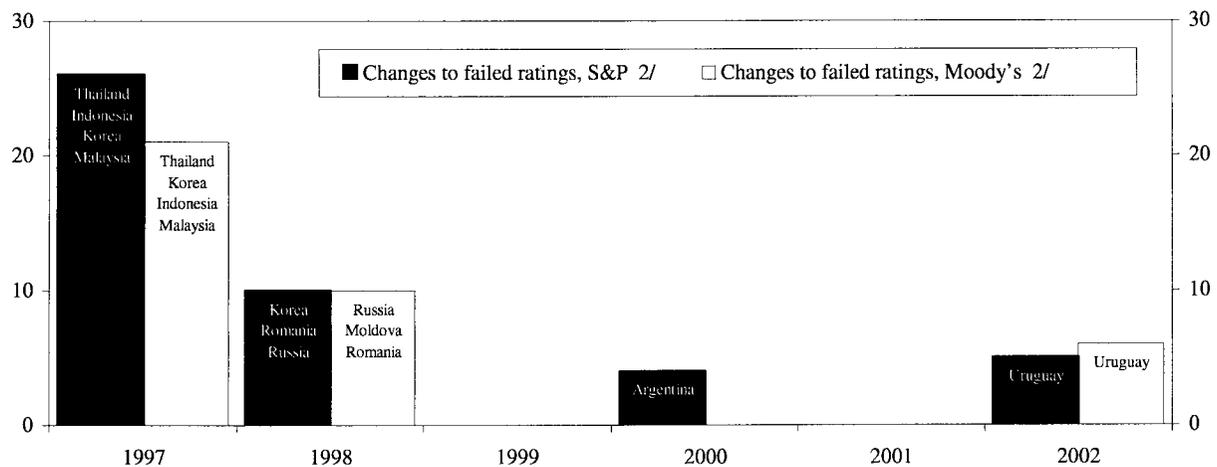


Sources: Levey (2002); and S&P (2002).

1/ Ratings failure defined as in Box 5. Based on ratings activity up to end-July 2002; coverage of failures from August 2001 on is therefore partial.

2/ Number of failures during year as a percentage of number of rated sovereigns at beginning of year. The number of sovereigns rated by S&P as of the beginning of each year was: 62 in 1997, 74 in 1998, 78 in 1999, 83 in 2000, 87 in 2001, and 90 in 2002. The number of sovereigns rated by Moody's as of the beginning of each year was: 71 in 1997, 96 in 1998, 104 in 1999, 108 in both 2000 and 2001, and 109 in 2002.

Figure 4. Severity of Sovereign Ratings Failure, 1997–2002 1/



Sources: Levey (2002); and S&P (2002).

1/ Ratings failure defined as in Box 5. Based on ratings activity up to end-July 2002; coverage of failures from August 2001 on is therefore partial.

2/ Aggregate number of notches by which failed ratings are downgraded or upgraded, excluding downgrades or upgrades into, out of, within, or between the ratings categories from 'CCC' or 'Caa' downward.

The argument that ratings performance has improved in recent years is more difficult to defend when viewed against the number of crisis episodes in 1997–2002. If currency depreciations beyond a certain threshold, bank runs above a certain intensity, or other measures of economic crisis are taken as proxies for losses in sovereign credit standing, then it may be argued that the decline in the frequency of ratings failure during 1997–2002 is explained largely by the decline in the frequency of emerging markets crisis during the same period. Citing ratings failures for Argentina and Uruguay in 2000–02, it could be argued that the agencies continued to miss almost every serious crisis episode and that in 2000–02, as in 1997–98, they continued to follow rather than lead the market consensus. Nevertheless, the ratings stability approach does throw up some preliminary findings.

Whether or not ratings performance has improved, failure observations for 1997–2002 indicate persistent upside bias in the ratings of both S&P and Moody’s. Under this paper’s definition of ratings failure, S&P and Moody’s together recorded 17 failures during 1997–2002: nine by S&P, and eight by Moody’s. Of the 17 failures, only one involved an underestimation of creditworthiness that had to be corrected by three or more notches of upgrades (Korea, after an overshooting of downgrades by S&P in 1997–98). As a proportion of ratings failures, the “underestimation rate” was only 11.1 percent for S&P, nil for Moody’s, and 5.9 percent overall. Although the low underestimation rates suggest that excessive ratings generosity was much more of a problem than undue caution, it could be argued that deliberately gradual ratings adjustments aimed at masking ratings failure are more prevalent in instances where creditworthiness is underestimated, given the more muted market reaction in the majority of such cases.

Failure observations for 1997–2002 also indicate a strong tendency towards herd behavior. Although not tested in detail here, it is generally agreed that the sovereign credit ratings of S&P, Moody’s, and Fitch display a high degree of correlation.⁴² This is not a problem *per se*. Because each sovereign debt instrument can have only one discreet probability of default at any given point in time, the ratings assigned to it by all agencies should be identical. Herd behavior becomes a problem only if ratings failure by one agency induces ratings failure by another agency. Of the 17 failures recorded by S&P and Moody’s in 1997–2002, 14 were failures common to both agencies; two were by S&P only (Korea in 1998 and Argentina); and one was by Moody’s only, on a sovereign that is not rated by S&P (Moldova). Excluding the failure on the one sovereign not rated by both agencies, 87.5 percent of the ratings failures during 1997–2002 were by both S&P and Moody’s on the same sovereign in the same year.

⁴² Interagency correlations of long-term foreign currency sovereign ratings (transposed into scores) stood at S&P:Moody’s 0.9781, S&P:Fitch 0.9855, and Moody’s:Fitch 0.9862 as of end-July 2002.

C. Causes of Ratings Failure

Despite some decline in failure rates, sovereign ratings failure remains a recurring problem, as illustrated in 2002 by the multiple downgrades on Uruguay, which was rated in the investment grade by S&P and Moody's until February and May, respectively, before descending into the low speculative grade by end-July. The severity of the downgrades on Uruguay's long-term foreign currency ratings—five notches by S&P and six notches by Moody's—suggests that neither agency appreciated the magnitude of its vulnerabilities much in advance of market participants. Although available information does not allow outside observers to track the dynamics behind individual failures, it is possible nevertheless to separate possible causes of ratings failure into various stylized categories. Four actual or potential issues can be identified: information risk, analytical constraints, revenue bias, and other incentive problems. Each is discussed in brief below.

1. *Information risk*

The first and most basic problem confronting the ratings agencies is information risk. Most macroeconomic data are collected directly from rated sovereigns and cross-checked to the extent possible against data from multilateral sources such as the IMF and the BIS. Ultimately, however, the quality and timeliness of data received are a function of each rated government's statistical and administrative capacities, the reporting requirements it imposes on business entities within its jurisdiction, and its level of cooperation with the ratings agencies.

Most rated sovereigns have signed ratings agreements that commit them to provide all relevant information to the agencies on request, on an ongoing basis. S&P will not commence analysis on an unrated sovereign until such time as it has signed a ratings agreement. Moody's may rate a sovereign without its acquiescence in order to facilitate fee-based subsovereign ratings activity within those jurisdictions. Fitch's position with regard to "unsolicited" ratings has not been ascertained. Whether or not agreements have been signed, however, the reality is that the extent of governments' cooperation with the agencies is a function of their debt-issuance strategies and a multitude of other factors, with ratings often assigned or maintained in the absence of full information.⁴³

Sovereign ratings analysts have limited ability to corroborate official data. Problems relating to insufficient transparency tend to be particularly pronounced in the fiscal and external sectors. Few governments provide timely data on provincial-level finances. Many governments lack clear guidelines on the provision of sovereign guarantees to public and private sector entities, and presumptions of sovereign support arising out of political connections are even more difficult to identify. Similarly, despite the agencies' now-routine

⁴³ Romania, for instance, attaches high priority to cooperation with the ratings agencies, because Eurobond issuance forms an important part of its funding strategy.

scrutiny of investment guidelines for official reserves, it may be impossible to independently verify the extent to which a central bank has rendered its reserves illiquid by entering into forward contracts or other derivatives transactions, or to detect incomplete coverage in short-term external debt statistics.

The concept of information risk helps explain the observed upside bias in the sovereign credit ratings of both S&P and Moody's, with data shortcomings or willful concealment generally masking credit weaknesses rather than credit strengths. Despite efforts by the agencies to cross-check key statistics, it is widely accepted that information inadequacies were a major factor behind the spate of ratings failures in Asia during 1997–98, with unfavorable revisions to various data prompting re-assessments by investors and ratings agencies alike.⁴⁴ Often, the agencies will respond to informational problems by making conservative assumptions. Explicit acknowledgement of information risk is rare, because announcements to such effect are viewed as detrimental to credibility: ratings assess creditworthiness, not transparency, and information collection is an integral part of the ratings task.

2. Analytical constraints

The second problem confronting the ratings agencies is an analytical resource constraint.⁴⁵ At least one of the agencies, S&P, treats its sovereign ratings practice as a stand-alone profit center, expected, at the least, to break even.⁴⁶ Revenues accrue primarily from ratings fees, ranging from about \$50,000 per year for small issuers to \$150,000 per year (or more) for large issuers. Costs include salaries and travel outlays, with teams of two or three analysts expected to visit each rated sovereign at least once every two years, and often much more frequently. None of the major ratings agencies discloses revenue and cost data for its sovereign ratings practice.

As profit-seeking entities, all three major ratings agencies strive to maintain streamlined operations, resulting in considerable rationing of analytical man-hours. S&P's sovereign ratings group consisted of ten analysts based in New York and London at the beginning of 1997 and doubled to 20 analysts based in New York, London, and Singapore as of end-July 2002. At the same time, the number of sovereigns rated by S&P increased from 62 to 93, with the sovereigns-per-analyst workload falling from 6.1 to 4.6. Fitch's sovereigns-per-analyst ratio stood at 4.3 as of end-March 2002. The size of Moody's sovereign ratings practice is not readily available.

⁴⁴ See Berg (1999); and Kochhar, Loungani, and Stone (1998).

⁴⁵ See Adams, Mathieson, and Schinasi (1999); and Karacadag and Samuels (1998).

⁴⁶ It is not clear whether Moody's and Fitch treat their sovereign ratings practices as stand-alone profit centers.

The heavy workload at the ratings agencies may result in an element of piggybacking, with analysts relying to varying degrees on research produced by the IMF, academia, investment banks, and—conceivably—other ratings agencies as they seek to remain abreast of developments. To the extent that analysis free-rides on the IMF or other entities, the agencies dilute their own contribution, running the risk of simply joining the prevailing consensus. To the extent that analysis free-rides on market participants or their affiliates, the agencies compromise their objectivity. The relatively small action by an individual analyst of tabling selected investment bank “sell-side” or “buy-side” research literature in a ratings committee can trigger a string of errors culminating in ratings failure. Despite ongoing efforts by the agencies to increase their analytical resource bases and introduce greater specificity into their ratings methodologies, it may be argued that ratings failures such as that for Uruguay in 2002 were the result of inattention, with insufficient resources devoted to data gathering, corroboration, and analysis.

The concept of piggybacking does not necessarily explain the upside bias in sovereign credit ratings, but may help explain herd behavior. Debtors have a natural interest in overstating their creditworthiness, and creditors in understating it. As long as analytical piggybacking by the ratings agencies places roughly equal weight on creditor and debtor opinions, therefore, it need not induce a bias. Piggybacking between agencies, on the other hand, would exacerbate herd behavior. Problems of analytical neglect may be most severe for the smallest issuers. Although not tested here, the number of rated subsovereign entities within each jurisdiction may prove to be a useful predictor of ratings failure at the low end of the debt issuance scale.

3. *Revenue bias*

The third problem confronting the ratings agencies is a skewed incentive structure resulting from excessive reliance on issuer fees. With all sovereign ratings and a significant portion of sovereign ratings research available *gratis* (and, in the case of S&P, with publishing proceeds accruing to a separate information services group), the sovereign ratings practices of S&P, Moody’s, and Fitch collect little or no revenue from the users of their ratings. With subsovereign ratings criteria relying to varying extents on sovereign analysis, users include other ratings practices within each agency, and they too do not pay for such usage. Each agency’s sovereign ratings group faces an asymmetry in its revenue structure, with reliance on fee income from issuers creating incentives in favor of ratings generosity. The bias is especially acute in the case of new ratings, because ratings agreements typically allow previously unrated issuers to suppress their ratings, if they so prefer, and because interagency competition tends to be focused on attracting new ratings clients.⁴⁷

⁴⁷ New ratings remain confidential until the client sanctions their release or issues debt under Rule 144A of the U.S. Securities and Exchange Code, whichever comes first. (Rule 144A provides a safe harbor against the registration requirements of the Code for sales of “restricted securities” to qualified institutional investors.)

The problem is amplified by the fact that sovereign ratings carry important revenue multipliers for subsovereign ratings activity. It is a basic tenet of ratings doctrine that, regardless of whether a subsovereign entity is to be rated below, at, or above the sovereign ceiling, no issuer within a given jurisdiction can be rated until the relevant sovereign ratings have been determined. Considerable weight is attached to transfer and convertibility risk, and to the likelihood of sovereign interference more generally, in determining the foreign currency ratings of subsovereign issuers. More often than not, each sovereign ratings downgrade will trigger follow-on downgrades on most rated subsovereign issuers within the affected jurisdiction, with knock-on effects for other ratings groups' fee-based incomes. Consequently, the larger the volume of subsovereign ratings activity within a given country, the greater is the revenue multiplier in the sovereign ratings, and the greater is the pressure from each agency's corporate, financial institutions, and other ratings groups for leniency in sovereign ratings decisions.

The concept of business interference in ratings decisions helps explain both upside bias and herd behavior. With low fee rates leaving little room for price competition between the sovereign ratings practices of S&P, Moody's, and Fitch, and with sovereign ratings actions impacting directly on subsovereign ratings revenue, incentives for generosity in sovereign ratings are strong. Problems of business interference may be most severe for the largest issuers. Although not tested here, the number of rated subsovereign entities within each jurisdiction may well prove to be a powerful predictor of upside bias and ratings failure at the high end of the debt issuance scale.

4. Other incentive problems

Other problems confronting the ratings agencies include the challenge of maintaining arm's-length relationships with issuers, investors, and each other. The investigative aspect of ratings work is supported by codes of conduct that forbid analysts from dispensing advice to issuers. Annual disclosures of personal investments (along with those of spouse and dependent minors) are mandatory for analytical staff, and no analyst may vote on ratings committees that affect issuers of debt that he holds. Although job contracts do not forbid future employment by issuers, few, if any, sovereign analysts have sought work with the governments that they have rated, with most preferring to move on to investment banks instead. As a result, the sovereign ratings practices of S&P, Moody's, and Fitch have generally not suffered the "revolving-door" problem of analyst integrity compromised by aspirations of future employment by clients. S&P and Moody's do not hire staff from Fitch or from each other, by tacit agreement. Fitch has been known to hire analysts from S&P and Moody's.

The diversification by all three major agencies into parallel ratings-advisory business has brought new conflicts of interest. During 1997–2002, motivated by the pull of additional revenue, S&P introduced a ratings evaluation service, and both Moody's and Fitch

introduced risk management services.⁴⁸ Behind the inception of such business lines is the assumption that it is possible to provide ratings with one hand and consultancy with the other. Although each agency asserts that it has installed internal firewalls and other checks and balances, it is not clear whether the new activities are wholly consistent with the requirements of independence. A more detailed evaluation is not attempted here.

D. Methodological and Other Developments After the Asian Crisis

For the agencies, the short-run financial benefits of ratings leniency are counterbalanced by the long-run reputational costs of ratings failure. Sovereign ratings stand at the apex of the ratings pyramid and are, in a sense, the agencies' premier product. Given their country-ceiling function and topical value, sovereign ratings tend to attract far more media and market attention than other ratings. In an industry where reputation is paramount, good publicity is of great value. Conversely, bad publicity can wreak great damage. It is such franchise considerations, ultimately, that drive S&P, Moody's, and Fitch to seek to maintain high standards and minimize occurrences of ratings failure.

Governments pay for credit ratings for a number of reasons. In the majority of cases, the primary motivation is to seek an internationally respected "seal of approval" in order to broaden the investor base and drive down the cost of sovereign borrowing. In some cases, the motivation is to establish a sovereign risk benchmark in order to facilitate subsovereign ratings and debt-issuance activity.⁴⁹ In still other cases, the motivation may simply be to be "on the map" for foreign direct investors, with sovereign ratings providing a benchmark for discount rates used in calculations of internal rates of return.⁵⁰ In all cases, the presumption is that the credit ratings of S&P, Moody's, and Fitch enjoy strong credibility with a broad range of market participants. To ensure a breadth of opinion, governments will typically seek to be rated by two or even three agencies.

When faced with rapidly changing information sets, the agencies must balance analytical and perceptual considerations. In theory, ratings should factor in all vulnerabilities well in advance of crises, such that a crystallization of risks need not trigger downgrades. In practice, however, such an approach would leave the agencies open to charges of unresponsiveness, because some downward adjustment of ratings may be viewed by the media and the markets as "proactive". Good publicity is often sought and won, therefore, by selective and well-timed ratings downgrades, as opposed to ratings affirmations.

⁴⁸ See "New interests, new conflicts", *The Economist*, April 14, 2001.

⁴⁹ This applies in the case of India, first rated by Moody's in 1988 and by S&P in 1990, where international bonds are issued periodically by state-owned entities such as ICICI and the State Bank of India, but not by the sovereign.

⁵⁰ This may have been the case for Chile, first rated by S&P in 1992 and by Moody's in 1994, where no sovereign international bond was issued until 1999.

The spate of sovereign ratings failures in Asia in 1997–98 generated widespread criticism of S&P, Moody’s, and Fitch. The two principal accusations hurled at the agencies were that they failed to detect serious vulnerabilities in advance of the crisis; and that they over-reacted with procyclical downgrades when the crisis broke, fueling disorderly workouts by creditors and depositors and generally worsening an already bad situation. Far from providing ballast for the markets, the agencies were widely viewed as a force for instability during the Asian crisis. Externally, S&P, Moody’s, and Fitch defended their track records with varying degrees of vigor.⁵¹ Internally, the balance of incentives had been tilted in favor of franchise considerations, and senior management in all three agencies set in motion a range of corrective initiatives.

Countermeasures instituted after the Asian crisis focused on analytical issues. In the case of S&P, the emphasis was threefold: a doubling of the staff strength of the sovereign ratings group; greater specificity in methodology to better ensure the comprehensiveness of committee deliberations; and stricter conformity with scoring guidelines to better protect the comparability of ramp scores. Between April 1997 and April 2002, the number of categories in S&P’s sovereign ratings ramp expanded from eight to ten (Box 6). A third fiscal score was added, aimed specifically at the quantification of off-budget and contingent liabilities; a score for balance of payments flexibility, a generic concept linked mainly to current account balances, was replaced by a score aimed specifically at the quantification of reserves adequacy; and a combined score for external debt was split into two separate scores for public and private sector external debt.

Analysis prior to the Asian crisis had focused on traditional macroeconomic indicators, the so-called “fundamentals”, with limited emphasis on contingent liability and international liquidity considerations. The government’s fiscal stance was measured by its budget balance, and the economy’s external position by its current account balance. Rapid growth was viewed favorably, often regardless of the pace of domestic credit expansion. Contingent liabilities were measured as explicit sovereign guarantees outstanding, reserves adequacy by import cover, and external debt sustainability by the debt-service ratio including rollover requirements on short-term debt but ignoring put options. Financing of current account deficits was discussed in committee, but no dedicated score was assigned for capital account developments. Little emphasis was placed on corporate sector issues, except when individual analysts deemed so fit. By most traditional measures, Indonesia, Korea, Malaysia, and Thailand faced modest, as opposed to catastrophic, risks in early 1997, and all four sovereigns were rated in the investment grade.

The rapidly unfolding events of the Asian crisis were a learning experience for the ratings agencies, as they were for market participants. Faced with multiple simultaneous challenges, ratings methodologies were modified on an *ad hoc* basis, and institutionalized later. The crisis threw up many new lessons. One was the extent to which equity and real

⁵¹ See Fitch IBCA (1998); and Moody’s (1998).

estate asset price adjustments could generate negative wealth effects, causing collapses in household consumption, investment, and output. Another was the extent to which reserves inadequacy could create refinancing risks, with disorderly external-creditor workouts forcing sharp adjustments in real exchange rates. Yet another was the extent to which corporate sector leverage could create vulnerabilities to interest rate and exchange rate shocks, which could trigger chain reactions of bankruptcy, collapsing financial system asset quality, and fiscally funded bank recapitalization.⁵²

Box 6. S&P Sovereign Ratings Ramps, 1997 vs. 2002

April 1997

1. Political stability
2. Economic prospects I: structure
3. Economic prospects II: growth
4. Fiscal flexibility I: budgetary flexibility
5. Fiscal flexibility II: public debt
6. Price stability
7. External flexibility I: BoP flexibility
8. External flexibility II: external debt

April 2002

1. Political stability
2. Economic prospects I: structure
3. Economic prospects II: growth
4. Fiscal flexibility I: revenue, expenditure and balance performance
5. Fiscal flexibility II: debt and interest burdens
6. Fiscal flexibility III: off-budget and contingent liabilities
7. Monetary stability
8. External flexibility I: liquidity
9. External flexibility II: public sector net external debt
10. External flexibility III: bank and private sector net external debt

Sources: Beers and Cavanaugh (1997); and Beers, Cavanaugh, and Ogawa (2002).

As lessons were absorbed, sovereign ratings methodologies evolved towards what may be characterized as a balance sheet approach. First, international liquidity considerations jumped to prominence, with old indicators such as import cover almost completely replaced by new ratios of reserves to residual-maturity short-term debt, reserves to financing gaps, and reserves to money supply. Second, heavy emphasis was placed on corporate leverage and its

⁵² See Kim and Stone (1999); and Stone (2000).

linkages to fiscal and external risks, with intermediated corporate financing tracked through the financial system, and disintermediated financing through domestic bond market data and external debt statistics. Recognizing the difficulty of collecting comprehensive and comparable data on corporate debt-equity ratios, the ratio of nongovernment credit to GDP was introduced as an imperfect proxy, supported by detailed scrutiny of financial system asset quality.

Other countermeasures instituted after the Asian crisis included concerted action to reduce information risk. Each agency sought to buttress its analysis with more thorough data authentication, including through strengthened internal cooperation between sovereign ratings analysts and their counterparts in the corporate, financial institutions, structured finance, and other ratings groups. At the same time, sea changes were taking place in the attitudes towards disclosure of many national authorities. Supported by international standards and codes such as the IMF's General Data Dissemination Standards and Special Data Dissemination Standards, the coverage, reliability, and timeliness of publicly available data increased manifold. In 1997, IMF Article IV consultation staff reports were confidential documents. By 2002, a multitude of such reports were available via the Internet.

For the ratings agencies, the reduction of information risk during 1997–2002 was accompanied by an erosion of information privilege. Traditionally, the agencies' sovereign ratings practices had relied on three principal comparative advantages: privileged access to information, enshrined in their ratings agreements with issuers; in-house expertise on subsovereign risk, reposed in their corporate, financial institutions, and other ratings groups; and a global comparative perspective, embodied in peer comparisons by ratings category rather than geography. Other private sector entities could duplicate the subsovereign analysis and global approach to sovereign risk, but generally lacked information privilege. As the revolution in economic transparency progressed and the agencies' information privilege dwindled, the onus on subsovereign expertise and global perspective increased steadily.

IV. CONCLUSION

This paper has attempted to provide an overview of the definitional frameworks, decision-making processes, and analytical methodologies behind sovereign credit ratings. Much of the methodology described herein represents “best practice”, often constrained by business-related factors. Even so, by entering into the “black box” of ratings methodology, the paper has tried to highlight the extent to which sovereign credit ratings are the product of a systematic and evolving process. In attempting to evaluate that process, the paper has tried to pinpoint problems and identify areas for further improvement. In some respects—notably, the manner in which corporate and financial system analysis has been endogenized into a sovereign-specific framework—the agencies' approach to vulnerability assessment may provide useful insights to the IMF in its surveillance work.

In essence, sovereign ratings are a product of a one-size-fits-all ranking process. The analysis is disaggregated into a number of categories, each of which is assessed in relation to the strengths and weaknesses of other rated sovereigns. Analytical categories cover political

stability, the real economy, and the fiscal, monetary, and external sectors. The interface between the corporate and financial sectors and the sovereign balance sheet is institutionalized via a careful process of contingent liabilities estimation. The interface between market developments and sovereign vulnerabilities is institutionalized via detailed scrutiny of international liquidity factors. In an effort to protect the process from business-related pressures and to preserve an element of discretion, all ratings decisions are taken by committee vote. The limited predictability of economic behavior in general and of political developments in particular leaves the task of credit ratings assessment poorly suited to formulaic straightjackets, and the decision-making methodologies of S&P, Moody's, and Fitch blend objective, numerical analysis with subjective, informed debate.

Improvements in ratings methodology and economic transparency since the Asian crisis augur well for the future. Methodological changes during 1997–2002 have focused on increasing the weights attached to international liquidity and contingent liability considerations. In the process, analysis of financial systems and corporate sectors has strengthened significantly, with ratings no longer a function of “headline” indicators only. Based on definitions adopted for this paper, failure rates as a proportion of rated sovereigns have fallen since 1997–98, with crises such as those affecting Pakistan in 1998 and Brazil in 2002 not generating failure signals. Failure observations in 1997–2002 point to consistent upside bias in the ratings, and do not support the view that ratings became overly cautious after the Asian crisis. Failure observations also point to strong herd behavior between S&P and Moody's, with the ratings of Fitch not tested because of data constraints.

The discussion on causes of ratings failure underscores the importance of microeconomic distortions in the ratings process. Four possible causes of ratings failure are identified in this paper: information risk, analytical constraints, revenue bias, and other incentive problems. Of these, two—revenue bias and other incentive problems—are largely unrelated to analytical methodology. Neither has been addressed in any substantive way to date: each agency's sovereign ratings group remains excessively reliant on issuer-fee revenue, creating incentives for ratings generosity; and ongoing diversification into parallel consultancy business may be exacerbating conflicts of interest, strengthening incentives for ratings generosity. Other than to note that internal cost accounting could usefully provide some user-fee revenue to each agency's sovereign ratings practice by obliging other ratings groups to pay for sovereign analysis, this paper does not propose to make recommendations on fee structures in the ratings industry.

The definition of ratings failure adopted in this paper will be further refined through follow-up empirical work, in an effort to shed additional light on the predictive power of sovereign credit ratings. First, the economic variables listed in S&P's ramp will be tested against S&P's ratings to determine relative weights. Second, a political stability variable will be added to improve goodness of fit. Third, once the coefficients have been determined, “credit ratings” will be retroactively assigned to sovereigns for periods before they were rated, and those ratings will be tested against a larger sample of sovereign default data. Separately, it may be possible to measure ratings failure by deviations from an underlying latent variable representing “true” creditworthiness, possibly by utilizing signals-based early

warning models, several of which have been developed by the IMF in recent years. Finally, the number of rated subsovereign entities within each sovereign jurisdiction will be tested against ratings failure, exploring the hypothesis that the smallest and largest issuers are more vulnerable to failure than those in the middle of the debt issuance scale.

The paper also throws up possibilities for follow-up policy-oriented research. One question that will be explored is the extent to which sovereign ratings can help accelerate the process of sovereign debt restructuring. Sovereign ratings provided important risk information during the restructuring exercises by Pakistan in 1999 and Ecuador in 2000, facilitating the pricing of those bond exchanges. Since their beginnings in the early nineteenth century, sovereign cross-border debt markets have, in default situations, sought to find an appropriate balance between dislocation of defaulters—a key disincentive to default—and the preservation of asset values. Detailed comparisons between recent international bond restructurings by rated sovereigns, syndicated loan restructurings in the 1970s and 1980s, and international bond restructurings in the pre-IET era may help shed light on whether market-based procedures for sovereign default-resolution are becoming, or can be expected to become, more efficient over time.

The importance of sovereign credit ratings is likely to continue to increase in the years to come. The period 1997–2002 saw sovereign ratings methodology adjusted to keep pace with emerging-market developments. With most significant issuers of sovereign debt already rated, future growth in sovereign ratings is likely to be concentrated on low-speculative-grade developing countries. In 2002, for instance, the U.S. government launched an initiative to fund new ratings on 20 sovereigns in Sub-Saharan Africa. The U.S. Secretary of State summed up his administration’s views on sovereign ratings as follows: “By attaining a sovereign credit rating, your country will help reduce risk and encourage investment. A sovereign credit rating gives courage to capital.”⁵³ It is entirely likely that the next phase of methodological development will be tailored to the challenges of rating low-income-country governments.

⁵³ See United States, Department of State (2002). After a competitive tender, the contract was awarded to Fitch.

Table A1. S&P Sovereign Ratings History, 1975–2002 1/
(Long-term foreign currency sovereign ratings at beginning of period unless otherwise noted)

Rating	1975	1980	1985	1990	1995	2000	End-July 2002
AAA or AA	Canada, United States	Australia, A, United States, Canada, Finland, France, New Zealand, Norway, Sweden, United Kingdom, United States, Venezuela	Australia, Austria, Canada, Denmark, Finland, France, Germany, Norway, Sweden, United Kingdom, United States	Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States	Australia, Austria, Belgium, Bermuda, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Liechtenstein, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States	Australia, Austria, Belgium, Bermuda, Canada, Denmark, Finland, France, Germany, Ireland, Isle of Man, Italy, Japan, Liechtenstein, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States	Australia, Austria, Belgium, Bermuda, Canada, Denmark, Finland, France, Germany, Ireland, Isle of Man, Italy, Japan, Liechtenstein, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States
A or BBB				China, Greece, Hong Kong, SAR, Hungary, Iceland, Israel, Korea, Malaysia, Portugal, Thailand, Turkey	Chile, China, Colombia, Czech Republic, Greece, Hong Kong SAR, Iceland, Indonesia, Israel, Korea, Malaysia, Malta, Thailand	Barbados, Chile, China, Croatia, Cyprus, Czech Republic, Egypt, Estonia, Greece, Hong Kong SAR, Hungary, Iceland, Israel, Korea, Kuwait, Latvia, Lithuania, Malaysia, Malta, Mexico, Oman, Poland, Qatar, Slovak Republic, Thailand, Trinidad and Tobago, Tunisia, Uruguay	Bahrain, Barbados, Botswana, Chile, China, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hong Kong SAR, Hungary, Iceland, Israel, Korea, Kuwait, Latvia, Lithuania, Malaysia, Malta, Mexico, Oman, Poland, Qatar, Slovak Republic, Slovenia, South Africa, Thailand, Trinidad and Tobago, Tunisia
BB or B			Venezuela	Brazil, Venezuela	Argentina, Brazil, Hungary, India, Mexico, Pakistan, Philippines, Slovak Republic, South Africa, Trinidad and Tobago, Turkey, Uruguay, Venezuela	Argentina, Bolivia, Brazil, Bulgaria, Colombia, Cook Islands, Costa Rica, Dominican Republic, Egypt, El Salvador, Grenada, Guatemala, India, Jamaica, Jordan, Kazakhstan, Lebanon, Mongolia, Morocco, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Senegal, Suriname, Turkey, Venezuela	Belize, Bolivia, Brazil, Bulgaria, Colombia, Cook Islands, Costa Rica, Dominican Republic, Egypt, El Salvador, Grenada, Guatemala, India, Jamaica, Jordan, Kazakhstan, Lebanon, Mongolia, Morocco, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Senegal, Suriname, Turkey, Venezuela, Uruguay, Venezuela, Vietnam
CCC, CC, C or SD						Indonesia, Russia	Argentina, Ecuador, Indonesia

Source: S&P (2002).

1/ Includes ratings on entities that S&P may consider to be sovereign governments though not generally classed as such.

Table A2. Moody's Sovereign Ratings History, 1975-2002 1/
(Long-term foreign currency sovereign ratings at beginning of period unless otherwise noted)

Rating	1975	1980	1985	1990	1995	2000	End-July 2002 2/
Aaa or Aa	Australia, Canada, United States	Australia, Canada, France, Norway, Sweden, United Kingdom, United States	Australia, Canada, Finland, France, Japan, Norway, Sweden, Switzerland, United Kingdom, United States	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, Taiwan, Kingdom, United States	Australia, Austria, Belgium, Bermuda, Canada, Cayman Islands, Denmark, Finland, France, Germany, Gibraltar, Guernsey, Iceland, Ireland, Isle of Man, Italy, Japan, Jersey, Liechtenstein, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Portugal, San Marino, Sark, Singapore, Spain, Sweden, Switzerland, Taiwan, Province of China, United Kingdom, United States	Alderney, Andorra, Australia, Austria, Belgium, Bermuda, Canada, Cayman Islands, Denmark, Finland, France, Germany, Gibraltar, Guernsey, Iceland, Ireland, Isle of Man, Italy, Japan, Jersey, Liechtenstein, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Portugal, San Marino, Sark, Singapore, Spain, Sweden, Switzerland, Taiwan, Province of China, United Kingdom, United States	Alderney, Andorra, Australia, Austria, Belgium, Bermuda, Canada, Cayman Islands, Denmark, Finland, France, Germany, Gibraltar, Guernsey, Iceland, Ireland, Isle of Man, Italy, Japan, Jersey, Liechtenstein, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Portugal, San Marino, Sark, Singapore, Spain, Sweden, Switzerland, Taiwan, Province of China, United Kingdom, United States
A or Baa				China, Hong Kong SAR, Hungary, Iceland, India, Korea, Malaysia, Portugal, Thailand	Chile, China, Czech Republic, Greece, Hong Kong SAR, Iceland, India, Indonesia, Italy, Korea, Malaysia, Malta, Portugal, South Africa, Thailand	Bahamas, Chile, China, Croatia, Cyprus, Czech Republic, El Salvador, Estonia, Greece, Hong Kong SAR, Hungary, Israel, Korea, Kuwait, Latvia, Macao SAR, Malaysia, Malta, Mauritius, Mexico, Oman, Panama, Poland, Qatar, Saudi Arabia, Slovenia, South Africa, Tunisia, United Arab Emirates, Uruguay	Bahamas, Barbados, Botswana, Chile, China, Croatia, Cyprus, Czech Republic, El Salvador, Estonia, Greece, Hong Kong SAR, Hungary, Israel, Korea, Kuwait, Latvia, Macao SAR, Malaysia, Malta, Mauritius, Mexico, Oman, Poland, Qatar, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Thailand, Trinidad and Tobago, Tunisia, United Arab Emirates
Ba or B				Argentina, Brazil, Venezuela	Argentina, Barbados, Brazil, Colombia, Hungary, Mexico, Pakistan, Philippines, Trinidad and Tobago, Turkey, Uruguay, Venezuela	Argentina, Bahrain, Barbados, Belize, Bolivia, Brazil, Bulgaria, Colombia, Costa Rica, Dominican Republic, Egypt, Fiji, Guatemala, Honduras, India, Indonesia, Jamaica, Jordan, Kazakhstan, Lebanon, Lithuania, Mexico, Moldova, Morocco, Nicaragua, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Slovak Republic, Thailand, Trinidad and Tobago, Turkey, Turkmenistan, Ukraine, Venezuela, Vietnam	Bahrain, Barbados, Belize, Bolivia, Brazil, Bulgaria, Colombia, Costa Rica, Dominican Republic, Egypt, Fiji, Guatemala, Honduras, India, Indonesia, Jamaica, Jordan, Kazakhstan, Lebanon, Lithuania, Morocco, Nicaragua, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Turkey, Turkmenistan, Ukraine, Uruguay, Venezuela, Vietnam
Caa, Ca or C					Cuba, Ecuador, Pakistan	Cuba, Ecuador, Pakistan	Argentina, Cuba, Ecuador, Moldova

Sources: Levey (2002); and Moody's ratings data from Bloomberg L.P.

1/ Includes ratings on entities that Moody's may consider to be sovereign governments though not generally classed as such.

2/ Moody's withdrew its ratings on the Islamic Republic of Iran on June 3, 2002.

REFERENCES

- Adams, Charles, Donald J. Mathieson, and Garry Schinasi, 1999, *International Capital Markets, Annex V, Credit Ratings and the Recent Crises*, World Economic and Financial Surveys (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/ft/icm/1999/index.htm>.
- Ammer, John, and Frank Packer, 2000, "How Consistent are Credit Ratings? A Geographical and Sectoral Analysis of Default Risk," International Finance Discussion Paper No. 668 (Washington: Board of Governors of the Federal Reserve System). Available via the Internet at: <http://www.federalreserve.gov/pubs/ifdp/2000/default.htm>.
- Beers, David T., and Ashok V. Bhatia, 1999, "Sovereign Defaults: Hiatus in 2000?" *Standard & Poor's RatingsDirect* (December 15). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- and John Chambers, 1999, "Debt Indentures to Play Greater Role in Sovereign Ratings Analysis," *Standard & Poor's CreditWeek* (April 14).
- Beers, David T., and Marie Cavanaugh, 1997, "Sovereign Credit Ratings: A Primer," *Standard & Poor's Sovereign Reports* (April).
- and Takahira Ogawa, 2002, "Sovereign Credit Ratings: A Primer," *Standard & Poor's RatingsDirect* (April 3). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Beers, David T., Marie Cavanaugh, and François Veverka, 1998, "Local and Foreign Currency Ratings Converge for EMU Issuers," *Standard & Poor's RatingsDirect* (May 6). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Beers, David T., and John Chambers, 1999, "Sovereign Ratings Display Stability Over Two Decades," *Standard & Poor's RatingsDirect* (April 5). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Beers, David T., and Laura Feinland-Katz, 2001, "Sovereign Risk and Ratings Above the Sovereign," *Standard & Poor's RatingsDirect* (July 23). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Berg, Andrew, 1999, "The Asia Crisis: Causes, Policy Responses, and Outcomes," IMF Working Paper 99/138 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=3295.0>.

- , Eduardo Borensztein, Gian Maria Milesi-Ferretti, and Catherine Pattillo, 2000, *Anticipating Balance of Payments Crises: The Role of Early Warning Systems*, IMF Occasional Paper No. 186 (Washington: International Monetary Fund).
- Bos, Rojer J., and Brooks Brady, 2002, "Record Defaults in 2001 the Result of Poor Credit Quality and a Weak Economy," *Standard & Poor's RatingsDirect* (February 6). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Bugie, Scott, John Chambers, Michael T. DeStefano, and Ernest D. Napier, 2001, "Global Financial System Stress," *Standard & Poor's RatingsDirect* (October 9). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Cantor, Richard, and Jerome S. Fons, 1999, "The Evolving Meaning of Moody's Bond Ratings," *Moody's Investors Service Rating Methodology* (August). Available via the Internet at: <http://www.moody.com>.
- Cantor, Richard, and Frank Packer, 1996, "Determinants and Impacts of Sovereign Credit Ratings," Research Paper No. 9608 (New York: Federal Reserve Bank of New York). Available via the Internet at: http://www.ny.frb.org/rmaghome/econ_pol/1096cant.html.
- Fitch IBCA, 1998, "After Asia: Some Lessons of the Crisis," *Fitch IBCA Sovereign Comment* (January 13). Available to subscribers via the Internet at: <http://www.fitchratings.com>.
- Fitch Ratings, 2001, *Fitch Sovereign Ratings: Rating Methodology* (New York). Available via the Internet at: <http://www.fitchratings.com/corporate/sectors/criteria>.
- Hamilton, David T., 2002, "Default and Recovery Rates of Corporate Bond Issuers: A Statistical Review of Moody's Ratings Performance 1970–2001," *Moody's Investors Service Special Comment* (February). Available via the Internet at: <http://www.moody.com>.
- Haque, Nadeem ul, Manmohan S. Kumar, Mark Nelson, and Donald J. Mathieson, 1996, "The Economic Content of Indicators of Developing Country Creditworthiness," *Staff Papers*, International Monetary Fund, Vol. 43 (December), pp. 688–723.
- Hilderman, Mara, 1999, "Opening the Black Box: The Rating Committee Process at Moody's," *Moody's Investors Service Rating Methodology* (January). Available via the Internet at: <http://www.moody.com>.
- International Monetary Fund, 2000, "Communiqué of the International Monetary and Financial Committee of the Board of Governors of the International Monetary Fund," September 24. Available via the Internet at: <http://www.imf.org/external/np/cm/2000/092400.htm>.

- , 2001, “Involving the Private Sector in the Resolution of Financial Crises—Restructuring International Sovereign Bonds” (Policy Development and Review Department and Legal Department: January 11). Available via the Internet at: <http://www.imf.org/external/pubs/ft/series/03/index.htm>.
- , 2002, “Sovereign Debt Restructurings and the Local Economy—Experience in Four Recent Cases” (Policy Development and Review Department: February 21). Available via the Internet at: <http://www.imf.org> (with “SDRM” as the search term).
- Johnston, Barry R., Jingqing Chai, and Liliana Schumacher, 2000, “Assessing Financial System Vulnerabilities,” IMF Working Paper 00/76 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=3546.0>.
- Juttner, J.D., and J. McCarthy, 1998, “Modelling a Ratings Crisis” (unpublished; Sydney, Australia: Macquarie University).
- Karacadag, Cem, and Virginia Manzer, 1997, “Financial System Stress and Sovereign Credit Risk,” *Standard & Poor’s Sovereign Ratings Service* (December).
- Karacadag, Cem, and Barbara C. Samuels, II, 1998, “How Markets Failed Asia,” *International Economy*, Vol. 12 (November/December), pp. 34–37.
- Keenan, Sean, 2000, “Moody’s Approach to Evaluating Distressed Exchanges,” *Moody’s Investors Service Special Comment* (July). Available via the Internet at: <http://www.moody.com>.
- Kim, Se-Jik, and Mark R. Stone, 1999, “Corporate Leverage, Bankruptcy, and Output Adjustment in Post-Crisis East Asia,” IMF Working Paper 99/143 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=3307.0>.
- Kochhar, Kalpana, Prakash Loungani, and Mark R. Stone, 1998, “The East Asian Crisis: Macroeconomic Developments and Policy Lessons,” IMF Working Paper 98/128 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=2740.0>.
- Kräussl, Roman, 2000, “Sovereign Ratings and Their Impact on Recent Financial Crises,” Center for Financial Studies (Frankfurt/Main). Available via the Internet at: http://www.ifk-cfs.de/pages/ueberu/mitarb/kraeussl/index__e.htm.
- Levey, David, 2002, “Sovereign Rating History,” *Moody’s Investors Service Special Comment* (January). Available via the Internet at: <http://www.moody.com>.

- Mah, Stephanie K., and Mariarosa Verde, 2001, "Fitch Corporate Bond Default Study: A Decade in Review," *Fitch Credit Market Research* (November 8). Available via the Internet at: <http://www.fitchratings.com/corporate/sectors>.
- Moody's Investors Service, 1997–2002 various, sovereign-specific reports and press releases on: Indonesia, Korea, Malaysia, Moldova, Romania, Russia, Thailand, and Uruguay. Available to subscribers via the Internet at: <http://www.moody.com>.
- , 1998, "Moody's Rating Record in the East Asian Financial Crisis," *Moody's Investors Service Special Comment* (May) Available to subscribers via the Internet at: <http://www.moody.com>.
- Mulder, Christian, and Roberto Perrelli, 2001, "Foreign Currency Credit Ratings for Emerging Market Economies," IMF Working Paper 01/191 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=15318.0>.
- "New interests, new conflicts," *The Economist*, April 14, 2001. Available to subscribers via the Internet at: <http://www.economist.com>.
- Reisen, Helmut, and Julia von Maltzan, 1999, "Boom and Bust and Sovereign Ratings," OECD Development Centre Technical Paper No. 148 (Paris: Organisation for Economic Cooperation and Development). Available via the Internet at: <http://www.oecd.org/dev/publication/tp1a.htm>.
- Samson, Solomon B., 2001, "Distressed Exchange Offers: Tantamount to Default," *Standard & Poor's RatingsDirect* (November 2). Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- Standard & Poor's, 1997–2002 various, sovereign-specific reports and press releases on: Argentina, Botswana, Ecuador, India, Indonesia, Korea, Malaysia, Pakistan, Romania, Russia, Thailand, and Uruguay. Available to subscribers via the Internet at: <http://www.ratingsdirect.com>.
- , 2002, *Sovereign Ratings History Since 1975* (New York). Available via the Internet at: <http://www.standardandpoors.com/RatingsActions/RatingsLists/Sovereigns>.
- Stone, Mark R., 2000, "The Corporate Sector Dynamics of Systemic Financial Crises," IMF Working Paper 00/114 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=3650.0>.
- Sy, Amadou N., 2001, "Emerging Market Bond Spreads and Sovereign Credit Ratings: Reconciling Market Views with Economic Fundamentals," IMF Working Paper 01/165 (Washington: International Monetary Fund). Available via the Internet at: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=15425.0>.

United States, Department of State, 2002, *Remarks at Sovereign Credit Rating Conference, Secretary Colin L. Powell* (Washington: April 23). Available via the Internet at: <http://www.state.gov/secretary/rm/2002/9634.htm>.

Westlake, Melvin, 2000, "Three's company," *The Banker* (December). Available via the Internet at: <http://www.thebanker.com/art2dec00.htm>.