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Sovereign credit default swaps[1]

The market for credit derivatives, or financial contracts whose payoffs are linked to changes in the credit quality of a reference asset, has expanded dramatically in recent years. According to the 2002 Credit Derivatives Report of the British Bankers' Association, the credit derivatives market grew from $40 billion outstanding notional value in 1996 to an estimated $1.2 trillion at the end of 2001, and is expected to reach $4.8 trillion by the end of 2004.[2] The same report indicates that single name credit default swaps (CDSs) accounted for roughly 45% of the overall credit derivatives market.

This note examines developments in the CDS market with a particular focus on the segments where the reference assets are sovereign obligations. Sovereign CDSs, which benefited from the standardisation of contract form and definitions in 1998 and 1999 as well as successful execution in the case of recent defaults, are considered the most liquid credit derivative instruments in emerging markets. Particularly as their liquidity increases, sovereign CDSs have the potential to supplement and increase efficiency in underlying sovereign bond markets.[3]

This special feature begins by briefly outlining the function and structure of credit default swaps. We then review the data provided by CreditTrade, one of the major trading platforms for credit derivatives, and use this as a basis for comparing sovereign with corporate and bank CDSs across a number of dimensions, including concentration of quotes by name of the reference asset, rating composition, maturity and pricing.

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[1] Chamaree Suthiphongchai was seconded to the BIS by the Bank of Thailand while this special feature was being researched. The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Bank of Thailand. The authors wish to acknowledge the invaluable assistance of Anna Cobau, and helpful comments from Jacob Gyntelberg and Haibin Zhu in the course of preparing this feature.

[2] In a more recent survey of around 200 financial institutions, Fitch Ratings (2003) identified derivatives-related sold credit protection of around $1.7 trillion.

[3] Although some work has found bid-ask spreads of the credit default swaps in the more liquid sovereign names to be 10–20 basis points, generally wider than those observed in the cash market, increasing volumes in the CDS market could narrow the differential going forward. For a detailed analysis, see Dresdner Kleinwort Wasserstein Research (2002). Earlier work on the topic is to be found in JPMorgan (2001).

Background and data source

Credit default swaps are credit protection contracts whereby one party agrees, in exchange for a periodic premium, to make a contingent payment in the case of a defined credit event. For buyers of credit protection, the CDS market offers the opportunity to reduce credit concentration and regulatory capital while maintaining customer relationships. For sellers of protection, it offers the opportunity to take credit exposure over a customised term and earn income without having to fund the position.

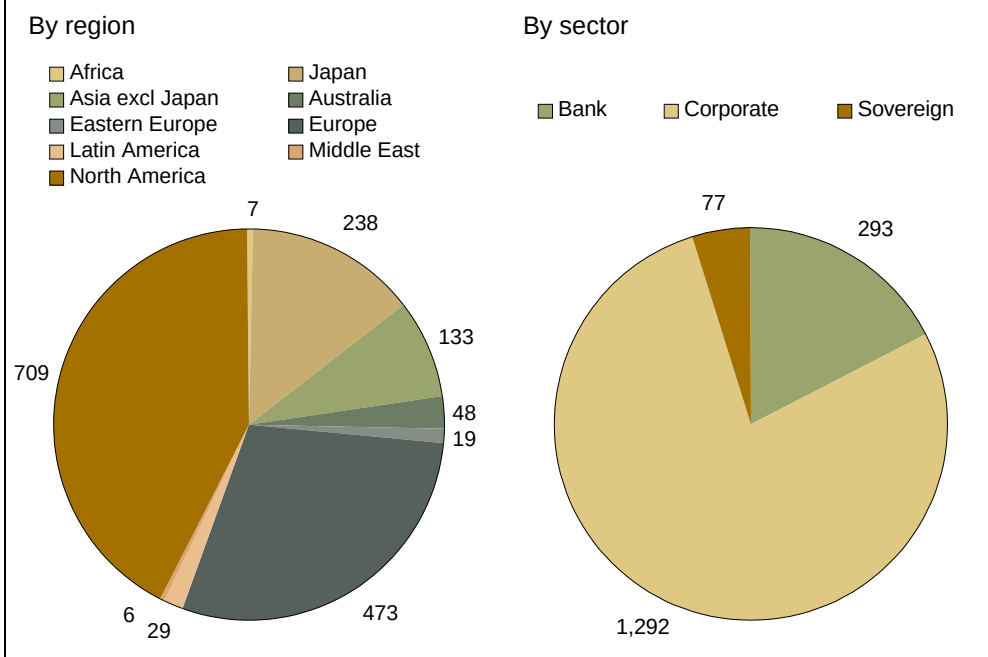
The CDS database includes dated premium quotes ...

The quoting convention for CDSs is the annual premium payment as a percentage of the notional value of the reference obligation. Under certain conditions, this CDS premium should be approximately equal to the credit spread (yield minus risk-free rates) of the reference bond of the same maturity. In addition to confirming this stylised fact, empirical work suggests that the CDS premium tracks the spread over dollar swap rates more closely than the spread over US Treasury rates.[4]

... and other characteristics of the reference asset

The main data source for this special feature is CreditTrade, a major broker in the trading of credit and credit derivatives. The company's Market Prices database lists bids and offers of brokers and traders for CDSs, as well as other characteristics of the quote and reference asset. In addition to the price (premium) in basis points, the database includes with each quote the reference entity name, the notional amount and seniority of the reference asset, whether the quote is a bid or an offer, the date of the quote, the rating by

Breakdown of CDS names (January 1997 – June 2003)



Source: CreditTrade. Graph 1

[4] See, for example, the discussions in Zhu (2003) and Hull et al (2003).

both Moody's and Standard & Poor's, maturity, and type of restructuring clause.

The database also identifies quotes that result in actual transactions through the system, and the number is not particularly large. For instance, in 2002 only 6% of quotes corresponded to actual transactions. Even so, quotes are more than indicative, since once submitted they are binding on participants. In what follows, we will use all quotes entered into the system as a metric for market activity.

In terms of chronological and geographical coverage, the database spans the period from January 1997 to June 2003, and contains slightly more than 400,000 quotes on 1,662 different reference entities from around the world. Of these entities, 1,292 are corporate names, 293 are banks and 77 are sovereigns (Graph 1).

Growth and development

Table 1 lists the overall number of quotes on CDSs reported in the database each year, classified by category of the reference asset, ie corporate, bank or sovereign. Clearly, the growth of quotes overall continues to be very strong, reaching 124% and 63.8% in 2001 and 2002, respectively. The overall number of quotes on CDSs for the first six months of 2003 was nearly 53% greater than that registered over the same period in 2002.

Quotes on sovereign CDSs are relatively few but concentrated

Within the CDS market, quotes on sovereign CDSs occupy a relatively small share, in part reflecting the far smaller number of names being traded. Sovereign CDSs accounted for around 7.4% of all quotes in 2002 and 2003 to date. Corporates account for the bulk of quotes over the same years at 78.6%, while banks account for roughly 14%. Even so, the resulting mean number of quotes per name is higher for sovereign CDSs than for the other categories, suggesting a higher degree of concentration in activity in sovereign names, as discussed further below.

Number of quotes by type of CDS

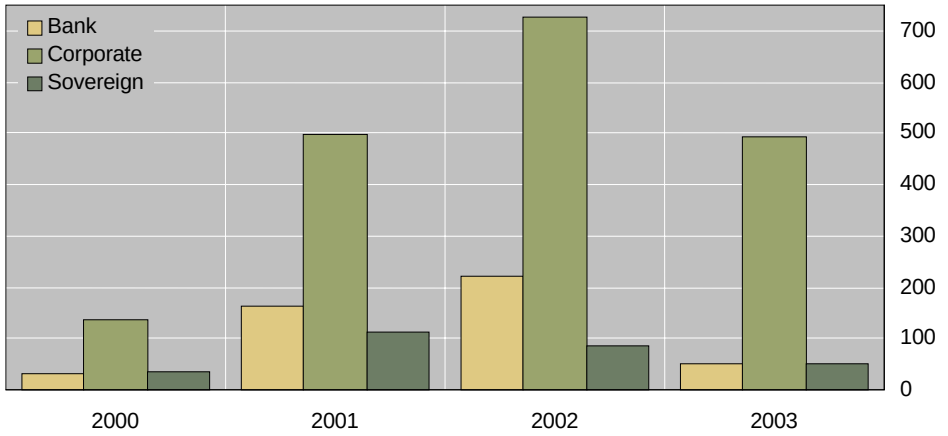
Type	Number of quotes						
	1997	1998	1999	2000	2001	2002	2003[1]
Corporate	196	1,892	11,726	22,538	55,679	102,039	88,817
Bank	394	2,715	8,021	6,854	16,844	25,490	8,615
Sovereign	771	2,283	8,169	8,133	11,535	10,124	7,844
Total	1,361	6,890	27,916	37,525	84,058	137,653	105,276
	% change of number of quotes and trades from the previous year						
Corporate	.	865.3	519.8	92.2	147.0	83.3	96.9
Bank	.	589.1	195.4	–14.5	145.8	51.3	–50.5
Sovereign	.	196.1	257.8	–0.4	41.8	–12.2	48.2
Total	.	406.2	305.2	34.4	124.0	63.8	52.9

[1] First half; change over first half of 2002.

Source: CreditTrade. Table 1

Volume of CDS contracts by exposure class

In billions of US dollars[1]



[1] Yearly sum of volume of contracts quoted on CreditTrade; for 2003, first half only.

Sources: CreditTrade; BIS calculations. Graph 2

Though the growth of sovereign CDSs has consistently been less than that of corporate CDSs, the first six months of 2003 recorded a robust 48.2% year-on-year rate of growth. This was a significant rebound from the decline in activity seen in 2002. More than one third of this decline was due to the elimination of Argentina from the list of reference entities after its default in late 2001. Most of the rest of the drop was accounted for by a fall in transactions for Asian names such as China, Korea and Thailand. However, the decline in Asian names has levelled off in 2003, while growth in other Latin American names such as Brazil and Mexico has continued.

Higher volume growth for sovereign than for bank CDSs

Similar patterns can be noted in the overall *volume* of quoted CDS contracts, where the volume is defined as the sum of available quotes multiplied by the size of the notional reference debt obligation (Graph 2). Thus defined, the volume of sovereign CDSs for the first six months of 2003 was higher than that for the first six months of 2002, although the rate of expansion was less than that for the volume of CDSs on corporate obligations. At the same time, the growth rate was well above that observed for CDS volume on bank obligations, which fell into negative territory.

Relative to the corporate sector, the concentration of quotes on sovereign CDSs by name is very marked. The five leading names are Brazil, Mexico, Japan, the Philippines and South Africa, which together account for more than 40% of listed quotes on sovereign names. The addition of Colombia and China brings the total to more than 50% (Table 2). By contrast, the top five names in corporate CDSs yield only 7.7% of all corporate quotes on CreditTrade.

The concentration of sovereign CDSs among emerging market sovereign names is for the most part consistent with the composition of TRAC-X Emerging Markets, the new credit default swap index from JPMorgan Chase and Morgan Stanley. For instance, the weighting of the top three names in the TRAC-X index, Mexico, Russia and Brazil, is slightly higher than 37%, while the most actively quoted sovereign names for 2003 in CreditTrade, Mexico, Brazil

and South Africa, comprise more than 35% of the 2003 sample. Though quotes on non-emerging market entities constitute less than 10% of the total quotes on sovereigns, one country that has had a significant presence as a reference entity in the CreditTrade data set is Japan. CDSs on Japanese bonds make up more than 6% of all observed sovereign quotes on CreditTrade during 2000–03.

Sovereign CDSs rely on the old restructuring clause

Unlike CDSs written on bank and corporate obligations, the vast majority of outstanding sovereign CDSs remain governed by the old restructuring clause of the 1999 ISDA Credit Derivatives Definitions (Graph 3). Among non-sovereign CDS contracts drafted under this clause, there had been several cases where protection buyers had claimed higher compensation than the actual losses they suffered. These unjustified claims were behind the development of a modified restructuring clause in 2001 (with further refinement in 2003). Though many protection sellers included the new clause in corporate and bank CDS contracts, CDSs on sovereign obligations do not seem to have been similarly affected. This is reportedly because the likelihood of restructuring occurring in the absence of a real deterioration in financial status is believed to be very rare in the case of sovereign CDSs. Most emerging market sovereign CDSs are bond-oriented in terms of the credit event indication and the deliverable obligation, and opportunistic restructuring is viewed as less feasible in the case of widely held bond obligations.

Concentration of quotes on sovereign CDSs

Name	Number of quotes					Percentage	Average rating[1]			
	2000	2001	2002	2003	Total		2000	2001	2002	2003
Brazil	1,080	1,352	1,293	868	4,593	12.2	B+	B+	B	B
Mexico	748	1,010	1,644	933	4,335	11.5	BBB–	BBB–	BBB	BBB
Japan	418	1,062	628	205	2,313	6.1	AA+	AA–	A+	A+
Philippines	821	740	436	209	2,206	5.9	BB+	BB+	BB+	BB
South Africa	94	518	717	683	2,012	5.3	BBB–	BBB–	BBB–	BBB
Colombia	93	345	801	556	1,795	4.8	BB	BB	BB	BB
China	743	672	140	62	1,617	4.3	BBB+	BBB+	BBB+	BBB+
Korea	533	636	138	287	1,594	4.2	BBB	BBB	A–	A–
Poland	329	388	406	420	1,543	4.1	BBB+	BBB+	A–	A–
Venezuela	155	521	497	319	1,492	4.0	B	B+	B	B
Turkey	146	471	475	380	1,472	3.9	B+	B	B–	B–
Malaysia	302	685	256	85	1,328	3.5	BBB	BBB	BBB+	BBB+
Argentina	851	461	0	6	1,318	3.5	B+	.	.	.
Thailand	494	562	121	37	1,214	3.2	BB–	BBB–	BBB–	BBB–
Russia	16	395	365	377	1,153	3.1	B–	B–	BB	BB
Other countries	1,310	1,717	2,207	2,417	7,651	20.3	.	.	.	.
All emerging markets	7,523	10,283	9,218	7,053	34,077	90.5	.	.	.	.
Total	8,133	11,535	10,124	7,844	37,636	100.0	.	.	.	.

[1] End-year average of Moody's and Standard & Poor's ratings from CreditTrade transactions. Table 2

CDS contracts by restructuring clause

As a percentage of total number of contracts

Sources: CreditTrade; BIS calculations.

Graph 3

The sovereign-linked CDSs tend to be on lower credit quality assets than the other categories of CDS. Graph 4 documents the composition of CDS volume by rating category for our three classes of reference asset.[5] Just below 40% of sovereign obligations that provide the underlying asset for CDSs are sub-investment grade (BB and below), far more than in the case of either corporate or bank reference assets. Similarly, 10–15% of the reference assets for sovereigns tend to be highly rated at AAA or AA, a smaller proportion than the 20% rates seen for bank CDSs, though larger than is the case for corporates.[6]

Sovereign CDSs tend to be of lower credit quality …

Sovereign-linked CDSs tend to have a U-shaped distribution for the maturity of their reference assets, populated by more of both long- and short-term maturity reference assets than their corporate counterparts (Graph 5). For instance, between 30 and 40% of the quoted obligations have a maturity of more than eight years, versus less than 20% for corporates and less than 10% for banks. In contrast, with the exception of 2003, there have tended to be relatively more quotes on short maturity (ie four years or less) sovereign reference assets than on corporates and banks. This latter characteristic is consistent with the relatively high proportion of lower credit quality sovereigns in the sample, which are often only able to issue at short-term maturities as a result.

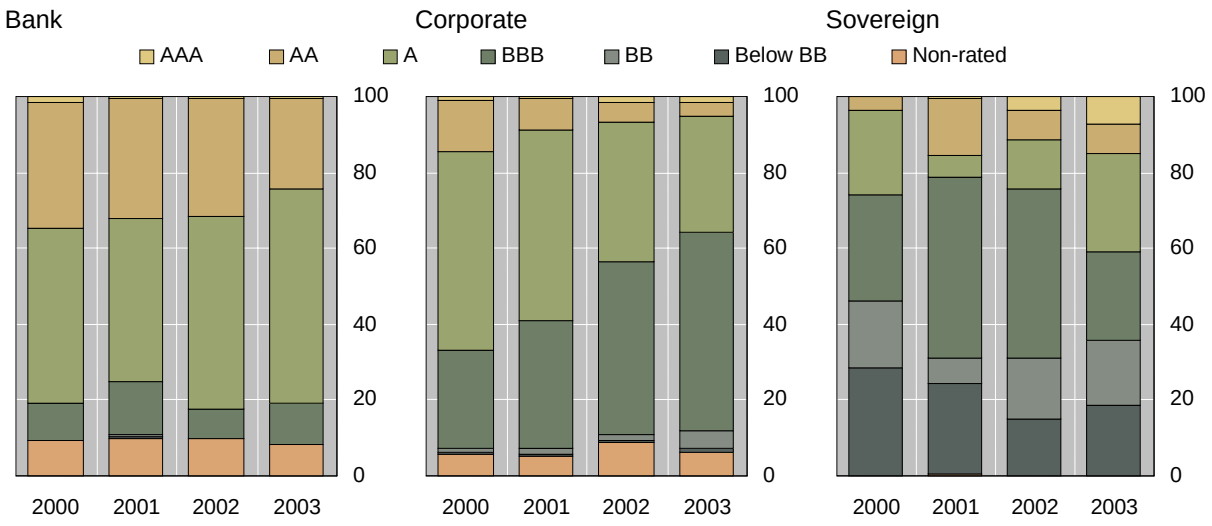
… and on shorter maturity obligations

[5] When the reference obligation has two different ratings from Moody's and Standard & Poor's, the average rating is taken.

[6] The distinction between sovereign and corporate CDSs in the investment grade category appears to have become sharper over the past few years. Among corporates, there has been a modest shift to lower investment grade reference assets (ie rated A and BBB). By contrast, the past few years have seen the introduction of quotes on very highly rated names such as France, Germany and Italy. This has compensated for the movement of Japan to the A category from AA in 2002.

CDS volumes by rating

As a percentage of total volume



Sources: CreditTrade; BIS calculations.

Graph 4

Premia on sovereign CDSs

As discussed above, the premium should roughly correspond to the spread of the reference obligation of equal maturity over the risk-free rate. For this reason, we should expect the premium to show a fairly close cross-sectional relationship with the credit risk of the underlying reference asset as measured by credit rating agencies. Indeed, there appears to be a consistently negative relationship between ratings and premia on sovereign CDSs (Graph 6).

Just as low-rated sovereign bonds tend to price at higher spreads than their corporate counterparts ...

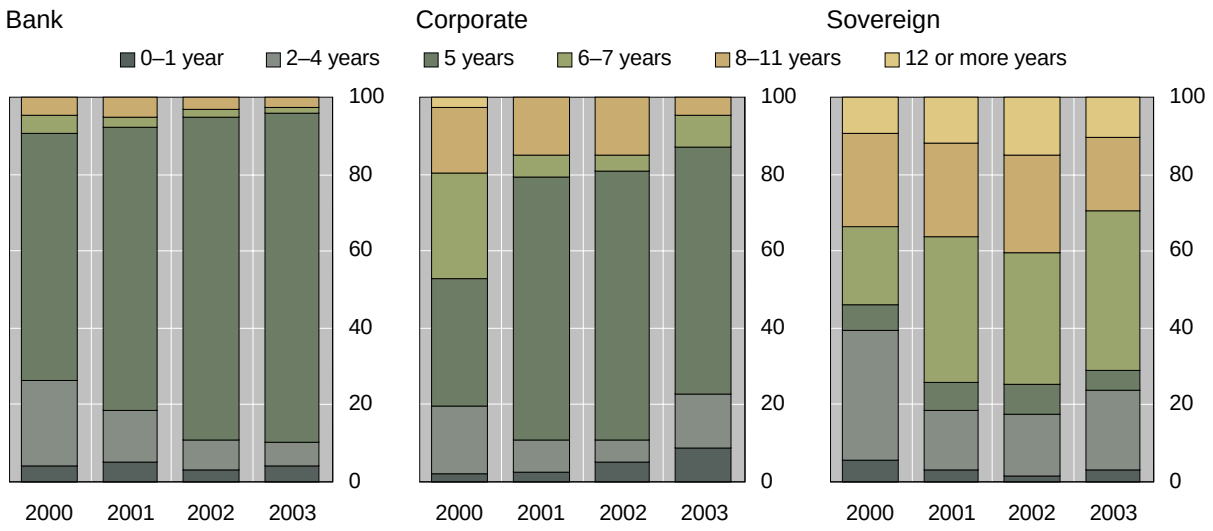
One question of interest is how the premia on sovereign CDSs might match up relative to other CDS segments, holding the credit rating constant. In the mid-1990s, Cantor and Packer (1995) documented a tendency for lower-grade sovereign bonds to be priced at wider spreads than corporate bonds. This stylised fact would still appear to hold many years later at the letter grade rating levels of B and below; the Bloomberg fair market curve is significantly higher for the US dollar sovereign B sector than the US dollar industrial B2 sector. Do we see a similar result holding for CDS premia as well? In Graph 6, we chart the monthly average CDS premia for all categories between January 2000 and June 2003 for six different rating classes.

A number of results are evident. In the upper rating classes of A or higher, quoted premia for corporate CDSs have tended to be consistently higher than those for the sovereign credits. For instance, in 2003 the spread of AAA-rated corporate-linked CDSs has been around 30 basis points over that of comparably rated sovereigns; for AA- and A-rated obligations, the average difference has been around 40 and 50 basis points, respectively.

The results may be explained by the small sample of highly rated sovereigns for which CDS quotes are available, combined with the relatively broad letter grade rating categories for which the comparisons have been

CDS volume by maturity

As a percentage of total volume



Sources: CreditTrade; BIS calculations. Graph 5

made. For instance, in the case of AAA-rated reference obligations, the two sovereigns, Germany and France, comprise virtually the entire sample of quotes. But these sovereigns arguably represent credits that would be rated over AAA were such a rating available, so that the sovereign CDSs would naturally be trading at lower premia than a sample of corporations. Similarly in the case of AA- and A-rated credits, specific characteristics of the small sample of sovereign obligations that serve as the underlying asset might explain the difference between the average premia at different rating categories.[7]

… premia on low-rated sovereign CDSs tend to be higher as well

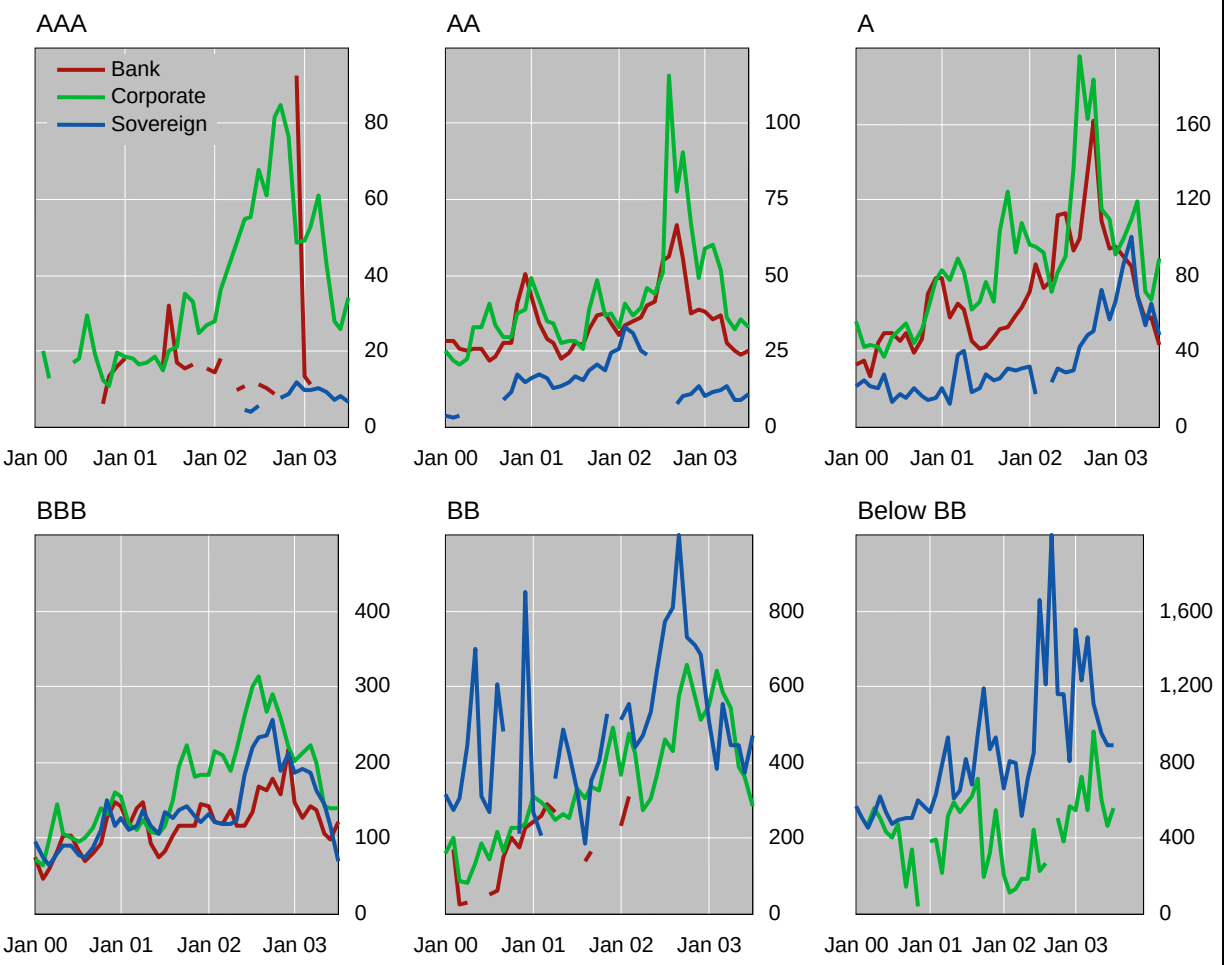
The situation changes when we move to lower grade reference assets, however. The difference between sovereigns and corporates in the premium appears to be virtually indistinguishable for the lower grade categories of BBB and BB, suggesting greater similarity in the pricing of sovereign and industrial credits than was found in the 1990s. Even so, for reference assets rated below BB, sovereign credit still appears to be priced higher, with the average sovereign premium at most times significantly above the corporate average. In the very lowest grade categories, in which countries such as Argentina, Brazil and Turkey have been prominent, the argument can be made that the market is less sure about the returns in the event of default on sovereign credits, and thus has demanded a higher premium than for similarly rated CDSs on corporate credits.[8]

[7] In the case of AA-rated reference obligations, quotes from Japan dominated in 2001 and the first half of 2002, and were replaced by Italy, Belgium and Spain in 2003. These three countries are rated AA+ and are thus at the higher end of the AA range; Japan is one case where a number of observers have suggested that the market has a more sanguine view of the country's creditworthiness than that of the major rating agencies. Similarly, the lower premia for CDSs in the A category might be explained by Japan, which had a prominent place in this category in the second half of 2002 and in 2003 subsequent to its rating agency downgrades.

[8] To check that outlying observations were not driving the outcome, we also charted the median premia for each rating and sector segment, with similar results.

Five-year CDS premia by rating

Monthly average; in basis points



Sources: CreditTrade; BIS calculations.

Graph 6

Conclusion

Sovereign CDSs constitute a minor though growing part of the CDS market. After falling off in 2002, observed quotes on sovereign CDSs have risen markedly in 2003, with more than 90% of them linked to so-called "emerging market" sovereign credits. Our examination of the quotes available for sovereign CDSs suggests that trading is more concentrated in fewer names than for corporate or bank CDSs, and also tends to be concentrated in underlying assets of relatively short maturity, which is consistent with the relative proportion of low-rated sovereigns that can only issue at short maturities.

With regard to the pricing of sovereign CDSs relative to the pricing of those written on corporate or bank obligations, there is a striking asymmetry between cases depending on whether the underlying is high- or low-rated. On the one hand, the premia for sovereign CDSs are generally lower than for similarly rated corporates at high rating levels. Whether there is a liquidity-based reason for this, or whether it is simply due to the small sample of

sovereigns and the crude grouping by letter grade rating, remains to be seen. By contrast, the mean premia for CDSs written on very low-rated sovereigns appear much higher than those for CDSs written on low-rated corporates. This result is consistent with the market being less sure about returns in the event of sovereign default.

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