Extending Default Risk to Sovereign Issues

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This paper describes our new method of calculating spread-implied default probabilities for sovereign issues. The credit risk associated with default is an essential component of the analysis and management of portfolios. The Barclays Global Risk Model in POINT® fully recognizes this risk under the Default Tracking Error Volatility (DTEV).

Given the new focus on sovereign default risk, we show how to extend our corporate spread-implied default probability model to cover sovereign issues. Sovereign spread-implied default probabilities can complement rating-implied default probabilities that are already available for sovereign issues in POINT. By default, the coverage for sovereign default probabilities includes sovereign issues and supranationals. We also offer the option to include treasury and agencies securities issued in G9 currencies.

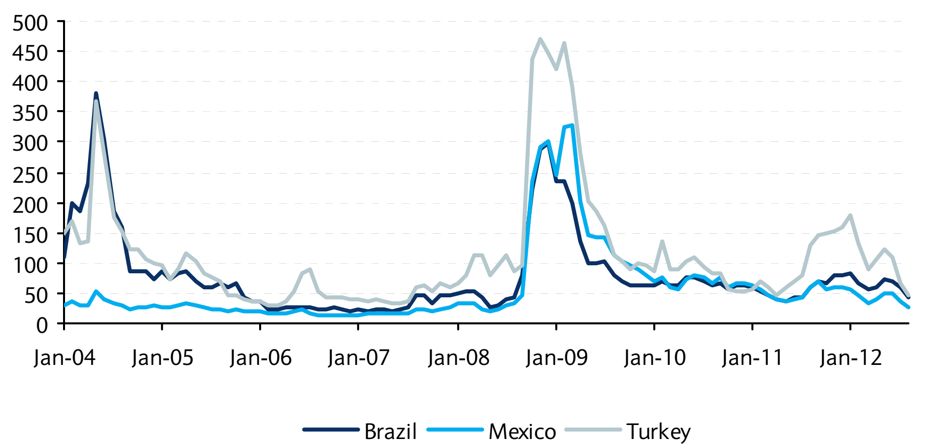
Introduction

Historically, sovereign default risk was associated with emerging market (EM) external debt. Figure 1 shows the CDS spreads for three emerging economies between January 2004 and August 2012. The spreads can vary substantially over time and across countries. In this example, the spreads are between 14bp and 450bp. The spread widening across all countries between mid 2008 and mid 2009 indicates that the spreads are tied to the economic cycle/sentiment. However there are events that are specific to particular countries as it was the case in Brazil during the election in 2004.

Large, developed countries, such as the G10 economies or the Euro countries, were historically seen as almost free of default risk. Figure 2 shows the CDS spreads for four Euro countries: France, Germany, Italy and Spain. Between 2004 and the beginning of 2008, these countries were priced to carry almost no default risk and CDS spreads traded in low single digits. Given current spread levels, this may not be surprising for countries such as Germany or France; however, this was also the case for Italy and Spain, as well as for Ireland and Portugal (not shown). Moreover, there was very little distinction between the countries. In fact there were times between 2005 and 2007 when Spain traded at lower CDS spreads than Germany. Keep in mind that Spain entered the credit crisis with debt to GDP levels that were approximately half of the German debt to GPD levels. This example is not unique to Euro countries, it also extends to other developed countries, such as the US, UK, or Japan.

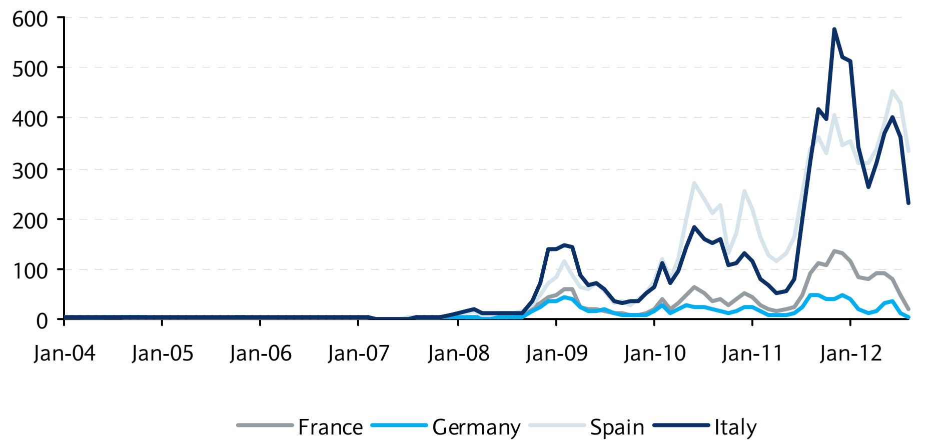
From late 2007, the pricing of default risk for developed countries changed rapidly. For some countries that the CDS market perceived as safe, spreads increased from low single digits to double or even triple digits. For example, the sovereign CDS spreads for France widened to over 130bp in 2011. For countries that were perceived less safe by the CDS market, such as Spain or Italy, spreads widened to levels above 450bp and 550bp, respectively. For European countries perceived as even less safe, such as Ireland or Portugal, credit spreads exceeded 1,000bp. We find this evolution remarkable, considering that all these countries were trading at low single-digit spreads just a few years prior.

Figure 1: CDS Spreads EM Countries (bp)



Source: Barclays Research, MarkIt

Figure 2: CDS Spreads Euro Countries (bp)



Source: Barclays Research, MarkIt

Given the new focus on sovereign default risk, we show how to extend our corporate spread-implied default probability model to cover sovereign issues. Sovereign spread-implied default probabilities can complement rating-implied default probabilities already available for sovereign issues in POINT. Both are now available to be used in the Global Risk Model in a flexible way.

POINT offers three corporate default probabilities: fundamental, spread-implied, and rating-implied. Fundamental default probabilities reflect the equity market's perception of the firm's default risk. It is calibrated using a very large historical set of companies and defaults. Because of both the lack of a robust fundamental valuation model for countries and the small number of independent sovereigns and defaults we could use to calibrate a fundamental model, there are no robust ways to model fundamental-based sovereign default probabilities. Therefore, we focus our attention instead on the other two sources for this analytic: spread-implied and rating-implied sovereign default probabilities.

Agency ratings are based on variables that the agencies deem to be important. They are through-the-cycle measures with the intent of stability; ie, they tend to be sticky. Rating-implied default probabilities inherit these characteristics. In particular, rating-implied default probabilities are no point-in-time measures of default risk and tend to be stable over time.

By contrast, spread-implied default probabilities reflect the credit market's perception of default risk and can change faster with spreads. Credit spreads, cash or CDS spreads, are not direct measures of default risk. Instead, they can be broken down into a default and a non-default component. The default component or expected loss can be approximated by the product of default probability and loss given default (LGD). The non-default component can be further broken down; for example, into a liquidity component and a risk premium. In this publication, we assume that the non-default component of credit spreads is due purely to the risk premium. Moreover, we assume that we know the LGD of each security. Therefore, if we specifically model the risk premium, we can back out the actual default probabilities from credit spreads. This is the procedure we detail in this paper.

The new sovereign spread-implied default probabilities have the same interpretation as our fundamental default probabilities. They are physical default probabilities and thus can be used directly for risk-management purposes.

Model

In this section we show how to extend our corporate spread-implied default probability model to cover sovereign issues. Sovereign spread-implied default probabilities can complement rating-implied default probabilities, which are already available for some sovereign issues in POINT (we discuss coverage later in this note). The new sovereign spread-implied default probabilities have the same interpretation as our fundamental ones. They are physical default probabilities and thus can be used directly for risk management applications.

Credit spreads are not direct measures of default risk. Besides the probability of default, credit spreads contain a part that is due to loss given default (LGD) and a risk premium part (which we choose to ignore). In this decomposition we split the credit spread into a default and a non-default or risk premium part. While we can infer risk-neutral default probabilities directly from credit spreads, our aim is to construct an empirical relationship between credit spreads and physical (not risk-neutral) default probabilities. The name "risk-neutral" default probability is slightly misleading. A better name would be risk-adjusted default probability, since these default probabilities are adjusted (upwards) by a risk premium. There are three parts to the relationship: (i) risk-neutral default probabilities, (ii) physical or actual default probabilities, and (iii) risk premium (Figure 3). Given any two of these, we can determine the third.

To extract physical default probabilities from spreads for sovereign bonds, we use the relationships found in the corporate markets. Therefore, we start by discussing our approach on the corporate side.

Figure 3: Risk-neutral and physical default probabilities

Source: Barclays Research

Spread-implied Default Probabilities for Corporate Issues

There are two steps in our corporate spread-implied default probability model. In the first, we use the credit spreads to model risk-neutral default probabilities. In the second we model the risk premium and transform risk-neutral default probabilities into actual default probabilities.

Credit spreads compensate the investor for expected losses. The spread is approximately equal to the product of the risk-neutral (RN) default probability and LGD[1]:

$$spread_{t,T} \approx DP_{t,T}^{RN} \times LGD.$$

We can rearrange this equation to back out the spread-implied risk-neutral default probability:

$$DP_{t,T}^{RN} \approx \frac{spread_{t,T}}{LGD}.$$

The LGD is equal to one minus the recovery rate; ie, it is the percentage loss relative to par. Asvanunt and Staal (2009b) developed a model to estimate the recovery rates for corporate

[1] We assume that LGD is identical under the risk-neutral and the physical measure; ie, LGD carries no risk premium.

issues based on the seniority of the issue and the industry of the issuer. This is the model we apply in this study.

The default probabilities depend on the time horizon or, in other words, the term structure of default risk. We are interested in calculating annual, physical default probabilities. We can use bonds with one year to maturity or we can annualize the risk-neutral default probabilities of longer-dated bonds. We use a combination of the two. We restrict the maturities to relatively close to one year and then annualize the default probabilities under the assumption of a flat term structure of default risk. Having backed out annual, risk-neutral, default probabilities we have completed the first step of the procedure described above.

In the second step, we model the risk premium to transform the risk-neutral default probability into a physical (also called actual or natural) default probability. If we have both the risk-neutral and the physical default probabilities, we can back out the default risk premium. For corporate issuers, we developed a model for fundamental or physical default probabilities, see Asvanunt and Staal (2009a). We use the subset of corporate bonds for which we have both the natural (fundamental-based) and the risk-neutral (spread-based) default probabilities to construct a mapping between risk-neutral and actual default probabilities. We model this mapping of the risk premium as a non-linear function of the risk-neutral and physical default probabilities[2]:

$$Risk\ \Pr emium_t = f_t\left(DP_t^{RN}, DP_t^{PH}\right)$$

The mapping is a non-linear function of the level of the default risk given by the observed spread. We estimate this relationship over time to account for time-varying risk premia. If we assume that the relationship or risk premium between risk-neutral and physical default probabilities is similar for all firms or instruments, we can back out physical default probabilities based on credit spreads for all those firms.

The risk premium we use throughout this note is calibrated for the universe composed of US industrial, senior unsecured corporate bonds. We use our conditional recovery model, developed in Asvanunt and Staal (2009b), to determine the corporate bond's LGD. Furthermore, we choose the issues that have maturities that between nine months and five years. Finally, we make adjustments such that the risk premium is annualized.

Spread-implied Default Probabilities for Sovereign Issues

The idea of backing out physical default probabilities for sovereign issues follows the same simple two-step procedure described above. The only difference is that for sovereigns we do not have fundamental default probabilities, as previously discussed. Therefore, in the second step, we directly use the risk premium extracted from the credit markets. We detail this procedure below.

Sovereign Credit Spreads

We use sovereign CDS spreads provided by MarkIt. This dataset is based on quotes from major contributing CDS dealers. The standard CDS contract for sovereign issues shares many but not all features with CDS contracts for corporate issues. For sovereign CDS contracts, physical delivery is predominant. Typically, only bonds issued in external currencies and denominated in one of the standard specified currencies[3] are deliverable,

[2] This is a very simplified version. The functional form depends on many more variables such as the recovery rate, region, industry, time to maturity, and subordination. We take this into account in our calculation, however, we simplify the exposition in this publication for the sake of clarity.
[3] The standard specified currencies are USD, EUR, GBP, JPY, CAD, and CHF.

whereas bonds denominated in local currency are in general not deliverable. Credit events for sovereigns include obligation acceleration, failure to pay, restructuring and repudiation or moratorium. Default is not part of this list since there is no operable bankruptcy court for sovereigns. Whereas the corporate CDS market is largely focused on the five-year contract, the sovereign market is more diversified across maturities.

The CDS spreads depend on the doc clause, currency, tier and tenure. There are four main doc clauses: (i) CR (full-restructuring), (ii) MM (modified-modified), (iii) MR (modified-restructuring), and (iv) XR (no-restructuring). The doc clause determines what is considered a credit event and the admissible bonds that are eligible for delivery; ie, the doc clause directly affects the probability of default and the LGD. For sovereign issues the full-restructuring doc clause is the most popular. This is not surprising given that, for sovereign issues most economic losses stem from restructuring events. Because the doc clause is static, the effect on the spreads is approximately deterministic. For countries for which we do not have full-restructuring doc clauses, we transform the CDS spreads into full-restructuring equivalent CDS spreads by applying a multiplier. The whole analysis here is performed under the assumption of the full-restructuring doc clause.

Applying the Model to Sovereign Issues

The first step in applying our model to sovereign issues is to extract the risk-neutral probability of default from spreads. Specifically, for this step we use spreads from senior unsecured, USD CDS contracts with 1 year tenor[4]. Using the 1 year tenor eliminates the need to use a term structure model to annualize risk-neutral default probabilities. The market convention for LGD is 75% for sovereigns. We use this convention throughout this analysis. With these inputs, we can calculate the risk-neutral sovereign default probabilities.

In the second step we have to extract the risk premium. Since there have not been many default events for sovereign issues in the past two decades – and that the set of sovereigns at any time is so limited – there are no robust ways to estimate fundamental default probabilities for sovereign issues. Without fundamental default probabilities for sovereigns we cannot directly back out the risk premium in the sovereign market. Therefore, we assume that the mapping between physical and risk-neutral default probabilities is similar for corporate and sovereign issues. This is a strong though necessary assumption. With this assumption, we can use the corporate risk premium along with the sovereign risk-neutral default probabilities to back out physical default probabilities for the sovereigns.

Implementation in POINT

Currently we calibrate more than 50 sovereign spread-implied default probabilities every month. These are now available in POINT. We also provide rating-implied default probabilities for countries with a sovereign rating. Figure 4 shows these analytics in POINT for a portfolio of sovereign securities. The fields 'DPSpreadImplied' and 'DPRatingImplied' show the spread-implied and the rating-implied sovereign default probabilities, respectively. For example, the spread- and rating-implied sovereign default probabilities for Brazil are 3.6bp/year and 14.5bp/year, respectively. For Uruguay, we do not have a spread-implied default probability, so the corresponding field is empty.

Sovereign default probabilities can also now be used as inputs in the Global Risk Model in POINT. They may be flexibly integrated into our Default Risk analysis. The different options are shown in Figure 5 (under the "*Model Input*" tab in the risk report). In the 'Default Probability Hierarchy' panel we add a 'Government' column, so users can choose for this

[4] The exception is the US for which we use EUR contracts.

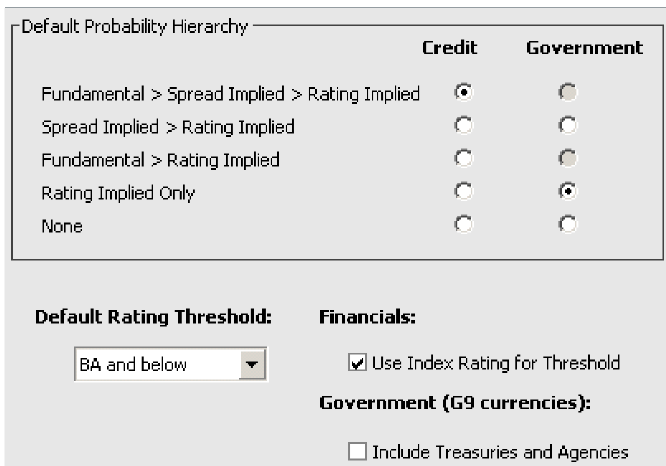
universe a different hierarchy than the one used for corporates. The hierarchy options for Government securities are threefold: use spread-implied sovereign default probabilities (when available); use rating-implied default probabilities only; or skip sovereign default risk altogether. By default, the coverage for sovereign default probabilities includes sovereign issues (external debt) and supranationals. We also offer the option to include in the analysis local currency treasury and agencies securities issued in G9 currencies[5]. We exclude this local currency option for non-G9 currencies since we believe that default risk for (local currency) treasuries and agencies for non G9 currencies is captured instead via FX or inflation risk factors. This reflects the fact that countries can always print money to avoid defaulting on local currency issuance. This would typically lead to higher inflation and currency devaluation. Figure 5 shows that this option is unchecked by default[6].

Figure 4: Sovereign Default Probabilities in POINT

Identifier	Description	Maturity Date	DPSpreadImplied	DPRatingImplied	Sovereign Rating △
XS0203685788	PEOPLE'S REPUBLIC OF CHINA	10/28/2014	0.000089	0.000300	AA3
50064FAF	KOREA REPUBLIC OF - GLOBAL	12/7/2016	0.000094	0.000300	AA3
46513EHJ	ISRAEL STATE OF-GLOBAL	3/1/2014	0.000585	0.000500	A1
105756BH	BRAZIL (FED REP OF)-GLOBAL	1/15/2018	0.000355	0.001448	BAA2
917288BA	REPUBLICA ORIENT URUGUAY	1/15/2033		0.001448	BAA3

Source: Barclays Research, POINT

Figure 5: Sovereign Default Risk: Model Input



Source: Barclays Research, POINT

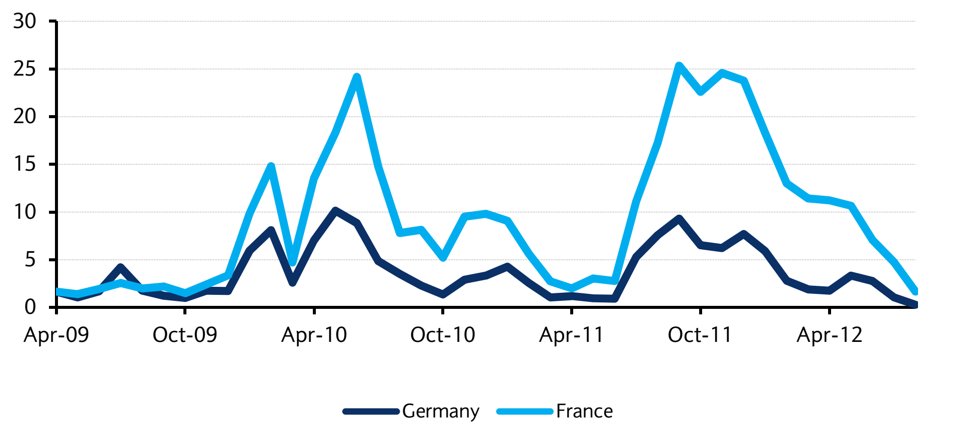
Empirical Performance

It is hard to test the performance of sovereign default probabilities given the rarity of sovereign defaults. However, we can validate sovereign default probabilities by comparing countries' relative rankings or by comparing spread-implied and rating-implied sovereign default probabilities to check that the levels are sensible. Finally, corporate default probabilities should generally be at least as high as sovereign default probabilities for their country or region.

[5] We define G9 currencies as USD, EUR, GBP, JPY, CAD, CHF, DKK, NOK, and SEK. Treasuries and agencies are defined in POINT based on the "Class 4 Code" starting with "A", "BA", or "BB".
[6] The other panels in this figure are explained in Schuehle (2012), details on the calculation of the default tracking error volatility (DTEV) can be found in Schuehle (2011).

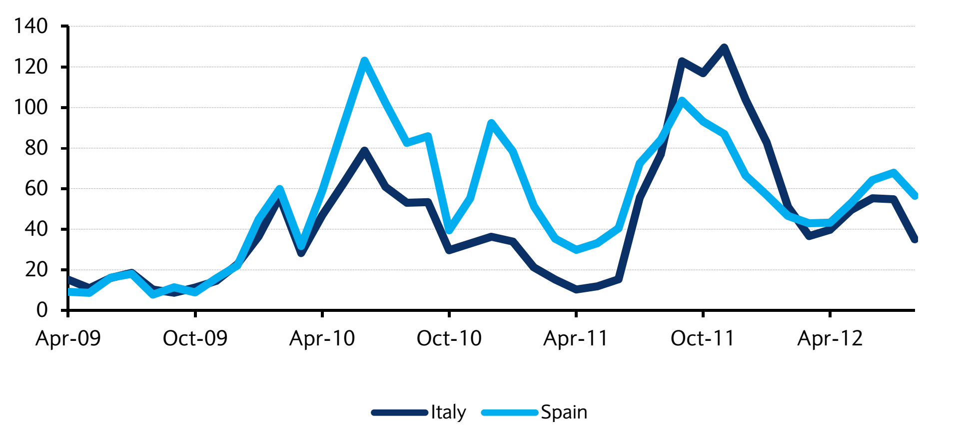
Figure 6 shows the spread-implied sovereign default probabilities used in POINT for Germany and France. Germany is often perceived as one of the countries with very low default risk. The figure shows that even countries perceived to be among the safest do carry some default risk. In Germany's case, the default probability reached highs around 10bp between April 2009 and August 2012. We can interpret this number in the following way: If we had 10,000 countries with characteristics and default probabilities identical to Germany's, we would expect 10 defaults over the next year. France has similar patterns of default probabilities. However, the level for France is higher – approximately 25bp. At these levels, we can also conclude that the safest sovereign spread-implied default probabilities are comparable to the safest corporate default probabilities. For example, in the US AGG, fewer than 10 companies have lower spread-implied default probabilities than the US sovereign.

Figure 6: Sovereign Spread-Implied Default Probabilities (bp)



Source: Barclays Research

Figure 7: Sovereign Spread-Implied Default Probabilities (bp)

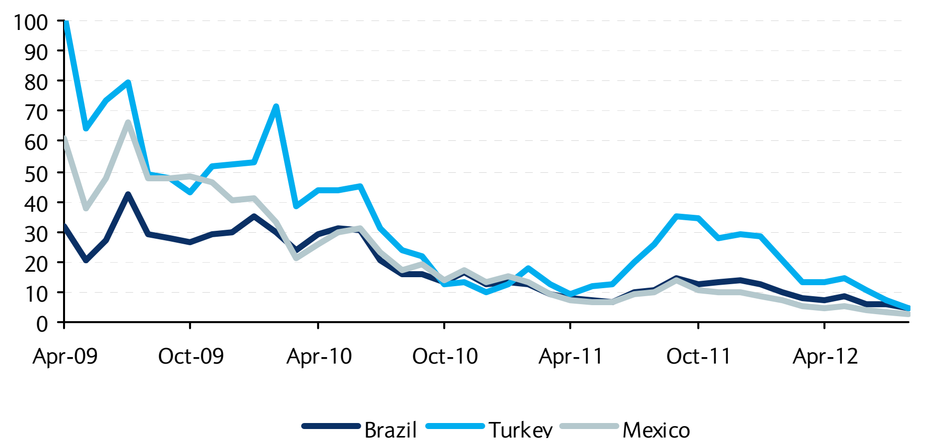


Source: Barclays Research

Evidence from France and Germany contrasts starkly with that from Italy and Spain (Figure 7). Although the patterns of default probabilities between France/Germany, on the one hand and Italy/Spain, on the other, are similar, they differ significantly in terms of magnitude. Figure 7 shows that both Italy and Spain reach highs exceeding 120bp in their default probability. They had almost identical spread-implied default probabilities going into the European crisis. Moreover, between April 2009 and late 2010, both countries' default probabilities increased, from approximately 15bp to approximately 60bp. During this period, the market was more focused on other European countries (eg, Greece, Ireland and Portugal), but in early 2010, the market concerns reached Spain and Italy, too, albeit with different dynamics (Figure 7).

Figure 8 shows the sovereign spread-implied default probabilities for three EM countries: Brazil, Turkey, and Mexico. The pattern for these three countries differs substantially from that of the European countries. The three EM countries started off with high default probabilities in the immediate aftermath of the credit crisis. Since April 2009, the default probabilities for the three countries have tightened drastically, to below 10bp in mid-2012. In August 2012, the default probabilities for the three countries were approximately 2-3 times that of France, but significantly below those implied for European peripheral countries.

Figure 8: Sovereign Spread-Implied Default Probabilities (bp)



Source: Barclays Research

Spread-implied vs Rating-implied Sovereign Default Probabilities

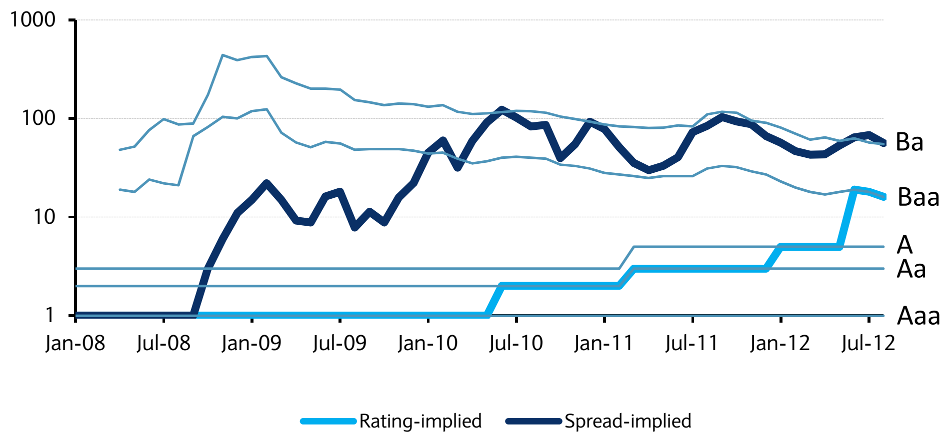
One advantage of spread-implied over rating-implied default probabilities is that they are point-in-time measures of default risk that reflect current information in the credit markets. Credit spreads can adjust very quickly as new information becomes available or sentiment changes. Credit ratings, on the other hand are more of a through-the-cycle measure with the intent of stability. In other words, ratings tend to be sticky and infrequently revised. Rating-implied default probabilities inherit the traits and characteristics of the ratings. They are more stable over time and do not always contain the most up-to-date information. They may also be considered less prone to market noise. We see these two default probabilities as complementary; the user should decide which one is more suitable for purpose.

To illustrate, Figure 9 shows the spread-implied and rating-implied sovereign default probabilities available in POINT for Spain. We also show the evolution of the rating-implied default probabilities for the rating classes between Aaa and Ba. The figure uses a log-scale for easy comparison. Between January 2008 and August 2012 Spain was subject to three major downgrades.[7] In the first half of 2010, Spain was downgraded from Aaa to Aa, in early 2012 to A, and in the first half of 2012 to Baa. This demonstrates that ratings are relatively stable over time (in a sequence of downgrades, they often occur with increasing speed as the situation deteriorates). The spread-implied default probability paints a different picture. In the second half of 2008, the default probability increased markedly, more than 1.5 years before the rating-implied one did. From early 2010, the spread-implied default probability for Spain entered the

[7] In this model we consider only major rating classes Aaa to B, as well as the combined rating class Caa-C. Specifically, this data can be seen under the POINT field 'Sovereign Rating'.

range that is equivalent to a Baa and Ba rating-implied default probability. This was more than two years before Spain's actual rating was downgraded to an equivalent level. This analysis showcases the point-in-time nature of the spread-implied default probabilities and the relative stability of the rating-implied default probability. It also shows how different the results of the two approaches can be. The user is advised to use both in a complementary way, depending on the particular analysis and portfolio under consideration.

Figure 9: Sovereign Spread-Implied vs Rating-Implied Default Probabilities – Spain (bp)



Source: Barclays Research

Conclusion

Credit risk associated with default is an essential component of the analysis and management of portfolios. The Barclays Global Risk Model in POINT® fully recognizes this risk under the Default Tracking Error Volatility (DTEV). In this note, we describe how we extend in POINT the default risk coverage from corporate credit to include sovereign securities.

Given the new focus on sovereign default risk, we show how to extend our corporate spread-implied default probability model to sovereign issues. Sovereign spread-implied default probabilities can complement rating-implied default probabilities that are already available for sovereign issues in POINT. By default, the coverage for sovereign default probabilities includes sovereign issues and supranationals. We also offer the option to include local-currency treasury and agencies securities issued in G9 currencies.

References

Asvanunt, A. and Staal, A. (2009a), "The Corporate Default Probability model in the Barclays Capital POINT platform (POINT CDP)", Barclays Capital, April 2009

Asvanunt, A. and Staal, A. (2009b), "The POINT Conditional Recovery Rate (CRR) Model", Barclays Capital, August 2009

Schuehle, N. (2011), "Default Tracking Error Volatility Glossary", Barclays Capital, September 2011

Schuehle, N. (2012), "A Note on Changes to the Default Risk Model in POINT", Barclays, August 2012

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