Cyclical Considerations in Valuing Emerging Markets Debt

ALEXANDER V. KOZHEMIAKIN

ALEXANDER V. KOZHEMIAKIN
is Senior Vice President and Emerging Markets Debt Portfolio Manager, Putnam Investments, Boston, MA.
alexander_kozhemiakin@putnam.com

For a long time, the paucity of data pertaining to emerging markets (EM) debt hindered relative value comparisons of EM sovereign and high-yield (HY) corporate bonds. Even today, after more than a decade of rapidly expanding sovereign debt issuance, there are only approximately 100 countries with rated bonds, and many of these are solidly investment grade. In contrast, there are nearly 1,000 corporations in major HY indices. The smaller size of the universe of rated sovereign issuers is not surprising, given the limited number of countries in the world.

However, as a more detailed history of sovereign ratings is accumulated over time, comparative observations become possible. Thus, according to a growing body of recent research, the available historical data on default frequencies, recovery rates, and ratings transition probabilities suggest that, on average, similarly rated EM sovereign and HY corporate bonds are quite comparable in their actual creditworthiness (Kozhemiakin [2005]; Chambers and Alexeeva [2004]; Varma et al. [2003]). In particular, for both Moody's and Standard & Poor's, average historical one-year default rates of speculative-grade sovereign and corporate issuers with the same rating are very similar.

The finding that similarly rated EM sovereign and HY corporate bonds have similar credit quality produces a simple yet powerful tool for determining intermarket relative value. If one makes proper adjustments for differences in technicals, liquidity, and duration, then similarly rated sovereign and corporate bonds should, on average, trade at similar spreads over U.S. Treasuries. In other words, *ceteris paribus*, if sovereign bonds trade at tighter spreads than their comparably rated corporate counterparts, it is an indication that EM debt is overvalued relative to HY. Conversely, if sovereign spreads are wider, as they have tended to be historically, EM bonds are undervalued relative to comparably rated corporate issues. An increasing number of EM portfolio managers describe the persistent positive spread differentials between similarly rated HY and EM bonds as an investment opportunity just waiting to be arbitraged away.

The argument that similarly rated sovereign and corporate bonds should trade at similar spreads is based on the assumption that macroeconomic cycles affecting the creditworthiness of EM sovereign and HY corporate bonds coincide. This assumption is critical and should not be taken for granted, because, as I will demonstrate, for a given speculative-grade credit rating, the annual default probabilities and hence the required spreads can vary widely depending on the stage of the macro cycle. Consequently, if the EM and HY macro cycles do not coincide as assumed, it is quite possible for similarly rated sovereign and corporate bonds to trade at different spread levels and still be fairly valued relative to each other or to trade at similar spreads and represent vastly different values.

This article probes the assumption of synchronicity of the EM and HY macroeconomic cycles. For HY corporate bonds, the relevant macro cycle is simply the growth cycle of the country in which their issuers operate. As the vast majority of corporations in the HY

universe are located in the United States, we will focus on variations in U.S. economic growth. The EM cycle, in contrast, is an aggregation of the growth cycles of individual EM countries. The growth rates of individual EM may or may not be correlated with one another. The higher the correlation among them, the greater will be the variability in the aggregate EM macro cycle.

I start by exploring generally how fluctuations in annual default rates affect the valuation of risky corporate and sovereign bonds, as reflected by their credit spreads. I then link fluctuations in annual default rates in both HY and EM to their respective macro cycles. In particular, I observe that annual default rates of speculative-grade corporate bonds vary with the macro cycle even when their credit ratings stay the same. Subsequently, I examine the extent to which the EM and HY macro cycles are intertwined. In conclusion, I consider the cyclical positions of the two asset classes at the time of writing (April 2005) to arrive at a better understanding of their relative value.

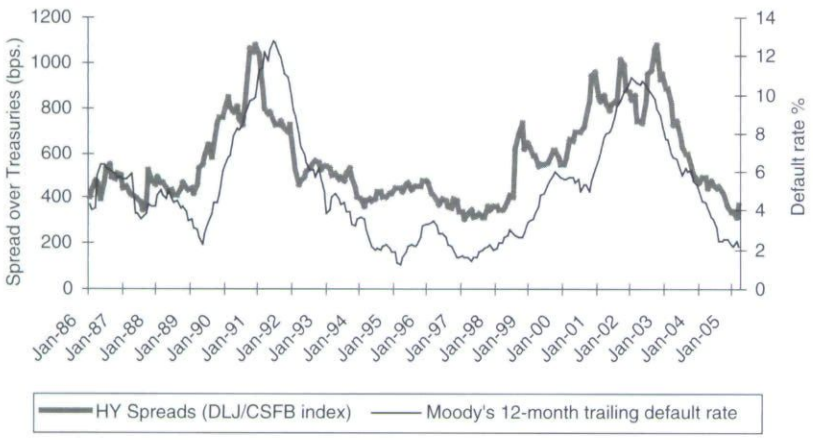
DEFAULT RATE FLUCTUATIONS AND CREDIT SPREADS

Fluctuations in annual default rates have important consequences for the valuation of risky credits. Exhibit 1 illustrates how closely spreads on the Credit Suisse First Boston HY Index (formerly the Donaldson, Lufkin & Jenrette HY Index) have tracked the Moody's 12-month trailing global issuer-weighted speculative-grade default rates for the past two decades. In this period, covering 2 recessions (1990–1991, 2001), spread moves have been quite pronounced, with spreads rising to approximately 1,000 bp when default rates were at or close to their peak and falling all the way down to nearly 300 bps when default rates were at their cyclical trough. A good fit between the 2 series (Rsq adj. = 0.62) and the wide fluctuations in spread strongly suggest that market participants tend to extrapolate from the most recent past, forecasting low default rates when recent default rates are low and anticipating high future default rates when recent rates are high.[1]

But even if the market were to avoid such overshooting by seeing clearly through fluctuations in annual default rates, credit spreads would probably still vary depending on the phase of the default cycle. Consider, for example, two bonds that are absolutely identical except for their term structures of default for the next two years. Let us say that the first bond's probability of default in the first year is higher than that of the second bond. Assuming that both bonds have coupons (a safe assumption in both HY and EM), even if the respective annual default probabilities of the two bonds are reversed during the second year, *ceteris paribus* the second bond would still be more valuable as it offers a better expected cash flow than the first one. Both bonds have the same average annual default probability over the two-year period under consideration. However, the second bond has a higher chance of not defaulting for a longer period of time, thus enabling its holder to clip coupons for that longer time. In general, the difference in the valuation of the two bonds rises with an increase in their coupon and the difference between the two default rates. In addition, the longer it takes for the default rate cycles of the two bonds to reverse, the more pronounced would be the difference in spreads. The cycles may reverse, for example, in two or more years instead of one.

Thus, although sovereign and corporate bonds with the same credit rating have similar average default rates, they may trade at different spread levels if their respective term structures of default are not the same. The difference in spreads arises because of investor psychology as well as the simple bond math. All else equal, the market would assign higher valuations or tighter spreads to bonds that have

EXHIBIT 1
HY Index Spreads versus Moody's Speculative-Grade Default Rates



Source: CSFB, Moody's.

an upward-sloping expected term structure of default with lower annual default rates in the short run and higher annual default rates in the long run.

CYCLICALITY OF CORPORATE DEFAULT RATES

So why do annual default rates vary? Corporate defaults rise in recessions and fall during economic expansions. A recession depresses, and an expansion raises, revenues of levered corporations. Yet many corporate operating and debt-servicing costs remain fixed. As a result, annual default rates fluctuate with the macro cycle.

A commonly articulated alternative explanation of the variability in annual default rates takes a more micro view by describing a phenomenon known as the "aging effect" (e.g., Jonsson and Fridson [1996]). It notes that a corporation is least likely to default in the period immediately following its bond issue, when it is flush with cash.[2] With time, as the corporation burns through its bond proceeds while its business remains vulnerable to adverse events, the marginal probability of default rises. Consequently, annual default rates increase a couple of years after the issuance boom.

The "aging effect" argument is not inconsistent with a view that default rates are primarily driven by the macro cycle. As a matter of fact, issuance patterns track the macro cycle. A cyclical peak in bond issuance tends to follow an improvement in the macro environment. When an economic expansion matures, investors become more risk accepting, and even the least creditworthy corporations find it easier to obtain financing. Issuance explodes and annual default rates plunge. It typically takes a couple of years for the cycle to turn sour again on the back of overinvestment and other excesses. Once in a recession, a challenging macro outlook is further aggravated by skittish capital markets that may even close to the most levered issuers. Financing costs go up and so do annual default rates.

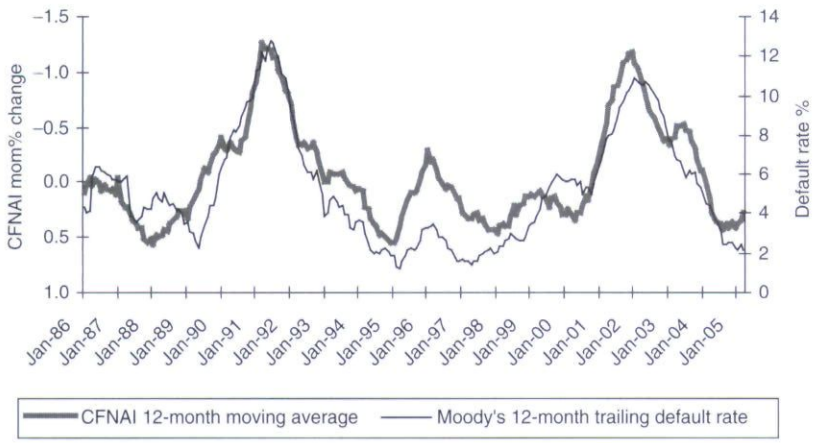
Exhibit 2 illustrates the relationship between annual default rates and the macro cycle. It plots the Moody's 12-month trailing global issuer-weighted speculative-grade corporate default rate against the pace of economic growth in the United States, as measured by the 12-month moving average of the Chicago Fed National Activity Index (CFNAI).[3] The relationship is quite strong, with the CFNAI, a monthly GDP proxy, explaining about three-quarters of the variation in the default rate since January 1986.[4]

As far as credit ratings are concerned, there are two reasons why annual default rates of speculative-grade corporate bonds rise in recessions. First, as one would expect, unfavorable economic conditions lead to credit downgrades. The HY universe, as a whole, becomes lower rated. Lower-rated bonds, in turn, have a higher average annual propensity to default. Second, even within the same ratings categories, annual default rates rise as well. It is easy to see why this is the case if we examine how annual default rates are calculated using a dynamic cohorts-based approach (Hamilton et al. [2004]). Cohorts of issuers holding a given credit rating are formed at the beginning of the measurement period and tracked for the subsequent 12 months. Thus, for example, if a credit that is rated Ba2 at the beginning of the tracking period first gets downgraded to B2 and then defaults within a year, the default would be counted in the Ba2, and not in the B2, ratings bucket. Conversely, the speculative-grade default rate falls in economic expansions, not only because of improving credit quality, as reflected in ratings upgrades, but also due to a lower annual propensity to default of bonds at any given credit rating.

The major ratings agencies appear to use a "through-the-cycle" approach that

EXHIBIT 2

Moody's Speculative-Grade Corporate Default Rates versus the CFNAI



Source: Moody's, Federal Reserve Bank of Chicago.

further reinforces fluctuations in annual default rates within the same category of bond ratings. In this approach, the agencies adjust credit ratings only in response to changes in long-term prospects (Altman and Rijken [2004]). Consequently, bond ratings are more stable than their underlying creditworthiness. It is, therefore, quite reasonable to expect cyclical fluctuations in annual default rates even if bond ratings stay the same. This is quite consistent with the recent finding that at least in the case of Moody's, the more nimble conditional ratings incorporating an issuer's rating outlook (positive, negative, stable) and rating review status (review for upgrade or downgrade) do a better job of estimating the probability of default over one- and three-year horizons than just the standard ratings, which are less prone to change (Hamilton and Cantor [2004]).

Exhibit 3 summarizes the impact of the macro cycle on annual corporate default rates for each subinvestment-grade credit rating. It presents average 12-month corporate issuer-weighted default rates under 3 economic scenarios defined by the relationship of the growth rate of the U.S. economy to its historical trend: "above trend growth," "trend growth," "below trend growth."[5] As expected, annual default rates tend to rise as ratings and the economy deteriorate. At the same time, for any given credit rating, default rates also are negatively correlated with economic growth, rising in recessionary periods and falling during expansions.

Note that average default rates in the "trend growth" scenario are very similar to "above trend growth" default rates. This could be because above-trend expansions tend to be inflationary. Inflationary expansions provoke monetary tightening, which raises financing costs, thus potentially negating the effect of incremental revenue. Alternatively, defaults in "trend growth" and "above trend growth" scenarios may occur primarily for idiosyncratic reasons (e.g., wrong business model, obsolete technology) that are inelastic to the macro outlook.

In contrast, default rates in the "below trend growth" scenario are about twice as high as in the other two scenarios. For example, B3-rated bonds default at an almost 10% average annual rate when the economy is growing at or above trend. However, the average annual rate of default doubles to almost 20% in periods of sub-par growth.

In other words, in a recession, a B3 bond is likely to have a downward-sloping term structure of default for the next few years, whereas the term structure of default of the same bond currently in a period of economic expansion is likely to be upward sloping. As we argued previously, even though both bonds have the same long-term cumulative probability of default, their very different term structures of default are likely to result in large valuation differences, with the bond starting out in a recession trading at much wider spread levels.

CYCLICALITY OF SOVEREIGN DEFAULT RATES

The relatively small sample of sovereign defaults makes it impossible to produce a similar table for emerging markets debt, one that would have average historical sovereign default rates for each ratings category meaningfully grouped by each alternative economic scenario. There have been only 9 defaults by rated countries since the inception of the EM bond market about 10 years ago, and this includes even the recent "market-friendly" (i.e., implying a low level of loss in net present value terms) exchange offers by the Dominican Republic and Uruguay.[6]

However, as in the corporate universe, sovereign defaults occur more frequently in times of economic distress, when tax revenues and export receipts plunge. In fact, the relationship between sovereign defaults and economic growth is characterized by a very high degree of causal endogeneity. When a sovereign default occurs, it is usually not only an effect but also a cause of sub-par growth (at least in the immediate aftermath). Witness, for example, the quarterly real GDP growth patterns of Russia and Argentina, the two biggest EM defaulters in the past 10 years (*Exhibit 4*). Russia defaulted in August 1998, while Argentina defaulted in November 2001. In both cases, real GDP

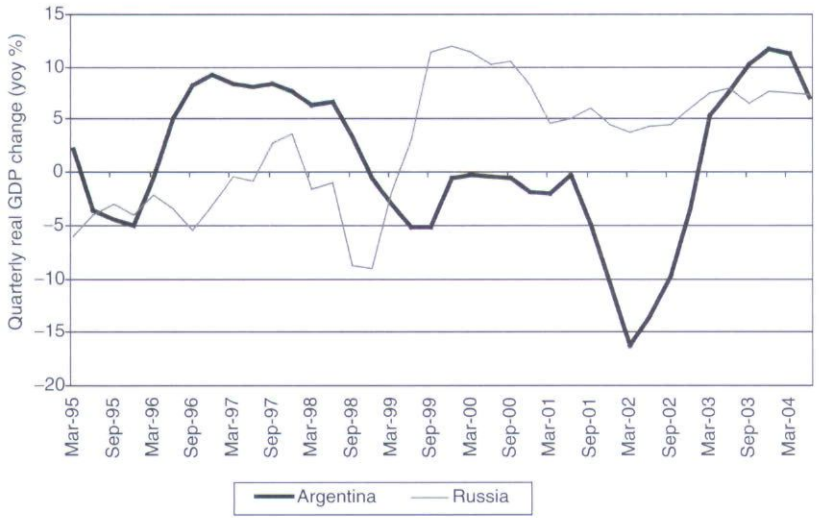
EXHIBIT 3

Average 12-Month Corporate Default Rates (January 1986–October 2004) for 3 Different Economic Scenarios (%)

	Above trend growth	Trend growth	Below trend growth
Ba1	0.5	0.2	0.9
Ba2	0.1	0.2	0.7
Ba3	0.5	0.4	1.1
B1	1.2	1.5	2.1
B2	1.0	2.1	5.5
B3	9.6	9.7	19.8
Caa-C	30.3	31.3	64.7

Source: Moody's, Federal Reserve Bank of Chicago.

EXHIBIT 4
Real GDP Growth of Argentina and Russia



Source: Bloomberg.

growth was negative prior to default, thus aggravating debt dynamics, but growth then plunged even more deeply as the defaults led eventually to the collapse of domestic financial systems.

SYNCHRONICITY OF THE EM AND HY CYCLES

If default rates in EM and HY are closely linked to their respective macro cycles, then the question becomes how synchronous these two cycles are. In other words, how is an aggregation of individual EM cycles related to the pace of economic growth in the United States? To answer this question, we need first to decide how to define the EM universe and how to weight separate country cycles in order to aggregate them into a single series.

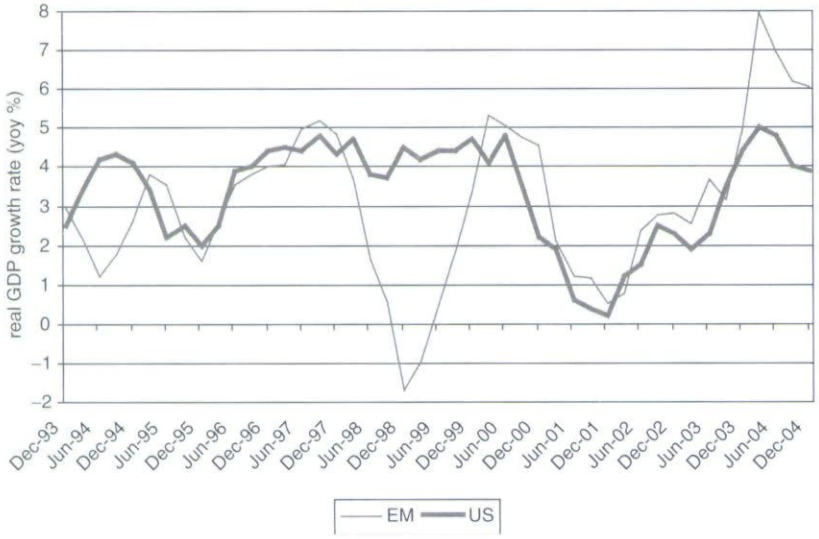
EM debt portfolios are generally managed against one of the following three index benchmarks created and maintained by JP Morgan: the EMBI+, the EMBI Global (EMBIG), and the EMBI Global Diversified (EMBIGD). Of the three indices, the EMBIGD is the broadest and most diversified benchmark.[7] Not surprisingly, investor surveys conducted by JP Morgan indicate that by late 2004 more than half of EM debt assets managed against the three indices were already benchmarked against the newer EMBIGD. Whereas the EMBI+ and the EMBIG are dominated by Latin America at the expense of Asia and, to a lesser extent, of eastern Europe/Middle East/Africa, the EMBIGD provides a broader, more balanced regional distribution: Latin America (49.2%), eastern Europe/Middle East/Africa (34.2%), and Asia(16.6%).[8] It is, therefore, reasonable to define the EM universe as comprising the 31 countries that are part of the EMBIGD.

Although there are several ways of assigning weights to individual country growth series, it makes sense, for our purposes, to use current (as of April 2005) weights or market caps of individual countries in the EMBIGD. These are the weights that investors buying the EMBIGD index fund today would use if they wanted to know what kind of aggregate historical growth rate the countries comprising the index have delivered.

Exhibit 5 shows the relationship between the current market-cap-weighted average of quarterly real GDP growth rates of the 31 EMBIGD countries and the real GDP growth of the United States since December 1993.[9] There were many long periods when the U.S. and EM growth cycles were synchronous, as well as some periods of pronounced asynchronicity. The two cycles have moved together for more than 6 out of 11 years under consideration: September 1995–December 1997, December 1999–December 2003. Nevertheless, the aggregate EM cycle has been more volatile than that of the United States. The largest deviation came at the end of 1998 on the heels of the Asian and Russian crises, when EM growth rates plunged into negative territory, whereas the rate of U.S. real GDP growth remained a robust 4%. Another, shorter, period of EM growth underperformance occurred in 1994, as Turkey's output severely contracted in the wake of a local financial crisis. At that time the Russian and Ukrainian economies were also continuing with their steep declines following the collapse of the Soviet Union.

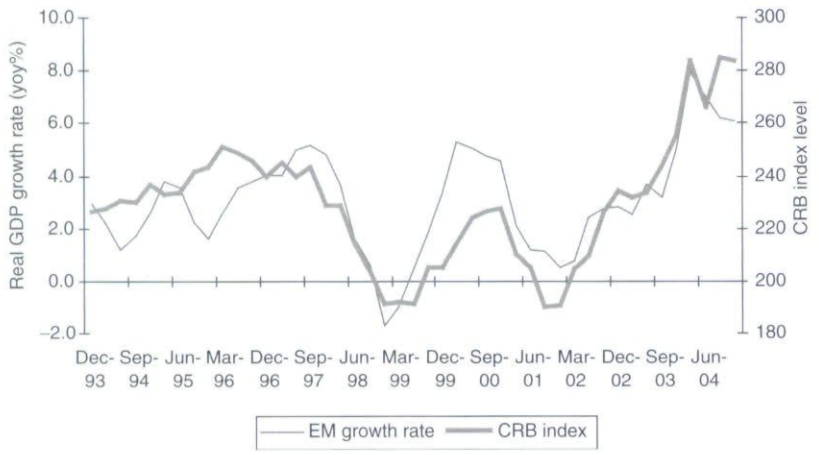
However, not all periods of asynchronicity resulted from the underperformance of the EM cycle. In the past couple of years, the EM aggregate has noticeably outperformed the U.S. cycle. The structural reforms of the 1990s, combined with more competitive currencies following the abandonment of fixed exchange rate regimes, have made a positive contribution to the growth rate of many EM economies. Yet higher commodity prices appear to have been an even more important driver of the EM growth spurt. The increasing demand from China, an

EXHIBIT 5
EM and U.S. Growth Cycles



Source: Bloomberg, Institute of International Finance, various central banks, JP Morgan.

EXHIBIT 6
EM Growth Cycle and Reuters CRB Index



Source: Bloomberg.

EM itself, is one of the main reasons for the recent upswing in the prices of raw materials such as industrial metals and oil. The value of commodity imports by China has climbed by $70 billion or 156% in the past 3 years (Hale [2005]).

Rising commodity prices generally, though not universally, mean better terms of trade for EM economies, where in contrast to their negative effect on the growth rates of the United States and other major developed economies, higher commodity prices boost export receipts, fiscal revenues, and foreign investment. There is a close correlation between the EM cycle and fluctuations in the Reuters Commodity Research Bureau (CRB) futures price index, which tracks 17 different commodities (*see Exhibit 6*). In and of themselves, fluctuations of the CRB index explain 60% of variation in the aggregate EM real GDP growth (Rsq adj. = 0.6). In particular, in addition to accounting for the most recent outperformance of the EM cycle, the CRB sheds some light on the Russian debacle and low EM growth rates in 1998–99, and again in 2001, when the index dipped to its lows.

Thus, although there are times when the EM and HY cycles move side by side, there are other times when they diverge. In other words, the assumption of synchronicity cannot be taken for granted. Changing terms of trade as well as multiple endogenous factors can lead to significant deviations in both directions.

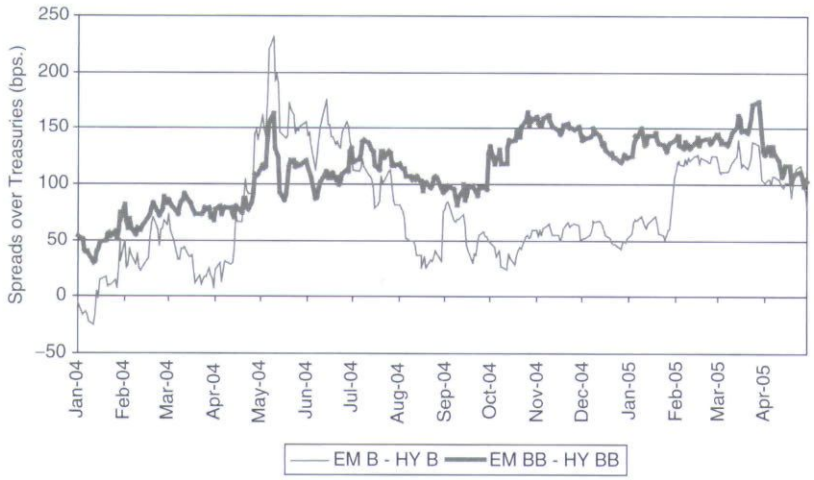
RELATIVE VALUE

The recent outperformance of the EM macro cycle makes the persistence of fairly large positive spread differentials between similarly rated EM and HY bonds quite puzzling (*see Exhibit 7*). For example, as of the end of April 2005, the spreads of BB-rated EM sovereigns were more than 100 bp wider than those of similarly rated corporate issues. To put it differently, the compensation for credit risk (and potentially other factors) demanded of BB-rated EM sovereigns was more than a third higher than that of their HY counterparts.[10]

If anything, the outperformance of the EM cycle should have resulted in negative spread differentials, with EM bonds trading at tighter spreads than similarly rated HY bonds. Unless investors are expecting an imminent

EXHIBIT 7

Spread Differentials (EM minus HY) for BB- and B-rated Bonds



Source: JP Morgan.

downturn in commodity and energy prices in an environment in which the U.S. economy continues to hold up, EM sovereign debt appears to be much more attractively priced than HY.

What, then, explains the consistently higher risk premium assigned to EM bonds? The most likely answer is that investors are simply less familiar with EM economies. The lack of familiarity, in turn, makes sovereign bonds appear more risky. As EM debt matures as an asset class and develops a longer trading and credit history, this relative lack of knowledge should be gradually rectified.

An important development likely to make investments in EM debt more mainstream and to help eliminate a "home bias" in favor of domestic HY bonds has been a dramatic improvement in the dissemination of sovereign economic and financial data. In 1996, the International Monetary Fund established the Special Data Dissemination Standard (SDDS). The SDDS covers 18 data categories and prescribes the frequency and timeliness with which data for these categories are to be disseminated, in addition to assisting users in monitoring their integrity and quality.[11] In most cases, the country data provided under the SDDS are much more timely than quarterly earnings reports published by corporations.[12] By 2005, 22 out of 31 countries included in the EMBIGD (and comprising more than 80% of its market cap) had met the specifications of the SDDS. The increased transparency should help to drive down the EM debt risk premium.

In sum, even adjusting for credit ratings, annual default rates of risky bonds fluctuate. These fluctuations, driven by macroeconomic cycles, affect bond valuations. As the EM and HY macro cycles are not necessarily synchronous, the argument that similarly rated sovereign and corporate bonds should trade at similar spreads does not always hold. When the EM and HY macro cycles diverge, EM and HY bonds with the same credit ratings can trade at very different spread levels and still be fairly valued relative to each other. Alternatively, they can trade at similar spreads but represent vastly different values.

Speculative-grade sovereign bonds have been persistently trading at wider spreads than similarly rated corporate issuers. Given the recent outperformance of the EM macro cycle, incorporating the cyclical perspective into a ratings-based relative value framework accentuates even more the undervaluation of the EM debt. One way or another, the relative undervaluation of EM bonds is likely to disappear eventually. Anticipating future drivers (e.g., shifts in terms of trade) of the divergence or convergence between the EM and HY macro cycles will prove critical to determining intermarket relative value.

ENDNOTES

The author thanks Jeffrey Kaufman, James Lukens, and Michael Atkin for their insightful comments.

[1]The swings in spreads are further amplified by varying recovery rates, which have historically been negatively correlated with default rates.

[2]This logic does not generally apply to countries. Sovereigns tend to be serial issuers with many bonds outstanding. As a result, for a typical sovereign, a single bond issue does not provide as much cash flow relief as it does for an average HY corporation.

[3]The biggest advantage of the CFNAI is its monthly frequency. The index—the first principal component of 85 monthly indicators on national economic activity—is constructed to have an average value of zero and a standard deviation of one. Since economic activity tends toward trend growth rate over time, an index reading of zero corresponds to an economy growing at trend. Background information on the CFNAI is available on the Federal Reserve Bank of Chicago's Web site at www.chicagofed.org.

[4]January 1986 is the earliest date for which more or less reliable HY bond index data are available. In other words, the

period under consideration covers the speculative-grade bond market since its inception.

[5]The three scenarios are defined by the 12-month moving average of the CFNAI: CFNAI ≥ 0.2 for "above trend growth," $-0.2 <$ CFNAI < 0.2 for "trend growth," CFNAI ≤ -0.2 for "below trend growth."

[6]Dominican Republic (April 2005), Uruguay (May 2003), Argentina (November 2001), Moldova (June 2001), Ivory Coast (March 2000), Ukraine (January 2000), Ecuador (August 1999), Pakistan (November 1998), Russia (August 1998).

[7]Although the EMBIG and the EMBIGD include the same countries, the EMBIGD enjoys a greater degree of diversification as it constrains the weight of large issuers in the index.

[8]As of April 22, 2005.

[9]Pre-1993 comparisons are hindered by the poor quality of data in several countries as well as by the radically different economic environments. The early 1990s saw watershed events in many different emerging markets: dismantling of communist economies in eastern Europe, adoption of NAFTA in Mexico, structural economic reforms in China. December 1993 is also the earliest period for which reliable EM debt trading data are available.

[10]One could argue, of course, that the ratings are simply wrong. Although the correctness of individual country or corporate ratings may be a matter of legitimate debate, it can be reasonably assumed that the ratings agencies are generally right most of the time and that even when they are wrong, their errors are normally distributed. Consequently, we can feel more secure about drawing conclusions from the average spread data of credit tiers than from individual bonds. To be fair, however, it should be pointed out that credit tiers in EM indices are still relatively more concentrated. Good analysts could always assign their own country ratings and draw appropriate conclusions.

[11]More information on the SDDS is available on the IMF's Web site at www.imf.org.

[12]Moreover, the SDDS data are arguably even more transparent than heavily manipulated corporate releases. But that is a topic for another study.

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