In speeches given during June 2007, Federal Reserve chairman Ben Bernanke and Federal Reserve governor Kevin Warsh said that the current price of risk seen in the marketplace appears to be low in relation to historic levels. “Should the benign environment be interrupted by a geopolitical event or some other developments, the price of risk would rise,” Bernanke predicted. What’s more, Warsh cautioned that markets have yet to face a “sufficiently stringent stress test.”

This article argues that the “price of risk,” as reflected in standardized measures of credit risk such as the CreditGrades model, is at an unrealistically low level based on historic standards and that a fairly abrupt correction to a higher and more sustainable level of credit risk pricing may occur as the result of a sudden or unforeseen geopolitical or market event.

Though they may be “catastrophic” in human and financial terms, abrupt corrections in the marketplace are not chaotic events. During periods of rapid market correction, or busts, there is perfect agreement on future market direction among most market participants. Chaos is more correctly attributed to what is considered to be a normal, “orderly” marketplace in which there is generalized disagreement on the future direction of market prices. Sudden busts reflect the final collapse of fragile market support systems and are sometimes identifiable by...
Breaking Down the CreditGrades Model

The CreditGrades system was established in 2002 — by JPMorgan, Deutsche Bank and Goldman Sachs (“the endorsers”) — as a model for the calculation of credit risk in the financial industry. The stated goal of the endorsers was to create an open, transparent standard for measuring quantitative credit risk.

According to their “technical document,” logical applications of this model include “price discovery for illiquid firms, monitoring across a large array of firms, and the investigation of relative value opportunities across the credit and equity markets.”

CreditGrades relies on the liquidity of the equity markets to provide early warning signs of credit risk. The technical document states that use of equity market volatility as the best gauge for future changes in credit quality is “based on the work of Black and Scholes (1973) and Merton (1974), who observed that both equity and debt can be viewed as options on the value of a firm’s assets, implying that equity option pricing techniques can be adapted for use in assessing credit.”

Over the last five years, the CreditGrades metric has steadily fallen when applied to a widely divergent group of industries. The reduction in an industry’s “credit grade,” which is stated in terms of basis points charged over the risk-free interest rate, implies that (1) the credit quality of all these industries has steadily improved and (2) their associated probabilities of default have steadily declined.

In this case, a picture is worth a thousand words, so please see below a reproduction of industry-wide “CreditGrades” (measured as of June 13, 2007) for companies in the following industries: energy, utilities, industrial, technology and communications.

CreditGrades: Historical Charts by Industry Sector

Figure 1: Historical Chart of Credit Risk in the Energy Sector

Figure 2: Historical Chart of Credit Risk in the Utilities Sector

Figure 3: Historical Chart of Credit Risk in the Industrials Sector

Figure 4: Historical Chart of Credit Risk in the Technology Sector

Figure 5: Historical Chart of Credit Risk in the Communications Sector
What Do these Charts Suggest?

Even a casual review of these charts should give all risk officers, credit managers and financial analysts pause. When was the last time you saw such universal agreement on any substantial financial question in the marketplace? Based on these charts, there is almost no measurable credit risk in any of the major industries; moreover, there is almost no probability of default, and there should logically be no “cost” adder for credit.

Though I hesitate to make this statement, these charts have the appearance of a classic financial boom (though in an “upside down” form of presentation). In other words, the credit risk that is apparent in the marketplace, as measured by the CreditGrades model, has declined as far as it can go in the downward direction, and credit risk cannot decline below zero.

Consequently, there is only one direction that credit risk can go in the future — and that is up. The real question then is not whether it will go up, which I take to be a given, but rather how quickly it will go up.

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Unfortunately, for students of financial history, markets that exhibit long-term boom tendencies tend to correct with busts (which are short-term, large-scale corrections in the opposite direction). While booms and busts have long been studied and analyzed with respect to equity markets, there has been little analysis of this same phenomenon with respect to credit risk.

There have been, however, several previous attempts to explain the longevity of the current credit boom illuminated by the CreditGrades charts. One argument that I believe helps explain the recent credit phenomenon is the “sandpile” theory of complex systems, originally developed by the late Professor Per Bak and his colleagues at the Brookhaven National Laboratory in their landmark 1987 paper on self-organized criticality.1

“In order to visualize a physical system expected to exhibit self-organized criticality, consider a pile of sand. If the slope is too large, the pile is far from equilibrium, and the pile will collapse until the average slope reaches a critical value where the system is barely stable,” the paper read.

Critical Instants and Precursory Signals

Aside from the CreditGrades system, there are few other models and tools that market participants can use to predict booms and busts in credit risk. Moreover, the "log-periodic power law" model — a popular model that has been applied in the recent past to project market crashes in the equity markets — is flawed and has not been particularly accurate in predicting market busts.

However, in an article titled “A Complex System View of Why Stock Markets Crash,” Professor Didier Sornette of the University of California, Los Angeles, notes that “critical instants” in many fields are now being studied for evidence of precursory signals; these signals are expected to improve our capability of predicting large-scale, catastrophic events. (As mentioned earlier, “catastrophic” events are not necessarily chaotic events.)

With respect to stock market crashes, Professor Sornette concludes (in his paper) that “the true origin of a bubble and of its collapse lies in the unsustainable pace of stock market price growth. As a speculative bubble develops, it becomes more and more unstable and susceptible to any disturbance. Large stock market crashes are thus the social analogs of so-called critical points studied in the statistical physics community in relation to magnetism, melting, and other phase transformation of solids, liquids and gas.”

The LPPL model is the methodology that Professor Sornette initially proposed for studying market booms and busts. The limitations that this model presented are described by Professor Sornette himself and have also been demonstrated by recent events (e.g., the ongoing boom in equity markets). Nevertheless, the idea of a “critical instant” is still an intriguing concept with respect to credit markets, and the question is whether other early indicators — such as the CBOE Volatility Index (VIX) — may already be available in the marketplace to signal the approach of an impending credit bust. This brings us to the primary question presented by this article.
Is Credit Risk Approaching a Critical Instant?
Based on the CreditGrades graphs, it appears likely to this author that we are approaching the end of a long-term boom cycle in credit risk. That is, the cost or price of credit risk has declined as far as it can logically go across a broad cross-section of industries and companies.

Recently, in comments concerning the extraordinary growth of the credit derivatives (CDS) market, Federal Reserve Bank of New York president Timothy F. Geithner said: “We’ve seen substantial change in the financial system, with the emergence of a very large universe of leveraged private funds, rapid growth in exposures to more complicated and less liquid financial instruments, all during a period of very low volatility. This means we know less about market dynamics in conditions of stress. … The fact that the banks are stronger and risk is spread more broadly should make the system more stable. We can’t know that with certainty though. We’ll have a test of that when things next threaten to fall apart.”

As a possible precursory signal of when things will “next threaten to fall apart” in the credit market, the VIX may be worth watching. The VIX provides a snapshot of expected stock market volatility over the next 30 calendar days, and it calculates market volatility from stock index option prices on the S&P 500 index (one of the primary US stock market benchmarks).

The VIX touched historically low values during both the fourth quarter of 2006 and the first quarter of 2007 (levels not seen since the fourth quarter of 1993 and first quarter of 1994). Any sudden increase in the VIX index, reflecting greater volatility in the equity markets, could be an early warning signal of a return to higher probabilities of corporate default and a resulting increase in the cost of credit.

During the second quarter of 2007, the VIX climbed from a near all-time low of “10” reached during January 2007 to a recent close of “18” on July 23, 2007. Recent high values occurred during September 2002, when the VIX approached the “40” level.

“The current relatively low cost associated with credit risk must inevitably come to an end, and failure to prepare for that eventuality would be imprudent at best.”

All of the data and trends that have been analyzed in this article suggest that the prudent risk officer, credit manager and financial analyst should prepare for a significant increase in the real cost associated with credit risk. Whether a future increase in the cost of credit occurs abruptly (which seems quite possible) or, preferably for society, over an extended period of time is still to be determined.

However, we do know that the current relatively low cost associated with credit risk must inevitably come to an end, and failure to prepare for that eventuality would be imprudent at best.

FOOTNOTES
3. The following is a detailed description of the CreditGrades model: “The purpose of the CreditGrades™ model is to establish a robust but simple framework linking the credit and equity markets. The relationship between corporate debt and equity was first formally proposed by Black and Scholes (1973) and Merton (1974). These authors observed that equity may be modeled as an option on a firm’s assets, and that the value of a firm’s debt is simply the value of its assets in excess of the equity value. The approach was further developed by Black and Cox (1976) and later by Leland (1994). According to their approach (which we will refer to as the structural model), an event of default occurs when the asset value of a firm crosses a predetermined default barrier or threshold. We use the structural model framework to develop a link between credit and equity derivatives.”

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