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### Financial Engineering News Special Report

# Is Credit Dead?



By Aaron Brown

Credit has always had critics. The Bible prohibits interest and seizure of collateral and requires periodic forgiveness of debt. The influential medieval legal philosopher Maimonides said lenders profit from the success of a business venture without sharing in the losses.

On the Frontiers  
of Financial Engineering  
and Risk Management



There is a contrast here with equity. Someone who loses money in equity investments is pitied, but a lender who is not repaid is a hated repo man, like a stereotypical silent-movie villain throwing a widow and her children into the snow.

The same kind of contrast appears in the corporate world. When hundreds of debt-free Internet companies went bankrupt in 2000, foolish optimism was blamed. When a dozen highly leveraged telecommunication and energy trading companies went under in 2002, a major scandal ensued, sending former billionaires to prison and rewriting the law and practice of finance.

While equity documents can be simple, bond indentures run into hundreds of pages. Companies financed with equity have complete flexibility, but borrowing money saddles a company with restrictive covenants and the need to come up with specific amounts of cash at specific times. When a company fails, shareholders sometimes sue. Creditors always require legal adjudication, even when they agree among themselves. In short, credit has costs. The legal bills incurred in a bankruptcy often destroy 20 percent or more of enterprise value.

Today, most people consider lending money to be ethical, but they perceive high-risk lending to be tainted. If the borrower repays the loan, the high interest rate is exploitative overcharging. If the borrower doesn't repay the loan, the lender has conspired in the borrower's ruin. If credit is not granted, the lender discriminates against the unfortunate. The only way to avoid criticism is to stay out of the high-risk lending business altogether. Credit is okay, but credit risk is still viewed with suspicion.

The distinction is embedded in the language. "Equity" is rooted in fairness, while "debt" and "liability" are

negative words. "Default" and "bankrupt" are even worse. And, the worst thing equity can do is "underperform."

In the last ten years, financial engineers have joined the attack on credit risk. New instruments, models and regulations reduce the distinction between credit risk and market risk. It's now possible to imagine a near future in which all assets are marked to market, all credit risk is hedged with derivatives written by diversified equity investors (insurers have been keen participants in the default swap markets), and all financial risk is market risk.

Here are five traditional distinctions, along with reasons a financial engineer might use to argue against them today:

**Market risk is losses from movements in prices of liquid securities; credit risk is losses from default:**

Today, credit risk incorporates more than default risk. Events like distress sales, downratings and restructurings are included in credit; recoveries are subtracted from losses. This definition of credit risk correlates quite well with movements in the price of liquid securities such as bonds and credit derivatives -- even with equities.

**Market risk is continuous; credit risk is characterized by sudden losses:** Market models have been incorporating jumps for 20 years now. Credit risk models have moved to probability of default evolution and credit transition models that are continuous or near-continuous. Missed payments or bankruptcy filings do not necessarily cause large jumps in these parameters.

**Market risk is evaluated instantaneously; credit risk must be averaged over a complete economic cycle to get a meaningful measurement:** As credit markets have become more sophisticated, the spot price of credit has become the best estimator of credit risk over any future period.

**Hedging and diversification are the primary tools for managing market risk:** For credit risk, hedging instruments are unavailable and diversification is ineffective because defaults are highly correlated in time. Credit risk is managed by limiting individual exposures and by setting contractual terms. We now have liquid hedging instruments (credit derivatives) and dynamic hedging strategies. These typically result in less risk and, therefore, lower capital charges at less cost than traditional credit risk management strategies.

**Market risk is evaluated through financial theory and historical statistics; credit analysis is an expert judgment:** Improved financial theory and credit scoring appear to outperform expert judgment. In any case, quantitative methods can be validated and backtested more easily, are cheaper to implement, and are more consistent.

While I agree at least in part with all five points, I'm not willing to predict that financial engineers will do in 10 years what moralists couldn't do in 4,000. Credit has survived because it is a business relationship and not just a financial transaction.

Suppliers are traditionally willing to wait for payment until their customers are paid. This creates an implicit partnership -- a guarantee on both sides of quality and good faith. Similarly, it creates a monitoring incentive for suppliers and customers -- the entities in the best position to judge business performance. If there is a break in the production chain, either physical or financial, the loss is shared by all participants.

Investor-supplied credit serves a similar function. Debt imposes a discipline on management, which increases the total value of the firm despite the increased expected value of legal costs due to bankruptcy. Bank-supplied credit has always meant more than just money; a company needs bank references to do business. In fact, in this instance the use of credit is increasing. Traditional investment banks did not have significant amounts of financial capital -- they lent only reputational capital to the companies they underwrote and advised. Today they are much more likely to have money lent as well -- this strengthens the relationship.

Governments are also unlikely to give up borrowing. They cannot sell equity, and a liquid government debt market is good for the financial system. More importantly, public debt held internally strengthens the relationship of a government with its citizens, and public debt held externally strengthens the relationship with other countries.

Financial engineers will continue to attack credit risk. Unmonitored and badly managed credit risk creates costs but not relationships. This kind of credit risk should be converted to market risk so that it can be monitored and managed better. Some businesses appear profitable only because they sell underpriced credit risk. With proper measurement, these businesses can be eliminated. But credit risk itself will survive, not in spite of its disadvantages, but because of them. The high cost of default is the cement of business partnerships.

*Aaron Brown is a vice president for credit risk architecture with Morgan Stanley, the US investment bank.*

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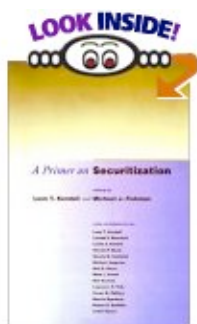
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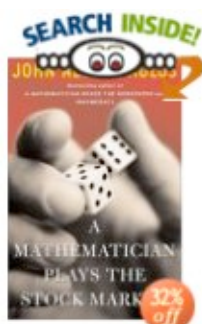
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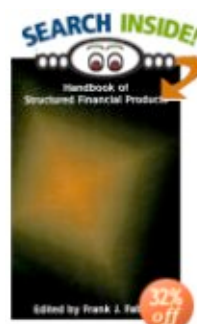
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