

Research Digest

The September issue of *The Region* includes two digests, the first of recent research by Minneapolis Fed consultant Andrew Atkeson and his UCLA colleagues on the link between insolvency crises and economic recession. To understand that relationship, they develop a new method for measuring financial soundness of firms. The second digest looks at research by Minneapolis Fed economists Jonathan Heathcote and Fabrizio Perri on the efficiency with which resources are allocated globally. They find a complex, subtle relationship between economic growth and international efficiency.



Andrew Atkeson

Insolvency and recession: What's the connection?

A robust measure of financial soundness sheds light on the link between insolvency crises and recessions

It has been an article of faith that the Great Recession was intensified by the collapse or near-collapse of major U.S. firms, particularly those in the financial sector. Indeed, many economists consider corporate instability and insolvency to have played a major role in virtually all recessions. But at this point, the nature of this linkage and its actual significance are still poorly understood. Minneapolis Fed consultant Andrew Atkeson of the University of California, Los Angeles, along with his UCLA colleagues Andrea Eisfeldt and Pierre-Olivier Weill, explore the relationship in depth and over time in a recent staff report (SR 484, online at minneapolisfed.org), “Measuring the Financial Soundness of U.S. Firms, 1926-2012.”

The association between recession and insolvency is thought to stem from financial frictions. When firms are financially healthy, the financial system can do its job of facilitating the constant reallocation of productive resources from shrinking to growing firms and from saving households to investing firms that is necessary to ensure that these resources are being used efficiently.

In contrast, if a large number of firms become financially unsound, or appear to be close to

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insolvency, then it becomes much more difficult for the financial system to do its job, and productive resources don't get to the firms that can make best use of them. The lack of trust and uncertainty that arise when many firms are close to insolvency impede capital flows generally and thereby amplify business cycle fluctuations.

"A contribution to measurement"

Atkeson, Eisfeldt and Weill explore this idea by first developing a measure of financial soundness valid for a broad spectrum of firms over a long period. They call their measure "distance to insolvency." Simply put, it gauges how close a given company is to being unable to pay its bills. They define DI as the "ratio of our measure of leverage to our measure of asset volatility."¹

In essence, DI measures how much equity a company has to fall back on compared to its general risk profile. A comparable calculation for occupations would measure literally how thick a cushion a worker has relative to the risk of falling. Trapeze artists are more likely to fall than accountants; their cushion depth relative to their job risk provides a fair measure of whether or not they'll survive a slip.

The economists offer a theoretical foundation for their measure using an established model of

structural credit risk. On that basis, they approximate firm DI empirically as the mathematical inverse of the volatility of each firm's equity. So a company whose stock value fluctuates widely will have a low (or short) DI; whereas, a company with more stable stock value will have a higher DI (a greater distance to insolvency).

They then validate it empirically through comparison with alternative measures of financial soundness, including credit ratings, option-based bond spreads, credit default swap rates and others. They find that their measure correlates closely with these others, "both in the cross section at a point in time and across time." In other words, DI is a reasonable measure of financial health, with results similar to other such measures.

Why then develop another gauge? "The primary advantage of our measure of DI, relative to leading alternatives," they suggest, "is that it requires only data on firms' equity volatility and hence can be computed for a very broad set of firms over a very long historical time period." While other measures rely on data collected only in recent years, or from just a few sectors of the economy, statistics on equity volatility have been gathered from many companies for many years—just what's needed for long-term assessment of U.S. corporate financial stability.

The economists say their paper is intended as a "contribution to measurement," and it is indeed that. But it goes well beyond constructing a new and widely applicable measure of financial health through a rigorous examination of several crucial questions: What is the relationship between financial soundness and recession? Which components of soundness are most important in explaining insolvency crises? Do financial and nonfinancial firms differ in terms of soundness? Can financially unhealthy firms be easily identified in advance of crisis?

Soundness and recession

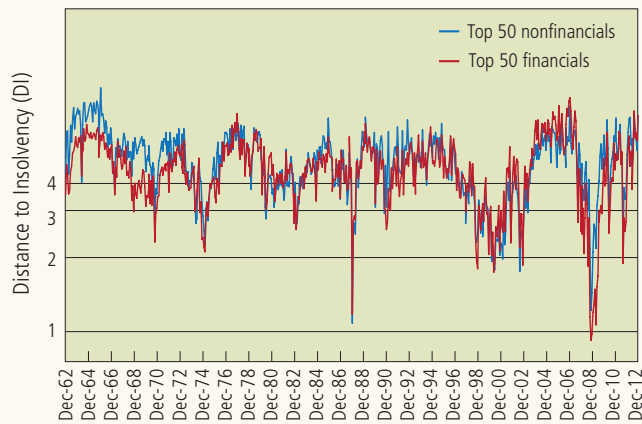
Are U.S. recessions correlated with insolvency crises? This is perhaps the economists' central question, and they use their measure of DI to address it. The answer: yes and no. The largest recessions in recent U.S. history, in 1932-33, 1937 and 2008, are closely associated with crises in insolvency, but there is no systematic relationship between insolvency and other U.S. recessions between 1926 and now. Thus it appears that financial frictions did play a major role in the largest modern American recessions, but not in smaller recessions.

How important is leverage?

The economists' measure of DI allows them to distinguish between changes in firm leverage and asset

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Distance to insolvency for large U.S. firms, 1962-2012



Note: This figure compares the log median distance to insolvency (DI) for the largest 50 financial and nonfinancial firms in the United States, as measured by market capitalization. Horizontal lines indicate authors' benchmark DI cutoffs on a log scale.

Source: Figure 21 in "Measuring the Financial Soundness of U.S. Firms, 1926-2012."

valuation, and thereby determine each component's relationship to insolvency crises. They find that empirically, leverage ("a drop in the equity cushion," as they define it) has played far less a role than generally assumed. Instead, changes in firm asset volatility ("an increase in business risk") seem to be the major driver. This is true during the entire period for which they have the necessary data, 1972-2012, but notably in the insolvency crisis of 2008.

Their analysis shows that "this crisis was almost entirely due to an increase in asset volatility. This finding is in contrast to common narratives in the financial press and

academic literature, which emphasize the role of an increase in leverage due to a fall in asset values."

Financial and nonfinancial firms

To their last empirical question—Do financial firms differ in DI ratings from nonfinancial firms?—the economists again find a nonintuitive negative answer. The data indicate little difference. Their comparison of median DI for the 50 largest financial and nonfinancial firms, for example, indicates "virtually identical" trends from 1962 through 2012; see figure above.² "We find that the evolution of the distribution of financial soundness for publicly

traded financial firms closely resembles that of nonfinancial firms," they conclude.

They also address the question of whether efforts to identify weak financial institutions before or during a crisis are likely to bear fruit, as policymakers have hoped—thereby providing a signal for regulators to step in. The economists are skeptical. They look at a set of large, government-backed financial institutions (GBLFIs), including the 18 bank holding companies subject to the Fed's annual stress tests and the eight large financial institutions that failed during the 2008 crisis. The DI data provide no useful warnings: "The risk that any one GBLFI is unsound compared with the others is small relative to the risk that the whole group ... becomes unsound together."

—Douglas Clement

¹ They further clarify that their ratio "corresponds to the drop in asset value that would render the firm insolvent, measured in units of the firm's asset standard deviation."

² Atkeson notes that the actual identity of the 50 largest financial firms may not correspond to the concept of a "bank" that many people hold. The list also changes significantly over time. For the calculation illustrated in the figure, the economists chose their metric because in practice it can be hard to identify in advance of a crisis which financial firms are truly "significant"—a challenge regulators currently face. The authors' method is an objective procedure for doing so.