

The Economic Importance of Being Educated

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PLUS:

Q&A with Laurence Meyer



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Forefront
Federal Reserve Bank of Cleveland
PO Box 6387
Cleveland, OH 44101-1387

forefront@clev.frb.org
clevelandfed.org/forefront

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President and CEO: Sandra Pianalto

Editor-In-Chief: Mark Sniderman,
Executive Vice President and Chief Policy Officer

Managing Editor: Robin Ratliff

Editor: Doug Campbell

Associate Editors: Amy Koehnen, Michele Lachman

Art Director: Michael Galka

Designer: Natalie Bashkin

Web Managers: Stephen Gracey, David Toth

Contributors:

Dan Littman	Anne O'Shaughnessy
April McClellan-Copeland	Andrea Pescatori
Filippo Occhino	Jennifer Ransom

Editorial Board:

Ruth Clevenger, Vice President, Community Development
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Overextended, Underinvested: The Debt Overhang Problem

Doug Campbell
Editor

Too much corporate debt can be a bad thing. This rather obvious intuition is backed up by mounds of research, not to mention ample observations from the recent financial crisis. In the run-up to the meltdown, for example, Wall Street investment banks ratcheted up leverage ratios to \$30 in debt for every \$1 in equity. We all know how that strategy turned out.

Economists have long studied how unwieldy debt levels can kill businesses: Steep interest payments siphon off available cash; highly leveraged firms face higher borrowing costs because of the increased possibility they will default, and so on. If experts can develop accurate predictions of how companies will behave in different over-indebted situations, policymakers might be better able to take appropriate policy actions during financial crises.

More than 30 years ago, economist Stewart Myers wrote the first formal theory of how excessive corporate debt can lead firms to underinvest in projects that otherwise might be profitable. As Myers described it, firms with large debt loads are likely to see their existing debt trade at less than face value. So most proceeds from new investments will flow not to the firm's *owners* but to the firm's *creditors*. An owner's line of reasoning thus becomes distorted: Why bother to pursue costly new projects if most of the future benefits accrue to someone else?

Now, two Federal Reserve economists have taken a potentially important step forward in understanding the debt overhang problem. Filippo Occhino and Andrea Pescatori suggest an even greater role for public spending and perhaps monetary policy to offset the investment aversion that develops among debt-saddled firms.¹

1. Occhino is with the Federal Reserve Bank of Cleveland; Pescatori was formerly with the Federal Reserve Bank of Cleveland, and is now with the International Monetary Fund.

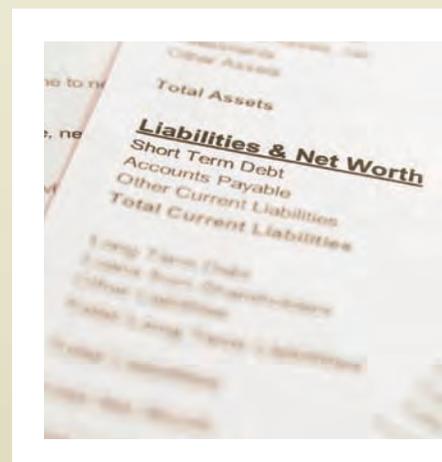
The Case for Debt Relief

The debt overhang distortion sometimes provides a compelling case for at least selective debt forgiveness. When a lender realizes that a firm is very likely to default, it may decide to offer the borrower a break in an effort to recoup more of its loan than it otherwise would in the event of liquidation.

The key is to reduce the distortion enough so that the borrowing firm decides it would benefit by continuing to invest in new projects. As with the example of distortion below, \$1.5 million of the benefit from new investment will go directly to the creditors, and only half a million goes to the firm's equity owners, making it a money-loser.

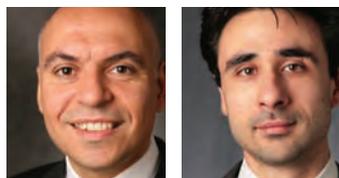
But if the creditor sees this distortion, it may decide to provide some forgiveness on the firm's debt, perhaps decreasing the liability values to \$8 million. In that case, the \$1 million project makes sense for both sides—with the project, the firm gains \$1.5 million. Meanwhile, the debt holders collect \$8 million, whereas they would have received only \$7.5 million in the event of default. This logic is behind much of the debt relief efforts seen on behalf of faltering sovereign nations.

"Without forgiveness, firms may have no hope and give up," Occhino says. "But if part of the debt is forgiven, then you give firms hope, they put in effort, hire, invest, and the value of the firm increases. So both benefit."



The Debt Overhang Distortion

Debt has developed a poor reputation, but it is usually quite useful. It allows firms to take on projects they otherwise couldn't, ultimately adding value to the economy. In fact, debt is a positive feature of developed financial markets. But too much debt—that's another matter.



Filippo Occhino Andrea Pescatori

The financial crisis speaks to the peril of the debt overhang distortion. Through most of the past two decades, the level of

credit market debt in the U.S. economy grew at about the same pace as the level of corporate assets. Then, in the latter part of 2007, debt and assets forked in different directions, with debt continuing to rise but assets nose-diving. The problem wasn't so much that businesses were taking on more debt; it was that their assets were fast becoming worthless. The mortgage securities market was the first to plunge, eventually taking down asset values across the board.

Unleashed were the problematic channels through which high leverage ratios wreak havoc—the overwhelming interest payments, the difficulty in securing new financing, the impulse to save more and spend less, and the irresistible urge of distressed firms to underinvest in the face of crushing debt. This last channel piqued the interest of Occhino and Pescatori.

Because debt and credit affect business investment decisions within their model, the economists can study what happens when the value of a firm's assets abruptly falls, as in the recent financial crisis.

Here is how the debt overhang distortion works: Consider a firm whose asset values plunge from \$10 million to \$7.5 million. The value of its liabilities remains at \$9 million. Along comes an opportunity with a projected cost of \$1 million and projected benefit of \$2 million. The problem is that \$1.5 million of that benefit will go directly to the creditors, and only half a million will go to the firm's equity owners. In other words, it's a money-losing scenario for the equity owners, even if pursuing the project keeps the firm alive. (See "The Case for Debt Relief" above for a possible solution to the problem.)

Limitations of Standard Models

A leading critique of traditional business cycle models—particularly in the wake of the financial crisis—is that they don’t address the financial side of the economy—the flow of funds from investors to firms through banks and markets.

Because the financial side has no relevance, standard macroeconomic models allow firms to accumulate huge sums of debt with no need for policy prescriptions to keep the economy from suffering. That’s because in these models, the frictions caused by excessive debt don’t exist. Instead, the economy automatically adjusts to new equilibriums.

The real economy—employment, output, and so forth—registers no change from frictions when financial variables like debt and equity get out of whack. This failure to replicate the real world obviously limits the utility of such models in helping guide policy.

Efforts to address this shortcoming began during the late 1990s. Federal Reserve Bank of Cleveland economists Chuck Carlstrom and Tim Fuerst were among the first to study how firms with weak balance sheets paid higher borrowing costs and how this “external finance premium” affected the business cycle.

Realistically, the equity holders are performing a simple cost-benefit analysis, and even after weighing the firm’s goodwill, future growth potential, and revenue opportunities, the project still doesn’t add up. The pragmatic decision is to skip or postpone the project and default on the debt. It’s the same motivation that leads homeowners to walk away when their mortgage debt far exceeds the value of their homes. (Although the firm defaults in the example, this is not necessary for the distortion effect to persist. The underinvestment problem happens when there is a *substantial risk* of default, even if default does not necessarily occur.)

A New Way to Look at the Problem

Traditional macroeconomic models are limited by their failure to account for financial frictions (see “Limitations of Standard Models” above). To get a better handle on the size of the distortion, Occhino and Pescatori looked at debt overhang from a new angle.

The innovation in Occhino and Pescatori’s work is to explain how the debt overhang distortion affects interactions between the business cycle and *balance sheet variables*. Because debt and credit affect business investment decisions within their model, the economists can study what happens when the value of a firm’s assets abruptly falls, as in the recent financial crisis. While it is not a be-all-end-all solution to the lack of financial markets in macroeconomic modeling, it is a step toward better establishing the linkages.

Occhino and Pescatori show how a macroeconomic shock to, say, productivity, finds its way onto firms’ balance sheets in the form of damaged asset values. This increases firms’ risk of default, which triggers the debt overhang problem. Now, firms have smaller incentives to invest, knowing that proceeds from investments will go first and foremost to creditors. Decreases in investment further raise the probability of default, creating a vicious circle in which the initial effects of the adverse shock to productivity become both amplified and more persistent over time.

What’s more, crushing debt may persuade firms to pursue far riskier projects than optimal. If the project pays off, then the owners see a benefit; but if it crashes and burns, then the creditors take the biggest hit.

This particular distortion can be devastating. A recent study on the effect of the debt overhang distortion found that every 10 percent increase in leverage decreases the amount firms invest in projects by up to 20 percent. In other words, businesses become zombies—they continue to exist, but no longer expand. This can have a dampening effect on the wider economy.

Policy Implications

The model results square with the general thrust of the data. In the model, as in the real business cycle, credit spreads widen and default rates mount as the economy nosedives. And, as in the data, the model suggests that corporate balance sheets remain impaired for a long time. What's more, crushing debt may persuade firms to pursue far riskier projects than optimal. If the project pays off, then the owners see a benefit; but if it crashes and burns, then the creditors take the biggest hit.

In many macroeconomic models, that would be the end of the story. The efficient response would be to do nothing and simply wait for the market to reallocate resources and find a new equilibrium. But Occhino and Pescatori's model recognizes the impact of financial frictions. This opens the door to policy prescriptions, because investment is dropping more than it should. If this disinvestment becomes contagious, the economic harm could become widespread.

At a macroeconomic level, a straightforward way to address this problem is with expansionary fiscal policy. Increased public spending and decreased tax rates could spur increased production, strengthening firms' balance sheets and at least partly offsetting the debt overhang distortion. A similar approach could be considered with expansionary monetary policy, but Occhino and Pescatori do not explore this option as there is no money, strictly speaking, in their model. That's something for future work.

"In an economic downturn, if you move to expansionary policy you can eliminate this extra decrease caused by debt overhang," Occhino says.

Other reforms are being debated in the aftermath of the financial crisis. Caps on the levels of leverage that firms can carry on their balance sheets might seem like another approach to limiting the debt overhang distortion. Occhino thinks the risk of overstepping here is significant. "For most firms, borrowing is beneficial," he stresses. "What is needed is something to ease the distortion, something to keep firms from avoiding investments during downturns."

The pace of the current economic recovery will depend in no small part on how well policymakers can address the distorting impact of debt, to mop up the mess left behind by the financial crisis. Understanding why overburdened businesses behave the way they do is pretty important, and that is why steps like Occhino and Pescatori's could prove valuable. ■

More on debt overhang



See our dedicated webpage for a short video and links to additional articles on debt overhang.

www.clevelandfed.org/forefront/2010/09/debt_overhang_landing.cfm

Recommended readings



Carlstrom, Charles, and Fuerst, Timothy. 1997. "Agency Costs, Net Worth, and Business Fluctuations: A Computable General Equilibrium Analysis." *American Economic Review* 87(5): 893–910.

Myers, S.C. 1977. "Determinants of Corporate Borrowing." *Journal of Financial Economics* (5): 147–75.

Occhino, Filippo, and Pescatori, Andrea. 2010. "Debt Overhang and Credit Risk in a Business Cycle Model." Federal Reserve Bank of Cleveland Working Paper 10.03.
