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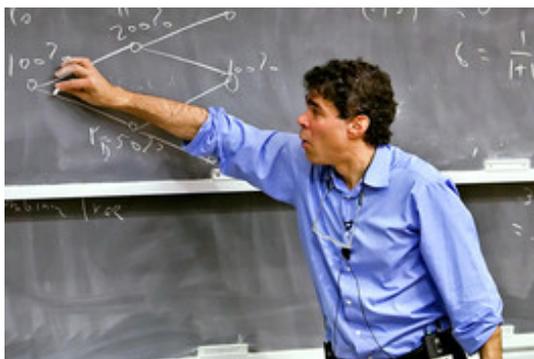
# Crisis Compels Economists To Reach for New Paradigm

By **MARK WHITEHOUSE**

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The pain of the financial crisis has economists striving to understand precisely why it happened and how to prevent a repeat. For that task, John Geanakoplos of Yale University takes inspiration from Shakespeare's "Merchant of Venice."

The play's focus is collateral, with the money lender Shylock demanding a particularly onerous form of recompense if his loan wasn't repaid: a pound of flesh. Mr. Geanakoplos, too, finds danger lurking in the assets that back loans. For him, the risk is that investors who can borrow too freely against those assets drive their prices far too high, setting up a bust that reverberates through the economy.



Yale economist John Geanakoplos has seen his previously obscure theory about collateral's role in the credit bubble gain currency after it burst. *JESSE NEIDER FOR THE WALL STREET JOURNAL*

For years, his effort to understand this process didn't draw much interest. Now it does - yet another aftereffect of the brutal deflating of the credit bubble. The crisis exposed the inadequacy of economists' traditional tool kit, forcing them to revisit questions many had long thought answered, such as how to tame disruptive boom-and-bust cycles.

Mr. Geanakoplos is among a small band of academics offering new thinking about those cycles. A varied group ranging from finance specialists to abstract theorists, they are moving to economic center stage after years on the margins. The goal: Fix the models that encapsulate economists' understanding of the world and serve as policy-making tools at the world's biggest central banks. It is a task that could require a thorough overhaul of the way those models work.

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"We could be looking at a paradigm shift," says Frederic Mishkin, a former Federal Reserve governor now at Columbia University.

That shift could change the way central bankers do their job, possibly leading them to wade more deeply into markets. They could, for example, place greater emphasis on the amount of borrowing in the economy, rather than just the interest rates at which borrowing is done. In boom times, that could lead them to restrict how much money various players, ranging from hedge funds to home buyers, can borrow.

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These guys build a Rube Goldberg machine, then come back to the brilliant decision that maybe common sense is best after all. That deserves a Nobel prize, minimum.

— *Mike Tannenbaum*

Mr. Geanakoplos is emblematic of the new thinking but not necessarily the one whose ideas will prevail. It's too early in the process to know. But he was among a group of academics whom Federal Reserve Chairman Ben Bernanke invited in to discuss the crisis at its peak in October 2008.

The past century saw two revolutions in the way economists view the world. Both

required painful crises to set them in motion, but both arguably improved government's ability to manage the economy.

The first came after the Depression, when economists built some of the first mathematical models that policy makers could use to try to manage the economy. The second came after the inflationary 1970s, when economists created new models that took into account how people's expectations, such as about prices or income, can influence the economy over time.

During the second revolution, the U.S. economy entered a period of stability and low inflation that lasted from the 1980s through most of the 2000s, leading many economists to believe they had triumphed over business cycles. As Robert Lucas of the University of Chicago, one of the intellectual fathers of the models, put it in 2003: The "central problem of depression-prevention has been solved...for many decades."

The result was a new orthodoxy, known as "rational expectations," that still dominates, underpinning everything from the way pension funds invest to how financial analysts put values on securities. Among its main branches is the idea that markets are "efficient," meaning that even an uninformed investor can get a fair shake, because the price of any security tends to reflect all available information relevant to its value.

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See a video of John Geanakoplos and Robert Shiller discussing the crisis.

Mr. Geanakoplos didn't buy it. A former U.S. junior chess champion schooled in math and economic theory at Harvard, he had spent much of his career looking for holes in the dominant theories. His skepticism was seasoned with real-world experience, as head

of fixed-income research at the now-defunct brokerage house Kidder, Peabody & Co. and after 1995 as a partner at a hedge fund that specializes in mortgage-backed securities, Ellington Capital Management.

On Wall Street, Mr. Geanakoplos, now 54 years old, noticed what he saw as a serious market limitation: There weren't enough houses and other forms of collateral to back

all of the large amounts of debt securities that bankers might want to create. So when investors demanded more "asset-backed" securities, bankers had to find ways to "stretch" the available supply of collateral.

One way was to make collateral do double-duty. For instance, mortgage loans the banks made became collateral themselves for complex debt securities, known as collateralized mortgage obligations.



Yale professor John Geanakoplos's 'leverage cycle' theory might help fix central-bank economic models that couldn't handle the financial crisis. *JESSE NEIDER FOR THE WALL STREET JOURNAL*

Another way of stretching collateral was to lend more against it. For example, if a bank lowered the down payment on a \$100,000 house to 5% from 20%, it could have \$95,000 in loans against the house instead of \$80,000. In a similar way, banks could lower the down payments, or "margins," they required of investors who use borrowed money to buy bonds and other securities.

A rereading around 1997 of "The Merchant of Venice," with its talk of a pound of flesh, helped focus Mr. Geanakoplos's thinking about the importance of collateral. "I thought it was a sign from the gods that I was onto something," he says.

Another sign came on a Friday morning in October 1998, following the downfall of the hedge fund Long-Term Capital Management. A lender to the fund where Mr. Geanakoplos was a partner abruptly demanded more margin on a loan. The event, which nearly toppled the fund as the partners scrambled to raise cash by selling securities, drove home to Mr. Geanakoplos how margins could work two ways -- stimulating asset buying as they go lower, but forcing fire sales as they rise.

In a 2000 academic paper, Mr. Geanakoplos offered a theory. He said that when banks set margins very low, lending more against a given amount of collateral, they have a powerful effect on a specific group of investors. These are buyers, whether hedge funds or aspiring homeowners, who for various reasons place a higher value on a given type of collateral. He called them "natural buyers."

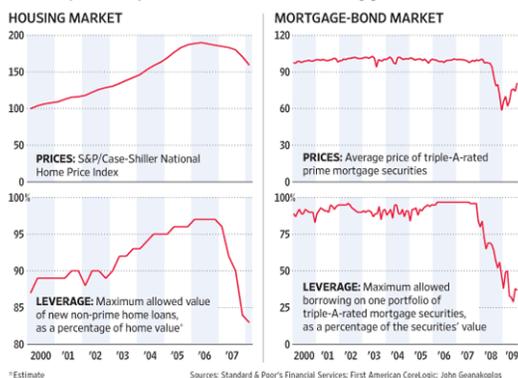
Using large amounts of borrowed money, or leverage, these buyers push up prices to extreme levels. Because those prices are far above what would make sense for investors using less borrowed money, they violate the idea of efficient markets. But if a jolt of bad news makes lenders uncertain about the immediate future, they raise margins, forcing the leveraged optimists to sell. That triggers a downward spiral as falling prices and rising margins reinforce one another. Banks can stifle the economy as they become wary of lending under any circumstances.

"It was evident to me that there was a cycle going on, not just in my little market, but all over the world," says Mr. Geanakoplos, who is still a partner at Ellington Capital. The "leverage cycle," he called it.

This idea had big implications for policy makers. For decades, they thought of interest rates as the most important indicator of supply and demand in credit markets, and the only variable they needed to adjust to achieve a desired economic result. Now, Mr. Geanakoplos was saying that something else -- lenders' collateral or margin demands -- could be even more important.

### The Leverage Cycle

Prices of things like houses and bonds tend to rise when banks make it easy to buy them with borrowed money and fall when banks make it harder—a phenomenon Yale economist John Geanakoplos calls the leverage cycle. These charts show the relationship between leverage—the amount of money investors borrow to buy assets—and prices in the U.S. markets for houses and mortgage bonds.



"I would give him a lot of credit," says Michael Woodford, an economist at Columbia University and a leader in shaping the models currently in use at central banks. "He is someone who was on this issue...very early."

Other, better-known economists -- including Mr. Bernanke, while he was at Princeton -- were also doing work highlighting how finance could affect the broader economy. But none of this work had much impact at

the time. With the business cycle thought tamed, economists were more interested in applying their techniques in other areas, such as education and crime, as epitomized in the book "Freakonomics." Traditional macroeconomics, such as practiced by John Maynard Keynes and Milton Friedman, was relegated to second-class status.

By the middle of this decade, what Mr. Geanakoplos called the leverage cycle was playing out on a grand scale. Motivated by a flood of investment from abroad, U.S. bankers created myriad debt securities backed by assets ranging from credit-card receivables to student loans to corporate bonds. To stretch the available collateral even further, they created hundreds of billions of dollars in ethereal investments known as "synthetic collateralized debt obligations," whose value was tied to that of bonds and asset-backed securities.

From 2000 to mid-2006, lenders lowered average down payments on riskier home loans to less than 4% from about 14%. During this time, the average U.S. home price soared about 90%, and total U.S. credit-market debt rose 68%, to \$43.3 trillion.

Central bankers expressed concern about the debt-fueled boom. But their main forecasting models sounded no alarms, because the models looked only at interest rates, not at any indicator of how much banks were willing to lend on assets. The models "were not able to draw up the red flags," says Tim Besley, a professor at the London School of Economics who served on the Bank of England's policy-making committee until recently.

In 2007, with mortgage defaults rising, banks pulled back on home lending. The average down payment they required for riskier home loans jumped to more than 10% in mid-2007, by Mr. Geanakoplos's calculation. House prices headed lower.

After Lehman Brothers Holdings failed in September 2008, lenders jacked up the margin investors had to put up to buy mortgage securities to nearly 70% from less than 10%, contributing to a wave of selling and losses. Some bankers became reluctant to lend at all.

As the financial system teetered, central bankers' main models offered little insight as to what the impact on the broader economy might be or what they should do to cushion it. It was just good luck, some economists say, that the Fed's chairman had spent much of his career studying what to do in such a situation. "Bernanke had the right model in his head," says Larry Christiano of Northwestern University.

Now that the financial crisis has exposed flaws in the models central banks use, economists have launched into a flurry of activity that is likely to reshape the field. As they did in the two revolutions in economic thought of the past century, economists are rediscovering relevant work. Mr. Woodford asked Mr. Geanakoplos to present his ideas at an April conference held by the National Bureau of Economic Research.

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Mr. Geanakoplos has yet to develop his theory into a comprehensive model. "His work assumes that the leverage cycle is bad, but gives little guidance [about] to what extent regulators should control it," says Markus Brunnermeier, an economist at Princeton who specializes in financial bubbles. (Read a related article.)

The goal for economists now is a model that takes account of what happens in the financial sector, yet is simple enough to apply in policy making. The quest is bringing financial economists -- long viewed by some as a curiosity mostly relevant to Wall Street -- together with macroeconomists. Some believe a viable solution will emerge within a couple of years; others say it could take

decades.

Coming up with the right model could force economists to move away from the ideas of efficient markets and rational expectations on which much of their current work relies. "If that happens, that will be a change of enormous proportions," says Martin Eichenbaum, a professor of economics at Northwestern.

Mr. Geanakoplos is convinced such a paradigm shift is under way. He hopes it will prove beneficial in protecting people from the excesses of the financial markets. To that end, he believes central bankers should collect and publish data on the amount of leverage in the system, and intervene if it gets out of line.

Right now, that would require the Fed to step in where banks fear to go by lending against risky assets such as mortgage bonds, but it would also mean limiting investors' ability to use leverage in exuberant times.

"Our policy seems geared largely toward rescuing banks and bankers," Mr. Geanakoplos says. "If we could manage these cycles better, I think we'd all be better off."

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**ECONOMIST PROFILES**

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In the wake of the worst financial crisis since the Great Depression, economists are racing to provide policy makers with the tools they need to avert a repeat -- a process that some believe could require a revolution in economic thought. In doing so, they are building on the work of colleagues who saw early on the dangers presented by an unstable financial sector. Here are some of the people who did the early work, and who are now using it to build new models of the economy.

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