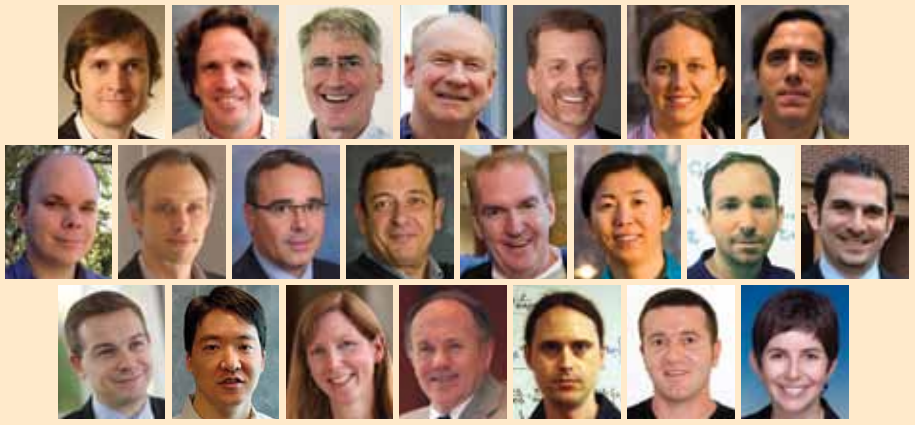
Research Digest



Great Recession

RESEARCH REVIVAL

Just as the Great Depression led to the revitalization of economic theory and empirical methodology, the Great Recession has sparked a renaissance of research. Since the start of the financial crisis in 2007, economists have launched (or redoubled) efforts to understand how such crises lead to recessions, why this recession endured so long, and how policymakers might both revive the economy and prevent a repetition.

At the Minneapolis Fed, economists have pursued several avenues toward the same end. In the first several months of 2014 alone, over a dozen working papers and staff reports were published on related topics. Some of this new work has already been featured in previous *Region* issues through digests, articles or policy papers. While space limitations preclude in-depth reviews of all remaining 2014 research, brief synopses are offered here.

Research Digest

Debt default and European bailout

Several papers have dealt with international dimensions of the crisis and recession. Fed senior research economist Cristina Arellano, with Yan Bai at the University of Rochester, examined international default contagion in sovereign debt markets (SR 491; see June 2014 *Region*) and in a related paper (SR 495) analyzed optimal renegotiation policies for sovereign defaults.

In February, Minneapolis Fed consultant Tim Kehoe, with Stony Brook's Juan Carlos Conesa, published a staff report (SR 497) asking whether the success experienced in the mid-1990s in preventing Mexico's debt crisis from leading to sovereign default through massive bailout assistance could be repeated in the Eurozone.

In short, maybe not.


Cristina Arellano


Yan Bai


Tim Kehoe


Juan Carlos Conesa

Kehoe and Conesa's analysis suggests that a similar bailout by the European Commission, European Central Bank and International Monetary Fund might not succeed. Debt levels are so high among the affected nations (primarily Greece, Ireland, Italy, Portugal and Spain) that they could choose to default on their debt rather than reducing it through loan paybacks as Mexico did by early 1997, thereby regaining access to international credit markets.

A primer on federal funds

The efforts of central banks worldwide to address the financial crisis, deep recession and slow recovery continue to be scrutinized; in that vein, several Minneapolis Fed papers focused on various aspects of monetary theory and practice.

A series of three working papers (WP 708, 710 and 711) released in March and April 2014 by Gara Afonso of the New York Fed and Ricardo Lagos of New York University and the Minneapolis Fed examines the federal funds market through which financial institutions trade their "reserves"—dollar balances that are held at the Fed to meet legal requirements, earn interest or clear transactions.

As Afonso and Lagos observe, this market is important to banks for managing their reserves and offsetting liquidity and payment shocks. It is also the "epicenter of monetary policy implementation," they note, since the Fed uses it—through selling and buying bonds—to influence the amount of liquidity in the national economy. A thorough understanding of this market, therefore, "is of first-order importance to economists interested in monetary theory and policy," they write.

The first of the series is an empirical study of the market's trade dynamics. The second develops a model of the market to answer key questions—what determines the fed funds rate, the rate at which banks borrow and lend to one another overnight? How does this market reallocate funds among banks, and can it achieve efficient reallocations?—and to analyze the effectiveness of central bank policies that use the interest rate paid on reserves to manage the fed funds rate. The third is a "primer" that pulls together major elements of the first two while extending investigation into market structure changes and central bank tools such as open market and discount window operations as well as the interest rate on bank reserves.


Gara Afonso


Ricardo Lagos

Research Digest

Analyzing the "unconventional"


S. Boragan Aruoba

In August, S. Boragan Aruoba of the University of Maryland and the Minneapolis Fed issued a staff report (SR 502) that studies the effects of the Fed's recent "unconventional" monetary policy in which it sought to stimulate the economy by purchasing assets such as mortgage-backed securities, moving beyond the Fed's traditional reliance on the fed funds rate (since the nominal rate was essentially at zero interest per year and could be reduced no further in efforts to boost investment and spending). Such policies were largely untested, and economists expressed "wildly different views" about their impact, notes Aruoba—some confident of success, others predicting ineffectiveness and still others foreseeing that they would trigger damaging inflation.

Aruoba approaches this research by looking at inflation expectations over various time horizons measured in various surveys and combines those with nominal interest rates over the same period, thereby creating a "term structure of real interest rates"—basically a picture of actual interest rates on different maturities, adjusted for inflation, from 1992 to the present. He gauges how this picture responds after the Fed's various policy actions: the initial and second rounds of quantitative easing, the maturity extension program (aka Operation Twist) and the announcement of an explicit inflation target.

Ultimately, Aruoba concludes that the Fed's unconventional policies (along with its ability to sustain zero nominal interest on short-term assets) "kept long-run inflation expectations anchored." They also provided a large level of monetary stimulus, he observes, as indicated by "real interest rates on all horizons … about 3.5% lower than their pre-crisis averages."

So much money, so few loans


Javier Bianchi


Saki Bigio

Another paper that examines the effectiveness of Fed policies was issued in September (SR 503) by Javier Bianchi of the University of Wisconsin and the Minneapolis Fed, and Saki Bigio of Columbia University. Bianchi and Bigio seek to understand why, despite unprecedented policy interventions by central banks, including the Fed, to reduce long-term interest rates and also provide large amounts of liquidity to financial institutions, bank lending seems not to have been stimulated much at all. In the argot of monetary theorists, something has interfered with the "transmission of monetary policy." Banks have plenty of resources to increase loans, thanks to Fed policy, but they seem unwilling to do so.

The economists develop a model to understand how monetary policy operates through a national banking system—two realms that economists have traditionally analyzed separately (monetary economics and financial theory). The model's focus is the liquidity management problem that banks face because they use low-return demand deposits to finance higher-return loans.

The well-known problem is liquidity mismatch: Deposits must be immediately accessible to depositors, but the loans are longer-term assets. Banks hold their reserves at the central bank and use those reserves to settle transfers of deposits with other banks. Therefore, central bank policy actions can alter interbank dynamics by affecting the rates at which banks borrow and lend from one another.

With this mechanism, Bianchi and Bigio analyze how monetary policy steps transmit through the banking system and conclude that while an early interbank market freeze was probably important at the onset of the recession, "a persistent decline in demand [for credit] seems the most plausible explanation" for increased central bank reserves along with decreased lending since 2008.

Research Digest

Credit contractions, not rigid prices

When interest rates hit the "zero lower bound" in late 2008, the Fed used two unconventional tools to get the economy on track. It engaged in large-scale purchases of long-term government-backed assets ("quantitative easing"), seeking to drive down long-term interest rates. It also used "forward guidance," specifying how long and under what conditions the Fed's traditional tool, the federal funds rate, would remain at zero.

Both tools could be justified by the New Keynesian approach to monetary policy, which emphasizes the importance of price rigidities. These rigidities hindered market adjustment, according to New Keynesians, and thus deepened and prolonged the recession. (On the flip side, price rigidities provide a role for monetary policy in the revival of economic health.)

But what if that was the wrong diagnosis? What if prices were actually quite flexible, and the root cause of recession was a credit crunch due to a tightening of collateral constraints? Then optimal policy might be very different.

In a September working paper (WP 714), Francisco Buera and Juan Pablo Nicolini of the Chicago Fed and the Minneapolis Fed, respectively, build a model that has credit and collateral constraints at its heart. This model, *with* flexible prices, replicates many of the recession's key features (such as the collapse in investment and low inflation despite liquidity injected by the Fed's asset purchases), but has very different policy implications than the New Keynesian model. "On the contrary, the model we study stresses a different and novel trade-off between ameliorating the initial recession and delaying the recovery."


Francisco Buera


Juan Pablo Nicolini

Maintaining the economy at the "zero bound" for nominal interest rates—as the Fed sought to do in order to stimulate investment—or avoiding it by targeting a somewhat higher interest rate "implies non-trivial trade-offs," write Buera and Nicolini, in particular, the choice between a less severe recession and a shorter one. These trade-off decisions are even more difficult when policy impacts on various economic actors (workers, entrepreneurs and savers, for example) are taken into account. The economists' "heterogeneous agent" model allows them to analyze those trade-offs as well as those for the aggregate economy.

Sorting out the costs

Several other papers have looked at the impact of the crisis and recession nationally, generationally and on various industry sectors. Ralph Koijen of the London Business School and Motohiro Yogo of the Minneapolis Fed look at the insurance industry in a November 2014 report (SR 500). Traditional theory about insurance markets assumes fair pricing, with efficient capital markets and supply policies.

But according to Koijen and Yogo, the financial crisis undermined that conventional wisdom. The economists document that life insurers reduced prices for long-term policies dramatically, (in contrast to standard theory that falling interest rates would lead them to *raise* policy prices). Prices for 30-year term annuities were marked down 19 percent relative to actuarial value for life annuities at age 60 and down 57 percent for universal life insurance at age 30. (In ordinary times, insurers earn a 6 percent to 10 percent markup.) They find larger price reductions for policies with looser statutory reserve requirements. This evidence suggests that even large insurance firms ran short of cash during the crisis and needed to raise money quickly by reducing prices to boost sales.


Ralph Koijen


Motohiro Yogo

Koijen and Yogo build a model to understand the forces behind such extraordinary pricing behavior and

conclude that "financial and regulatory frictions have a large and measurable impact on insurance markets." These findings emphasize how important *supply*-side frictions are in consumer financial markets, say the economists, supplementing the demand-side frictions (borrowing constraints, asymmetric information, moral hazard and bounded rationality) that most research has studied. Their study also provides microeconomic evidence for macro models based on financial frictions, "a leading explanation for the Great Recession," they observe.

Generation gaps, legacy costs and reassessments

Research by Andrew Glover, Jonathan Heathcote, Dirk Krueger and José-Víctor Ríos-Rull examines the recession's varying economic impact on the young and the old (SR 498); an earlier version of this paper was described in the September 2011 *Region*.

In a July staff report (SR 501), Tom Holmes and Lee Ohanian study the impact of legacy costs such as pay-with-promises compensation plans when cities (like Detroit) suffer economic shocks, as during the recession. This work also took the form of an economic policy paper (EPP 14-4; also in the June 2014 *Region*).

In another staff report (SR 494), described in the September 2014 *Region*, Ellen McGrattan and Ed Prescott reassess real business cycle theory to see if its central tenets were undercut by the recession, as critics suggest. They find to the contrary. The idea that business cycles are driven, in part, by fluctuations in factor productivity, as RBC argues, is not undermined by government data showing that labor productivity actually rose during 2008-2009, McGrattan and Prescott contend. If investment in intangible capital is accounted for, the link between factor productivity and business cycles persists.

In a similar reexamination of theory, Terry Fitzgerald and Juan Pablo Nicolini released a working paper (WP 713) in May that looks at the Phillips curve relationship between unemployment and future inflation, a link that many economists believe no longer holds. Fitzgerald and Nicolini find that because U.S. monetary policy over recent decades has sought to stabilize nationwide prices, data aggregated at the national level "is uninformative" about the relationship that may exist at smaller geographic levels such as cities or regions.

In fact, among U.S. metropolitan statistical areas from 1976 to 2010, "we find that a 1 percentage point increase in the unemployment rate is associated with a roughly 0.3 percentage point decline in inflation over the next year." They qualify this finding strongly, however, noting that it applies only if particular assumptions are made. "Our results do not prove Phillips curve skeptics wrong," they caution. (This research was also discussed in EPP 13-6, November 2013.)

By the time this *Region* is published, economists at the Minneapolis Fed and elsewhere will have released new research on other aspects of the Great Recession. It has inspired reconsideration of old theory and formulation of new—a silver lining to the cloud of severe economic downturn.

—Douglas Clement


Andrew Glover


Jonathan Heathcote


Dirk Krueger


José-Víctor Ríos-Rull


Tom Holmes


Lee Ohanian


Ellen McGrattan


Ed Prescott


Terry Fitzgerald


Juan Pablo Nicolini