RESEARCH RAP

Abstracts of research papers produced by the economists at the Philadelphia Fed

Economists and visiting scholars at the Philadelphia Fed produce papers of interest to the professional researcher on banking, financial markets, economic forecasting, the housing market, consumer finance, the regional economy, and more. More abstracts may be found at www.philadelphiafed.org/research-and-data/publications/research-rap/. You can find their full working papers at http://www.philadelphiafed.org/research-and-data/publications/working-papers/.

Debt Dilution and Seniority in a Model of Defaultable Sovereign Debt

An important inefficiency in sovereign debt markets is debt dilution, wherein sovereigns ignore the adverse impact of new debt on the value of existing debt and, consequently, borrow too much and default too frequently. A widely proposed remedy is the inclusion of seniority clauses in sovereign debt contracts: Creditors who lent first have priority in any restructuring proceedings. The authors incorporate seniority in a quantitatively realistic model of sovereign debt and find that seniority is quite effective in mitigating the dilution problem. The authors also show theoretically that seniority cannot be fully effective unless the costs of debt restructuring are zero.

Working Paper *13-30. Satyajit Chatterjee, Federal Reserve Bank of Philadelphia; Burcu Eyigungor, Federal Reserve Bank of Philadelphia.*

Measuring the Performance of Banks: Theory, Practice, Evidence, and Some Policy Implications

The unique capital structure of commercial banking — funding production with demandable debt that participates in the economy's payments system — affects various aspects of banking. It shapes banks' comparative advantage in providing financial products and services to informationally opaque customers, their ability to diversify credit and liquidity risk, and how they are regulated, including the need to obtain a charter to operate and explicit and implicit federal guarantees of bank liabilities to reduce the probability of bank runs. These aspects of banking affect a bank's choice of risk versus expected return, which, in turn, affects bank performance. Banks have an incentive to reduce risk to protect the valuable charter from episodes of financial distress, and they also have an incentive to increase risk to exploit the cost-of-funds subsidy of mispriced deposit insurance. These are contrasting incentives tied to bank size. Measuring the performance of banks and its relationship to size requires untangling cost and profit from decisions about risk versus expected-return because both cost and profit are functions of endogenous risk-taking. This chapter gives an overview of two general empirical approaches to measuring bank performance and discusses some of the applications of these approaches found in the literature. One application explains how better diversification available at a larger scale of operations generates scale economies that are obscured by higher levels of risk-taking. Studies of banking cost that ignore endogenous risk-taking find little evidence of scale economies at the largest banks, while those that control for this risk-taking find large scale economies at the largest banks — evidence with important implications for regulation.

Working Paper 13-31. Joseph P. Hughes, Rutgers University; Loretta J. Mester, Federal Reserve Bank of Philadelphia; The Wharton School, University of Pennsylvania.

On the Welfare Properties of Fractional Reserve Banking

Monetary economists have long recognized a tension between the benefits of fractional reserve banking, such as the ability to undertake more profitable (long-term) investment opportunities, and the difficulties associated with fractional reserve banking, such as the risk of insolvency for each bank. The goal of this paper is to show that a specific form of private bank coalition (a joint-liability arrangement) allows the members of the banking system to engage in fractional reserve banking in such a way that the solvency of each member bank is completely guaranteed. Under this arrangement, the paper shows that a lower reserve ratio usually translates into a higher exchange value of bank liabilities, benefitting the consumers who use them as a means of payment.

Working Paper 13-32. Daniel Sanches, Federal Reserve Bank of Philadelphia.

Export Dynamics in Large Devaluations

The authors study the source and consequences of sluggish export dynamics in emerging markets following large devaluations. They document two main features of exports that are puzzling for standard trade models. First, given the change in relative prices, exports tend to grow gradually following a devaluation. Second, high interest rates tend to suppress exports. To address these features of export dynamics, the authors embed a model of endogenous export participation due to sunk and per period export costs into an otherwise standard small open economy. In response to shocks to productivity, the interest rate, and the discount factor, the authors find the model can capture the salient features of export dynamics documented. At the aggregate level, the features giving rise to sluggish exports lead to more gradual net export reversals, sharper contractions and recoveries in output, and endogenous stagnation in labor productivity.

Working Paper 13-33. George Alessandria, Federal Reserve Bank of Philadelphia; Sangeeta Pratap, Hunter College and Graduate Center, City University of New York; Vivian Yue, Board of Governors, Federal Reserve System.

Reverse Kalman Filtering U.S. Inflation with Sticky Professional Forecasts

The authors provide a new way to filter U.S. inflation into trend and cycle components, based on extracting long-run forecasts from the Survey of Professional Forecasters, by operating the Kalman filter in reverse, beginning with observed forecasts, then estimating parameters, and then extracting the stochastic trend in inflation. The trend-cycle model with unobserved components is consistent with numerous studies of U.S. inflation history and is of interest partly because the trend may be viewed as the Fed's evolving inflation target or long-horizon expected inflation. The sluggish reporting attributed to forecasters is consistent with evidence on mean forecast errors. There is considerable evidence of inflation-gap persistence and some evidence of implicit sticky information. But statistical tests show these two widely used perspectives on U.S. inflation forecasts, the unobserved-components model and the sticky-information model, cannot be reconciled.

Working Paper 13-34. James M. Nason, Federal Reserve Bank of Philadelphia; Gregor W. Smith, Queen's University.

Inflation and Real Activity with Firm-Level Productivity Shocks

In the last ten years, there has been an explosion of empirical work examining price setting behavior at the micro level. The work has in turn challenged existing macro models that attempt to explain monetary nonneutrality, because these models are generally at odds with much of the micro price data. In response, economists have developed a second generation of sticky-price models that are state dependent and that include both fixed costs of price adjustment and idiosyncratic shocks. Nonetheless, some ambiguity remains about the extent of monetary nonneutrality that can be attributed to costly price adjustment. The authors' paper takes a step toward eliminating that ambiguity.

Working Paper 13-35. Michael Dotsey, Federal Reserve Bank of Philadelphia; Robert G. King, Boston University, Federal Reserve Bank of Richmond, National Bureau of Economic Research; Alexander L. Wolman, Federal Reserve Bank of Richmond.

House-Price Expectations, Alternative Mortgage Products, and Default

Rapid house-price depreciation and rising unemployment were the main drivers of the huge increase in mortgage default during the downturn years of 2007 to 2010. However, mortgage default was also partly driven by an increased reliance on alternative mortgage products such as pay-option ARMs and interest-only mortgages, which allow the borrower to defer principal amortization. The goal of this paper is to better understand the forces that spurred use of alternative mortgages during the housing boom and the resulting impact on default patterns, relying on a unifying conceptual framework to guide the empirical work. The conceptual framework allows borrowers to choose the extent of mortgage "backloading," the postponement of loan repayment through various mechanisms that constitutes a main feature of alternative mortgages. The model shows that, when future house-price expectations become more favorable, reducing default concerns, mortgage choices shift toward alternative contracts. This prediction is confirmed by empirical evidence showing that an increase in past house-price appreciation, which captures more favorable expectations for the future, raises the market share of alternative mortgages. In addition, using a proportional-hazard default model, the paper tests the fundamental presumption that backloaded mortgages are more likely to default, finding support for this view.

Working Paper 13-36. Jan K. Brueckner, University of California, Irvine; Paul S. Calem, Federal Reserve Bank of Philadelphia; Leonard I. Nakamura, Federal Reserve Bank of Philadelphia.

Do Supply Restrictions Raise the Value of Urban Land? The (Neglected) Role of Production Externalities

Restriction on the supply of new urban land is commonly thought to raise the value of existing urban land. This paper questions this view. The authors develop a tractable production-externality-based circular city model in which firms and workers choose locations and intensity of land use. Consistent with evidence, the model implies exponentially decaying density and price gradients. For plausible parameter values, an increase in the demand for urban land can lead to a smaller increase in urban rents in cities that cannot expand physically because they are less able to exploit the positive external effect of greater employment density.

Working Paper 13-37. Supersedes Working Paper 12-25. Satyajit Chatterjee, Federal Reserve Bank of Philadelphia; Burcu Eyigungor, Federal Reserve Bank of Philadelphia.

Debt Collection Agencies and the Supply of Consumer Credit

The author examines contract enforcement in consumer credit markets by studying the role of third-party debt collectors. In order to identify the effect of debt collectors on credit supply, he constructs a state-level index of the tightness of debt collection laws. The author finds that stricter regulations of third-party debt collectors are associated with a lower number of third-party debt collectors per capita and with fewer openings of revolving lines of credit. One additional restriction on debt collection activity reduces the number of debt collectors per capita by 15.9% of the sample mean and lowers the number of new revolving lines of credit by 2.2% of the sample mean. At the same time, regulations of third-party debt collectors do not affect secured consumer credit, which is consistent with the fact that debt collectors are used to enforce unsecured debt contracts. Stricter regulations of debt collectors decrease credit card recovery rates (by 9% of the sample mean for each additional restriction on debt collection activity), which appears to be the transmission mechanism by which debt collectors affect credit supply. The effect of debt collection laws is significant even when average credit scores are controlled for, meaning that consumer credit risk is not the only driver of credit access. The author's results can help explain the existence of a large market for unsecured consumer credit and shed light on contract enforcement in this market.

Working Paper 13-38. Viktar Fedaseyeu, Bocconi University, Federal Reserve Bank of Philadelphia Visiting Scholar.

Identifying Long-Run Risks: A Bayesian Mixed-Frequency Approach

The authors develop a nonlinear state-space model that captures the joint dynamics of consumption, dividend growth, and asset returns. Building on Bansal and Yaron (2004), their model consists of an economy containing a common predictable component for consumption and dividend growth and multiple stochastic volatility processes. The estimation is based on annual consumption data from 1929 to 1959, monthly consumption data after 1959, and monthly asset return data throughout. The authors maximize the span of the sample to recover the predictable component and use high-frequency data, whenever available, to efficiently identify the volatility processes. Their Bayesian estimation provides strong evidence for a small predictable component in consumption growth (even if asset return data are omitted from the estimation). Three independent volatility processes capture different frequency dynamics; their measurement error specification implies that consumption is measured much more precisely at an annual than monthly frequency; and the estimated model is able to capture key asset-pricing facts of the data.

Working Paper 13-39. Frank Schorfheide, University of Pennsylvania, National Bureau of Economic Research, Federal Reserve Bank of Philadelphia Visiting Scholar; Dongho Song, University of Pennsylvania; Amir Yaron, University of Pennsylvania, National Bureau of Economic Research.

Macro Fiscal Policy in Economic Unions: States as Agents

The American Recovery and Reinvestment Act (ARRA) was the U.S. government's fiscal response to the Great Recession. An important component of ARRA's $796 billion proposed budget was $318 billion in fiscal assistance to state and local governments. The authors examine the historical experience of federal government transfers to state and local governments and their impact on aggregate GDP growth, recognizing that lower-tier governments are their own fiscal agents. The SVAR analysis explicitly incorporates federal intergovernmental transfers, disaggregated into project (e.g., infrastructure) aid and welfare aid, as separate fiscal policies in addition to federal government purchases and federal net taxes on households and firms. A narrative analysis provides an alternative identification strategy. To better understand the estimated aggregate effects of aid on the economy, the authors also estimate a behavioral model of state responses to such assistance. The analysis reaches three conclusions. First, aggregate federal transfers to state and local governments are less stimulative than are transfers to households and firms. It is important to evaluate the two policies separately. Second, within intergovernmental transfers, matching (price) transfers for welfare spending are more effective for stimulating GDP growth than are unconstrained (income) transfers for project spending. Matching aid is fully spent on welfare services or middle-class tax relief; half of project aid is saved and only slowly spent in future years. Third, simulations using the SVAR specification suggest ARRA assistance would have been 30 percent more effective in stimulating GDP growth had the share spent on government purchases and project aid been fully allocated to private sector tax relief and to matching aid to states for lower-income support.

Working Paper 13-40. Gerald Carlino, Federal Reserve Bank of Philadelphia; Robert P. Inman, The Wharton School, University of Pennsylvania.

The Political Polarization Index

American politics have become increasingly polarized in recent decades. To the extent that political polarization introduces uncertainty about economic policy, this pattern may have adversely affected the economy. According to existing theories, a rise in the volatility of fiscal shocks faced by individuals should result in a decline in economic activity. Moreover, if polarization is high around election dates, businesses and households may be induced to delay decisions that involve high reversibility costs (such as investment or hiring under search costs). Testing these theories has been challenging given the low frequency at which existing polarization measures have been computed (in most studies, the series is available only biannually). In this paper, the author provides a novel high-frequency measure of polarization, the political polarization index. The measure is constructed monthly for the period 1981–2013 using a search-based approach. The author documents that while the index fluctuates around a constant mean for most of the sample period prior to 2007, it has exhibited a steep increasing trend since the Great Recession. Evaluating the effects of this increase using a simple VAR, the author finds that an innovation to polarization significantly discourages investment, output, and employment. Moreover, these declines are persistent, which may help explain the slow recovery observed since the 2007 recession ended.

Working Paper 13-41. Marina Azzimonti, Federal Reserve Bank of Philadelphia.

Dynamic Market Participation and Endogenous Information Aggregation

This paper studies information aggregation in financial markets with recurrent investor exit and entry. A dynamic general equilibrium model of asset trading with private information and collateral constraints is considered. Investors differ in their aversion to Knightian uncertainty: When uncertainty is high, some investors exit the market. Since exiting investors' information is not fully revealed by prices, conditional return volatility and risk premia both increase. Data on institutional investors' holdings of individual stocks show that investor exits indeed move negatively with price informativeness. The model also implies that exit is more likely when wealth is more concentrated in the hands of less uncertainty-averse investors. The model thus predicts less informative prices toward the end of a long boom, as seen in the data. Moreover, economies with looser collateral constraints should see more volatility due to exit and partial revelation. Higher capital requirements can improve welfare by inducing more information revelation by prices.

Working Paper 13-42. Edison G. Yu, Federal Reserve Bank of Philadelphia.

The Dynamics of Public Investment Under Persistent Electoral Advantage

This paper studies the effects of asymmetries in reelection probabilities across parties on public policy and their subsequent propagation to the economy. The struggle between groups that disagree on targeted public spending (e.g., pork) results in governments being endogenously short-sighted: Systematic underinvestment in infrastructure and overspending on targeted goods arise, above and beyond what is observed in symmetric environments. Because the party enjoying an electoral advantage is less short-sighted, it devotes a larger proportion of revenues to productive investment. Hence, political turnover induces economic fluctuations in an otherwise deterministic environment. The author characterizes analytically the long-run distribution of allocations and shows that output increases with electoral advantage, despite the fact that governments expand. Volatility is non-monotonic in electoral advantage and is an additional source of inefficiency. Using panel data from U.S. states, the author confirms these findings.

Working Paper 13-43. Marina Azzimonti, Federal Reserve Bank of Philadelphia.

Polarized Business Cycles

The authors are motivated by four stylized facts computed for emerging and developed economies: (i) business cycle movements are wider in emerging countries; (ii) economies in emerging countries experience greater economic policy uncertainty; (iii) emerging economies are more polarized and less politically stable; and (iv) economic policy uncertainty is positively related to political polarization. The authors show that a standard real business cycle (RBC) model augmented to incorporate political polarization, a "polarized business cycle" (PBC) model, is consistent with these facts. The authors' main hypothesis is that fluctuations in economic variables are not only caused by innovations to productivity, as traditionally assumed in macroeconomic models, but also by shifts in political ideology. Switches between left-wing and right-wing governments generate uncertainty about the returns to private investment, and this affects real economic outcomes. Since emerging economies are more polarized than developed ones, the effects of political turnover are more pronounced. This translates into higher economic policy uncertainty and amplifies business cycles. The authors derive their results analytically by fully characterizing the long-run distribution of economic and fiscal variables. They then analyze the effect of a permanent increase in polarization on PBCs.

Working Paper 13-44. by Marina Azzimonti, Federal Reserve Bank of Philadelphia; Matthew Talbert, University of Texas, Austin.

Entrepreneurial Tail Risk: Implications for Employment Dynamics

New businesses are important for job creation and have contributed more than proportionally to the expansion in the 1990s and the decline of employment after the 2007 recession. This paper provides a framework for analyzing determinants of business creation in a world where new business owners are exposed to idiosyncratic risk due to initial imperfect diversification. This paper uses this framework to analyze how entrepreneurial risk has changed over time and how this has affected employment in the U.S. Conditions are provided under which entrepreneurial risk can be identified using micro data on the size distribution of new businesses and their exit rates. The baseline model considers both upside and downside risk. Applied to U.S. time series data, structural estimates suggest that higher upside risk explains much of the high job creation in the late 1990s. Time variation in risk explains around 40% of the variation in employment of new businesses. Reduced form results show that this relationship is strongest in IT-related industries. When restricting the model to a single risk factor, the explanatory power for employment drops by 25% to 50% compared to the baseline estimates.

Working Paper 13-45. Thorsten Drautzburg, Federal Reserve Bank of Philadelphia.

Fiscal Stimulus and Distortionary Taxation

The authors quantify the fiscal multipliers in response to the American Recovery and Reinvestment Act (ARRA) of 2009. They extend the benchmark Smets-Wouters (2007) New Keynesian model, allowing for credit-constrained households, the zero lower bound, government capital, and distortionary taxation. The posterior yields modestly positive short-run multipliers around 0.53 and modestly negative long-run multipliers around -0.36. The authors explain the central empirical findings with the help of a simple three equation New Keynesian model with sticky wages and credit-constrained households.

Working Paper 13-46. Thorsten Drautzburg, Federal Reserve Bank of Philadelphia; Harald Uhlig, University of Chicago.

Index of 2013 *Business Review* Articles

100 YEARS™

FEDERAL RESERVE SYSTEM

To Mark Our Centennial

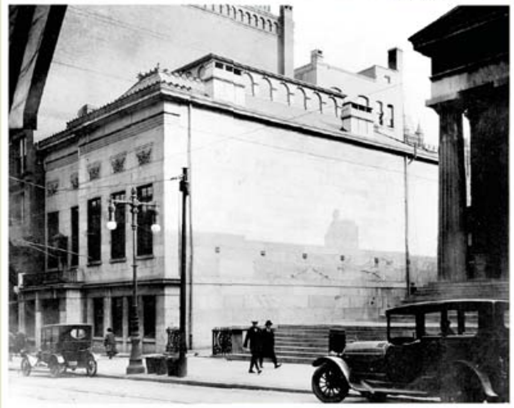
To mark the 100th anniversaries of the signing of the Federal Reserve Act in 1913 and the opening of the Federal Reserve Banks in 1914, the Fed is asking scholars, historians, and other members of the public to help compile an inventory of records, collections, and artifacts related to the history of the nation's central bank. Do you know of materials that should be included? Information may be submitted at http://www.federalreserve.gov/apps/contactus/feedback.aspx.

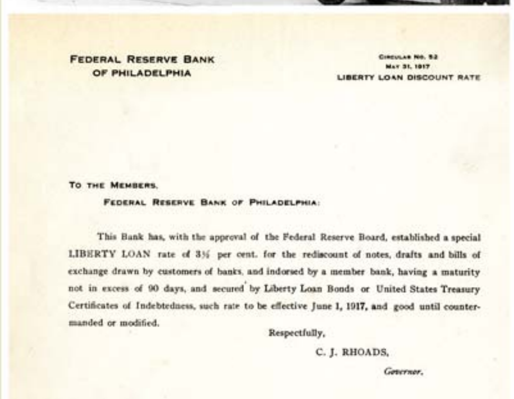
The inventory will give researchers, academics, and others interested in studying U.S. central banking a single point of electronic access to documents, photographs, and audio and video recordings from sources across the Federal Reserve System, universities, and private collections. Information is also being included about material not yet available online

On December 23, 1913, President Woodrow Wilson signed the Federal Reserve Act, establishing the Federal Reserve System as the U.S. central bank. Its mission is to conduct the nation's monetary policy; supervise and regulate banks; maintain the stability of the financial system; and provide financial services to depository institutions, the U.S. government, and foreign official institutions.

Congress designed the Fed with a decentralized structure. The Federal Reserve Bank of Philadelphia — serving eastern Pennsylvania, southern New Jersey, and Delaware — is one of 12 regional Reserve Banks that, together with the seven-member Board of Governors in Washington, D.C., make up the Federal Reserve System. The Board, appointed by the President of the United States and confirmed by the Senate, represents the public sector, while the Reserve Banks and the local citizens on their boards of directors represent the private sector.

The Research Department of the Philadelphia Fed supports the Fed's mission through its research; surveys of firms and forecasters; reports on banking, markets, and the regional and U.S. economies; and publications such as the *Business Review*.





FEDERAL RESERVE BANK
OF PHILADELPHIA

CIRCULAR NO. 52
MAY 31, 1917
LIBERTY LOAN DISCOUNT RATE

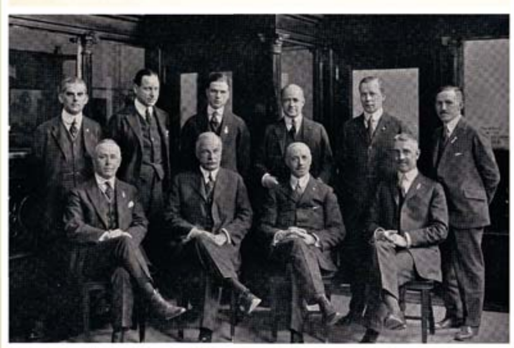
TO THE MEMBERS,
FEDERAL RESERVE BANK OF PHILADELPHIA:

This Bank has, with the approval of the Federal Reserve Board, established a special LIBERTY LOAN rate of 3½ per cent. for the rediscount of notes, drafts and bills of exchange drawn by customers of banks, and indorsed by a member bank, having a maturity not in excess of 90 days, and secured by Liberty Loan Bonds or United States Treasury Certificates of Indebtedness, such rate to be effective June 1, 1917, and good until countermanded or modified.

Respectfully,

C. J. RHOADS,

Governor.



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