

Research Update

These papers by Philadelphia Fed economists, analysts, and visiting scholars represent preliminary research that is being circulated for discussion purposes.

The views expressed in these papers are solely those of the authors and should not be interpreted as reflecting the views of the Federal Reserve Bank of Philadelphia or Federal Reserve System.

Financial Characteristics of Cost of Funds Indexed Loans

Two recent articles by Hancock and Passmore (2016) and Passmore and von Hafften (2017) make several suggestions for improving the home mortgage contract to make homeownership more achievable for creditworthy borrowers. Though the proposals in the two papers differ in some aspects, one common feature is an adjustable rate indexed to a cost of funds (COF) measure. Such indices are based on the interest expense as a fraction of liability balance for one or a group of depository institutions. One of these, the 11th District Cost of Funds (COF) Index, was in wide use in the 1980s and 1990s, but use has fallen off since then. COF indices have the advantage that they are less volatile than market-based indices such as the one-year U.S. Treasury rate, so that borrowers are not exposed to rapid increases in payments in a rising rate environment. We analyze COF-indexed adjustable-rate mortgages (ARMs) from the point of view of the lender. First we develop a methodology for constructing a liability portfolio that closely tracks the specific COF index proposed by Hancock and Passmore and Passmore and von Hafften. We then explore the financial characteristics of this liability portfolio. We show that the liability portfolio, and by implication the

mortgages it would fund, share a characteristic of fixed-rate mortgages: Values can vary significantly from par if rates change. This creates two problems for lenders: Pricing of COF-indexed ARMs is difficult because it depends not only on current interest rates but also on interest rates when principal is repaid, either through amortization or prepayment. Second, deviations from par make mortgage prepayment options valuable, so that lenders offering the product must manage option risk as well as interest rate risk. We conclude that while mortgages using a COF index have clear benefits for borrowers, they also are more difficult for lenders to price accurately. Further, once they are in lenders' portfolios, they increase the complexity of interest rate risk management. While these issues do not imply that COF indices cannot be part of innovative new mortgage designs, understanding their financial characteristics may contribute to the search for a better mortgage

Working Paper 19-25. Patrick Greenfield, Federal Reserve Bank of San Francisco; Arden Hall, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department.

Should Central Banks Issue Digital Currency?

We study how the introduction of a central bank-issued digital currency affects interest rates, the level of economic activity, and welfare in an environment where both central bank money and private bank deposits are used in exchange. Banks in our model are financially constrained, and the liquidity premium on bank deposits affects the level of aggregate investment. We study the optimal design of a digital currency in this setting, including whether it should pay interest and how widely it should circulate. We highlight an important policy tradeoff: While a digital currency tends to promote efficiency in exchange, it can also crowd out bank deposits, raise banks' funding costs, and decrease investment. Despite these effects, introducing a central bank digital currency often raises welfare.

Working Paper 19-26. Todd Keister, Rutgers University and Federal Reserve Bank of Philadelphia Visiting Scholar; Daniel Sanches, Federal Reserve Bank of Philadelphia Research Department.

Pre-event Trends in the Panel Event-Study Design

We consider a linear panel event-study design in which unobserved confounds may be related both to the outcome and to the policy variable of interest. We provide sufficient conditions to identify the causal effect of the policy by exploiting covariates related to the policy only through the confounds. Our model implies a set of moment equations that are linear in parameters. The effect of the policy can be estimated by 2SLS, and causal inference is valid even when endogeneity leads to pre-event trends ("pre-trends") in the outcome. Alternative approaches perform poorly in our simulations.

Working Paper 19-27. Simon Freyaldenhoven, Federal Reserve Bank of Philadelphia; Christian Hansen, University of Chicago; Jesse M. Shapiro, Brown University and NBER.

Do Minimum Wage Increases Benefit Intended Households? Evidence from the Performance of Residential Leases

Prior studies debating the effects of changes to the minimum wage concentrate on impacts on household income and spending or employment. We extend this debate by examining the impact of changes to the minimum wage on expenses associated with shelter, a previously unexplored area. Increases in state minimum wages significantly reduce the incidence of renters defaulting on their lease contracts by 1.29 percentage points over three months, relative to similar renters who did not experience an increase in the minimum wage. This represents 25.7 percent fewer defaults posttreatment in treated states. To put this into perspective, a 1 percent increase in minimum wage translates into a 2.6 percent decrease in rental default. This evidence is consistent with wage increases having an immediate impact on relaxing renter budget constraints. However, this effect slowly decreases over time as landlords react to wage increases by increasing rents. Our analysis is based on a unique data set that tracks household rental payments.

Working Paper 19-28. Sumit Agarwal, National University of Singapore; Brent W. Ambrose, The Pennsylvania State University and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar; Moussa Diop, University of Wisconsin–Madison and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar.

The Effects of Gentrification on the Well-Being and Opportunity of Original Resident Adults and Children

We use new longitudinal census microdata to provide the first causal evidence of how gentrification affects a broad set of outcomes for original resident adults and children. Gentrification modestly increases out-migration, though movers are not made observably worse off and neighborhood change is driven primarily by changes to in-migration. At the same time, many original resident adults stay and benefit from declining poverty exposure and rising house values. Children benefit from increased exposure to higher-opportunity neighborhoods, and some are more likely to attend and complete college. Our results suggest that accommodative policies, such as increasing the supply of housing in high-demand urban areas, could increase the opportunity benefits we find, reduce out-migration pressure, and promote long-term affordability.

Working Paper 19-30. Quentin Brummet, NORC at the University of Chicago; Davin Reed, Federal Reserve Bank of Philadelphia Community Development and Regional Outreach.

Freeway Revolts!

Freeway revolts were widespread protests across the U.S. following early urban interstate construction in the mid-1950s. We present theory and evidence from panel data on neighborhoods and travel behavior to show that diminished quality of life from freeway disamenities inspired the revolts, affected the allocation of freeways within cities, and changed city structure. First, actual freeway construction diverged from initial plans in the wake of the growing freeway revolts and subsequent policy responses, especially in central neighborhoods. Second, freeways caused slower growth in population, income, and land values in central areas but faster growth in outlying areas. These patterns suggest that in central areas, freeway disamenity effects exceeded small access benefits. Third, in a quantitative general equilibrium spatial model, the aggregate benefits from burying or capping freeways are large and concentrated downtown. This result suggests that targeted mitigation policies could improve welfare and helps explain why opposition to freeways is often observed in central neighborhoods. Disamenities from freeways, versus their commuting benefits, likely played a significant role in the decentralization of U.S. cities.

Working Paper 19-29. Jeffrey Brinkman, Federal Reserve Bank of Philadelphia Research Department; Jeffrey Lin, Federal Reserve Bank of Philadelphia Research Department.

History Remembered: Optimal Sovereign Default on Domestic and External Debt

Infrequent but turbulent overt sovereign defaults on domestic creditors are a “forgotten history” in macroeconomics. We propose a heterogeneous-agents model in which the government chooses optimal debt and default on domestic and foreign creditors by balancing distributional incentives versus the social value of debt for self-insurance, liquidity, and risk-sharing. A rich feedback mechanism links debt issuance, the distribution of debt holdings, the default decision, and risk premia. Calibrated to euro zone data, the model is consistent with key long-run and debt-crisis statistics. Defaults are rare (1.2 percent frequency) and preceded by surging debt and spreads. Debt sells at the risk-free price most of the time, but the government’s lack of commitment reduces sustainable debt sharply.

Working Paper 19-31. Pablo D’Erasmus, Federal Reserve Bank of Philadelphia Research Department; Enrique G. Mendoza, University of Pennsylvania, NBER, PIER Federal Reserve Bank of Philadelphia Visiting Scholar.