

Research Update

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The Consequences of Student Loan Credit Expansions: Evidence from Three Decades of Default Cycles

This paper studies the link between credit availability and student loan repayment using administrative federal student loan data. We demonstrate that expansions and contractions in federal student loan credit to institutions with high default rates explain most of the time series variation in student loan defaults between 1980 and 2010. Expansions in loan eligibility between 1976 and 1988 led to the entry of new, high-risk institutions and to default rates exceeding 30 percent in the late 1980s. Credit access was subsequently tightened through strict institutional and student accountability measures. This contracted credit availability at the highest default rate institutions, which in turn caused an exodus of institutions with high default rates, resulting in lower default rates on student loans. After 1992, the cycle was repeated, with credit access gradually loosened by unwinding many of the pre-1992 reforms. We confirm this time series narrative by examining discrete policy changes governing access to credit to show that tightening credit supply led to the closure of high-default schools and that the relaxation of accountability rules resulted in their expansion. Our estimates imply that 85 percent of the increase in default between 1980 and 1990, and 95 percent of the decrease in default between 1990 and 2000 is driven by schools entering and exiting loan programs. One-third of the recent increase in default is associated with the entry of online programs following the relaxation of rules for lending to online schools, and another third is associated with the abolition of rules limiting the share of revenue coming from federal programs.

Working Paper 19-32. Adam Looney, The Brookings Institution; Constantine Yannelis, University of Chicago Booth School of Business and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar.

How Important Are Local Community Banks to Small-Business Lending? Evidence from Mergers and Acquisitions

The authors investigate the shrinking community-banking sector and the impact on local small-business lending (SBL) in the context of mergers and acquisitions. From all mergers that involved community banks, they examine the varying impact on SBL depending on the local presence of the acquirers' and the targets' operations prior to acquisitions. Our results indicate that, relative to counties where the acquirer had operations before the merger, local SBL declined significantly more in counties where only the target had operations before the merger. This result holds even after controlling for the general local SBL market or local economic trends. These findings are consistent with an argument that SBL funding has been directed (after the mergers) toward the acquirers' counties. The authors find even stronger evidence during and after the financial crisis. Overall, the authors find evidence that local community banks have continued to play an important role in providing funding to local small businesses. The absence of local community banks that became a target of a merger or acquisition by nonlocal acquirers has, on average, led to local SBL credit gaps that were not filled by the rest of the banking sector.

Working Paper 18-18 Revised. Julapa Jagtiani, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Raman Quinn Maingi, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department.

The Well-Being of Nations: Estimating Welfare from International Migration

The limitations of GDP as a measure of welfare are well known. We propose a new method of estimating the well-being of nations. Using gross bilateral international migration flows and a discrete choice model in which everyone in the world chooses a country in which to live, we estimate each country's overall quality of life. Our estimates, by relying on revealed preference, complement previous estimates of economic well-being that consider only income or a small number of factors, or rely on structural assumptions about how these factors contribute to well-being.

Working Paper 19-33. Sanghoon Lee, University of British Columbia; Seung Hoon Lee, Georgia Institute of Technology; Jeffrey Lin, Federal Reserve Bank of Philadelphia Research Department.

Cyclical Labor Income Risk

We investigate cyclical variance and skewness of household labor income risk using PSID data. There are five main findings. First, we find that heads' labor income exhibits countercyclical variance and procyclical skewness. Second, the cyclical variance of hourly wages is muted, suggesting that heads' labor income risk is mainly coming from the volatility of hours. Third, younger households face stronger cyclical variance of income volatility than older ones, although the level of volatility is lower for the younger ones. Fourth, while a second earner helps lower the level of skewness, it does not mitigate the volatility of household labor income risk. Meanwhile, government taxes and transfers are found to mitigate the level and cyclical variance of labor income risk volatility. Finally, among heads with strong labor market attachment, the cyclical variance of labor income volatility becomes weaker, while the cyclical variance of skewness remains.

Working Paper 19-34. Makoto Nakajima, Federal Reserve Bank of Philadelphia Research Department; Vladimir Smirnyagin, University of Minnesota.

Formative Experiences and the Price of Gasoline

An individual's initial experiences with a common good, such as gasoline, can shape their behavior for decades. We first show that the 1979 oil crisis had a persistent negative effect on the likelihood that individuals that came of driving age during this time drove to work in the year 2000 (i.e., in their mid-30s). The effect is stronger for those with lower incomes and those in cities. Combining data on many cohorts, we then show that large increases in gasoline prices between the ages of 15 and 18 significantly reduce both (i) the likelihood of driving a private automobile to work and (ii) total annual vehicle miles traveled later in life, while also increasing public transit use. Differences in driver license age requirements generate additional variation in the formative window. These effects cannot be explained by contemporaneous income and do not appear to be only due to increased costs from delayed driving skill acquisition. Instead, they seem to reflect the formation of preferences for driving or persistent changes in the perceived costs of driving.

Working Paper 19-35. Christopher Severen, Federal Reserve Bank of Philadelphia Research Department; Arthur A. van Benthem, University of Pennsylvania and NBER.

The Paper Trail of Knowledge Spillovers: Evidence from Patent Interferences

We show evidence of localized knowledge spillovers using a new database of U.S. patent interferences terminated between 1998 and 2014. Interferences resulted when two or more independent parties submitted identical claims of invention nearly simultaneously. Following the idea that inventors of identical inventions share common knowledge inputs, interferences provide a new method for measuring knowledge spillovers. Interfering inventors are 1.4 to 4 times more likely to live in the same local area than matched control pairs of inventors. They are also more geographically concentrated than citation-linked inventors. Our results emphasize geographic distance as a barrier to tacit knowledge flows.

Working Paper 17-44 Revised. Ina Ganguli, University of Massachusetts–Amherst; Jeffrey Lin, Federal Reserve Bank of Philadelphia Research Department; Nicholas Reynolds, Brown University.

The Community Reinvestment Act (CRA) and Bank Branching Patterns

This paper examines the relationship between the Community Reinvestment Act (CRA) and bank branching patterns, measured by the risk of branch closure and the net loss of branches at the neighborhood level, in the aftermath of Great Recession. Between 2009 and 2017, there was a larger decline in the number of bank branches in lower-income neighborhoods than in more affluent ones, raising concerns about access to mainstream financial services. However, once we control for supply and demand factors that influence bank branching decisions, we find generally consistent evidence that the CRA is associated with a lower risk of branch closure, and the effects are stronger for neighborhoods with fewer branches, for larger banks, and for major metro areas. The CRA also reduces the risk of net bank losses in lower-income neighborhoods. The evidence from our analysis is consistent with the notion that the CRA helps banks meet the credit needs of underserved communities and populations by ensuring the continued presence of brick-and-mortar branches.

Working Paper 19-36. Lei Ding, Federal Reserve Bank of Philadelphia; Carolina K. Reid, University of California, Berkeley.

How Wide Is the Firm Border?

We examine the within- and across-firm shipment decisions of tens of thousands of goods-producing and goods-distributing establishments. This allows us to quantify the normally unobservable forces that determine firm boundaries; that is, which transactions are mediated by ownership control, as opposed to contracts or markets. We find firm boundaries to be an economically significant barrier to trade: Having an additional vertically integrated establishment in a given destination zip code has the same effect on shipment volumes as a 40 percent reduction in distance. These effects are larger for high value-to-weight products, for faraway destinations, for differentiated products, and for IT-intensive industries.

Working Paper 19-37. Enghin Atalay, Federal Reserve Bank of Philadelphia Research Department; Ali Hortaçsu, University of Chicago; Mary Jialin Li, Compass Lexecon; Chad Syverson, University of Chicago.

Competition and Health-Care Spending: Theory and Application to Certificate of Need Laws

Hospitals and other health-care providers in 34 states must obtain a Certificate of Need (CON) from a state board before opening or expanding, leading to reduced competition. We develop a theoretical model of how market concentration affects health-care spending. Our theoretical model shows that increases in concentration, such as those brought about by CON, can either increase or decrease spending. Our model predicts that CON is more likely to increase spending in markets in which costs are low and patients are sicker. We test our model using spending data from the Household Component of the Medical Expenditure Panel Survey (MEPS).

Working Paper 19-38. James Bailey, Providence College and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar; Tom Hamami, Ripon College.

The Mortgage Prepayment Decision: Are There Other Motivations Beyond Refinance and Move?

Borrowers terminate residential mortgages for a variety of reasons. Prepayments and defaults have always been distinguishable, and researchers have recently distinguished between prepayments involving a move and other prepayments. But these categories still combine distinct decisions. For example, a borrower may refinance to obtain a lower interest rate or to borrow a larger amount. By matching mortgage servicing and credit bureau records, we are able to distinguish among several motivations for prepayment: simple refinancing, cash-out refinancing, mortgage payoff, and move. Using multinomial logit to estimate a competing hazard model for these types of prepayments plus default, we demonstrate that these outcomes are distinct, with some outcomes showing quite different relationships to standard predictive variables, such as refinance incentive, credit score, and loan-to-value ratio, than in models that combine outcomes. The implication of these findings is that models that aggregate prepayment types do not adequately describe borrower motivations.

Working Paper 19-39. Arden Hall, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Raman Quinn Maingi, New York University.

Policy Inertia, Election Uncertainty and Incumbency Disadvantage of Political Parties

We document that postwar U.S. elections show a strong pattern of “incumbency disadvantage”: If a party has held the presidency of the country or the governorship of a state for some time, that party tends to lose popularity in the subsequent election. We show that this fact can be explained by a combination of policy inertia and unpredictability in election outcomes. A quantitative analysis shows that the observed magnitude of incumbency disadvantage can arise in several different models of policy inertia. Normative and positive implications of policy inertia leading to incumbency disadvantage are explored.

Working Paper 19-40. Satyajit Chatterjee, Federal Reserve Bank of Philadelphia Research Department; Burcu Eyigungor, Federal Reserve Bank of Philadelphia Research Department.

Concentration of Control Rights in Leveraged Loan Syndicates

We find that corporate loan contracts frequently concentrate control rights with a subset of lenders. Despite the rise in term loans without financial covenants—so-called covenant-lite loans—borrowing firms’ revolving lines of credit almost always retain traditional financial covenants. This split structure gives revolving lenders the exclusive right and ability to monitor and to renegotiate the financial covenants, and we confirm that loans with split control rights are still subject to the discipline of financial covenants. We provide evidence that split control rights are designed to mitigate bargaining frictions that have arisen with the entry of nonbank lenders and became apparent during the financial crisis.

Working Paper 19-41. Mitchell Berlin, Federal Reserve Bank of Philadelphia Research Department; Greg Nini, Drexel University and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Edison G. Yu, Federal Reserve Bank of Philadelphia Research Department.

Localized Knowledge Spillovers: Evidence from the Spatial Clustering of R&D Labs and Patent Citations

Buzard et al. (2017) show that American R&D labs are highly spatially concentrated even within a given metropolitan area. We argue that the geography of their clusters is better suited for studying knowledge spillovers than are states, metropolitan areas, or other political or administrative boundaries that have predominantly been used in previous studies. In this paper, we assign patents and citations to these newly defined clusters of R&D labs. Our tests show that the localization of knowledge spillovers, as measured via patent citations, is strongest at small spatial scales and diminishes with distance. On average, patents within a cluster are about two to four times more likely to cite an inventor in the same cluster than one in a control group. Of import, we find that the degree of localization of knowledge spillovers will be understated in samples based on metropolitan area definitions compared to samples based on the R&D clusters. At the same time, the strength of knowledge spillovers varies widely between clusters. The results are robust to the specification of patent technological categories, the method of citation matching, and alternate cluster definitions.

Working Paper 19-42. Kristy Buzard, Syracuse University and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Gerald A. Carlino, Federal Reserve Bank of Philadelphia Research Department; Robert M. Hunt, Federal Reserve Bank of Philadelphia Consumer Finance Institute; Jake K. Carr, The Ohio State University; Tony E. Smith, University of Pennsylvania and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar.

Relationship Networks in Banking Around a Sovereign Default and Currency Crisis

We study how banks’ exposure to a sovereign crisis gets transmitted onto the corporate sector. To do so, we use data on the universe of banks and firms in Argentina during the crisis of 2001. We build a model characterized by matching frictions in which firms establish (long-term) relationships with banks that are subject to balance sheet disruptions. Credit relationships with banks more exposed to the crisis suffer the most. However, this relationship-level effect overstates the true cost of the crisis since profitable firms (e.g., exporters after a devaluation) might find it optimal to switch lenders, reducing the negative impact on overall credit and activity. Using linked bank-firm and firm-level data we find evidence largely consistent with our theory.

Working Paper 19-43. Pablo D’Erasmus, Federal Reserve Bank of Philadelphia Research Department; Hernán Moscoso Boedo, University of Cincinnati; María Pía Olivero, Drexel University and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Máximo Sangiacomo, Central Bank of Argentina.

Heterogeneity in Decentralized Asset Markets

We study a search and bargaining model of asset markets in which investors' heterogeneous valuations for the asset are drawn from an arbitrary distribution. We present a solution technique that makes the model fully tractable and allows us to provide a complete characterization of the unique equilibrium, in closed form, both in and out of steady state. Using this characterization, we derive several novel implications that highlight the importance of heterogeneity. In particular, we show how some investors endogenously emerge as intermediaries, even though they have no advantage in contacting other agents or holding inventory; and we show how heterogeneity magnifies the impact of search frictions on asset prices, misallocation, and welfare.

Working Paper 19-44. Julien Hugonnier, EPFL, Swiss Finance Institute, and CEPR; Benjamin Lester, Federal Reserve Bank of Philadelphia Research Department; Pierre-Olivier Weill, University of California, Los Angeles, NBER, CEPR, and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar.

Institutional Investors and the U.S. Housing Recovery

We study the house price recovery in the U.S. single-family residential housing market since the outbreak of the mortgage crisis, which, in contrast to the preceding housing boom, was not accompanied by a rise in homeownership rates. Using comprehensive property-level transaction data, we show that this phenomenon is largely explained by the emergence of institutional investors. By exploiting heterogeneity in a county's exposure to local lending conditions and to government programs that affected investors' access to residential properties, we estimate that the increasing presence of institutions in the housing market explains over half of the increase in real house price appreciation rates between 2006 and 2014. We further demonstrate that institutional investors contribute to the improvement of the local housing market by reducing vacancy rates as they shorten the amount of time distressed properties stay in REO. Additionally, institutional investors help lower local unemployment rates by increasing local construction employment. However, institutional investors are responsible for most of the declines in the homeownership rates.

Working Paper 19-45. Lauren Lambie-Hanson, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Wenli Li, Federal Reserve Bank of Philadelphia Research Department; Michael Slonkosky, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department.

Personal Bankruptcy as a Real Option

We provide a novel explanation to the longstanding puzzle of the "missing bankruptcy filings." Even though a household with a negative net worth will receive contemporaneous benefit from bankruptcy, there may be greater insurance value from delaying the filing. Household bankruptcy is thus an American-style put option, which is not necessarily exercised even if the option is "in the money." Based on the value functions in the household's dynamic programming problem, we formulate the value of the bankruptcy option as well as the exercise price. We estimate a life-cycle model in which households choose the optimal time to exercise their bankruptcy option.

Working Paper 19-46. Guozhong Zhu, University of Alberta; Vyacheslav Mikhed, Federal Reserve Bank of Philadelphia Consumer Finance Institute; Barry Scholnick, University of Alberta and Federal Reserve Bank of Philadelphia Consumer Finance Institute Visiting Scholar.

Fintech Lending and Mortgage Credit Access

Following the 2008 financial crisis, mortgage credit tightened and banks lost significant mortgage market share to nonbank lenders, including to fintech firms recently. Have fintech firms expanded credit access, or are their customers similar to those of traditional lenders? Unlike in small-business and unsecured-consumers lending, fintech mortgage lenders do not have the same incentives or flexibility to use alternative data for credit decisions because of stringent mortgage origination requirements. Fintech loans are broadly similar to those made by traditional lenders, despite innovations in the marketing and the application process. However, nonbanks market to consumers with weaker credit scores than do banks, and fintech lenders have greater market shares in areas with lower credit scores and higher mortgage denial rates.

Working Paper 19-47. Julapa Jagtiani, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Lauren Lambie-Hanson, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Timothy Lambie-Hanson, Haverford College.

Credit, Bankruptcy, and Aggregate Fluctuations

We document the cyclical properties of unsecured consumer credit (procyclical and volatile) and of consumer bankruptcies (countercyclical and very volatile). Using a growth model with household heterogeneity in earnings and assets with access to unsecured credit (because of bankruptcy costs) and aggregate shocks, we show that the cyclical behavior of household earnings growth accounts for these properties, albeit not for the large volatility of credit. We find that tilting household consumption toward goods that can be purchased on credit and a slight countercyclicality in the terms of access to credit match the sizes of credit and bankruptcy volatilities. We also find that when the right to file for bankruptcy does not exist, unsecured credit is countercyclical.

Working Paper 19-48. Makoto Nakajima, Federal Reserve Bank of Philadelphia Research Department; José-Víctor Ríos-Rull, University of Pennsylvania and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar.

Fast Locations and Slowing Labor Mobility

Declining internal migration in the United States is driven by increasing home attachment in locations with initially high rates of population turnover. These “fast” locations were the population growth destinations of the 20th century, where home attachments were low but have increased as regional population growth has converged. Using a novel measure of attachment, this paper estimates a structural model of migration that distinguishes moving frictions from home utility. Simulations quantify candidate explanations of the decline. Rising home attachment accounts for most of the decline not attributable to population aging, and its effect is consistent with the observed spatial pattern.

Working Paper 19-49. Patrick Coate, National Council on Compensation Insurance; Kyle Mangum, Federal Reserve Bank of Philadelphia Research Department.