

Research Update

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From Incurred Loss to Current Expected Credit Loss (CECL): A Forensic Analysis of the Allowance for Loan Losses in Unconditionally Cancelable Credit Card Portfolios

The Current Expected Credit Loss (CECL) framework represents a new approach for calculating the allowance for credit losses. Credit cards are the most common form of revolving consumer credit and are likely to present conceptual and modeling challenges during CECL implementation. We look back at nine years of account-level credit card data, starting with 2008, over a time period encompassing the bulk of the Great Recession as well as several years of economic recovery. We analyze the performance of the CECL framework under plausible assumptions about allocations of future payments to existing credit card loans, a key implementation element. Our analysis focuses on three major themes: defaults, balances, and credit loss. Our analysis indicates that allowances are significantly impacted by specific payment allocation assumptions as well as downturn economic conditions. We also compare projected allowances with realized credit losses and observe a significant divergence resulting from the revolving nature of credit card portfolios. We extend our analysis across segments of the portfolio with different risk profiles. Interestingly, less risky segments of the portfolio are proportionally more impacted by specific payment assumptions and downturn economic conditions. We also analyze the impact of macroeconomic forecast error and find that it can be substantial and can be impacted by CECL implementation design features. Overall, our findings suggest that the effect of the new allowance framework on a specific credit card portfolio will depend critically on its risk profile. Thus, our findings should be interpreted qualitatively, rather than quantitatively. Finally, the goal is to gain a better understanding of the sensitivity of allowances to plausible variations in assumptions about the allocation of future payments to present credit card loans. Thus, we do not offer specific best practice guidance.

Supersedes Working Paper 19-08.

Working Paper 20-09. José J. Canals-Cerdá, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department.

Expanded GDP for Welfare Measurement in the 21st Century

The information revolution currently underway has changed the economy in ways that are hard to measure using conventional GDP procedures. The information available to consumers has increased dramatically as a result of the Internet and its applications, and new mobile communication devices have greatly increased the speed and reach of its accessibility. An individual now has an unprecedented amount of information on which to base consumption choices, and the “free” nature of the information provided means that the resulting benefits largely bypass GDP and accrue directly to consumers. This disconnect introduces a wedge between the growth in real GDP and the growth in consumer well-being, with the result that a slower rate of growth of the former does not necessarily imply a slower rate of the latter. The conceptual framework for this analysis is developed in a previous paper (Hulten and Nakamura [2018]), which extended the conventional framework of GDP to include a separate technology for consumer decisions based on Lancaster (1966b) and developed the idea of expanded GDP (or EGDP). In this paper, we use this framework to provide a detailed critique of existing GDP- and price-measurement procedures and summarize the existing evidence on the size of the wedge between GDP and EGDP.

Working Paper 20-10. Charles Hulten, University of Maryland, NBER, and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Leonard I. Nakamura, Federal Reserve Bank of Philadelphia Research Department Emeritus Economist.

Bargaining Shocks and Aggregate Fluctuations

We argue that social and political risk causes significant aggregate fluctuations by changing bargaining power. To that end, we document significant changes in the capital share after large political events, such as political realignments, modifications in collective bargaining rules, or the end of dictatorships, in a sample of developed and emerging economies. These policy changes are associated with significant fluctuations in output. Using a Bayesian proxy-VAR estimated with U.S. data, we show how distribution shocks cause movements in output and unemployment. To quantify the importance of these political shocks for the U.S. as a whole, we extend an otherwise standard neoclassical growth model. We model political shocks as exogenous changes in the bargaining power of workers in a labor market with search and matching. We calibrate the model to the U.S. corporate nonfinancial business sector and we back out the evolution of the bargaining power of workers over time using a new methodological approach, the partial filter. We show how the estimated shocks agree with the historical narrative evidence. We document that bargaining shocks account for 28 percent of aggregate fluctuations and have a welfare cost of 2.4 percent in consumption units.

Supersedes Working Paper 17-25.

Working Paper 20-11. Thorsten Drautzburg, Federal Reserve Bank of Philadelphia Research Department; Jesús Fernández-Villaverde, University of Pennsylvania and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Pablo Guerrón-Quintana, Boston College and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar.

Real Estate Taxes and Home Value: Winners and Losers of TCJA

In this paper, we examine the impact of changes in the federal tax treatment of local property taxes stemming from the implementation of the Tax Cuts and Jobs Act (TCJA) in January 2018 on local housing markets. Using county-level house price information and IRS tax data, we find that capping the federal tax deduction of real estate taxes at \$10,000 has caused the growth rate of home values to decline by an annualized 0.8 percentage point, or 15 percent, in areas where real estate taxes as shares of taxable income exceeded the national median. Additionally, these areas with a high real estate tax burden suffered from reductions in market liquidity after the reform. Fewer houses were transacted either in absolute numbers or as shares of total listings, houses stayed on the market longer before being sold, and more houses were listed with price cuts. Importantly, we find that the housing market slowdown was accompanied by declines in local construction employment growth as well as multifamily building permits. Furthermore, on net more people moved out of these areas after the reform. Finally, we show that the act has already had political consequences. In the 2018 midterm Senate elections, more voters voted for Democratic candidates in areas with high real estate tax burden than for Republican candidates.

Working Paper 20-12. Wenli Li, Federal Reserve Bank of Philadelphia Research Department; Edison G. Yu, Federal Reserve Bank of Philadelphia Research Department.

Piecewise-Linear Approximations and Filtering for DSGE Models with Occasionally Binding Constraints

We develop an algorithm to construct approximate decision rules that are piecewise-linear and continuous for DSGE models with an occasionally binding constraint. The functional form of the decision rules allows us to derive a conditionally optimal particle filter (COPF) for the evaluation of the likelihood function that exploits the structure of the solution. We document the accuracy of the likelihood approximation and embed it into a particle Markov chain Monte Carlo algorithm to conduct Bayesian estimation. Compared with a standard bootstrap particle filter, the COPF significantly reduces the persistence of the Markov chain, improves the accuracy of Monte Carlo approximations of posterior moments, and drastically speeds up computations. We use the techniques to estimate a small-scale DSGE model to assess the effects of the government spending portion of the American Recovery and Reinvestment Act in 2009 when interest rates reached the zero lower bound.

Working Paper 20-13. S. Boraĝan Aruoba, University of Maryland and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Pablo Cuba-Borda, Board of Governors of the Federal Reserve System; Kenji Higa-Flores, University of Maryland; Frank Schorfheide, University of Pennsylvania, CEPR, NBER, PIER, and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Sergio Villalvazo, University of Pennsylvania.

Responding to COVID-19: A Note

We consider several epidemiological simulations of the COVID-19 pandemic using the textbook SIR model and discuss the basic implications of these results for crafting an adequate response to the ensuing economic crisis. Our simulations are meant to be illustrative of the findings reported in the epidemiological literature using more sophisticated models (e.g., Ferguson et al. [2020]). The key observation we stress is that moderating the epidemiological response of social distancing according to the models may come at a steep price of extending the duration of the pandemic and hence the time these measures need to stay in place to be effective. We caution against ignoring this tradeoff as well as the fact that the timeline of the pandemic remains uncertain at this point. Consistent with the prudent advice of hoping for the best but preparing for the worst, we argue that a comprehensive economic response should address the question of how to safely “hibernate” the national economy for a flexible time period. We provide a discussion of basic policy guidelines and highlight the key policy challenges.

Working Paper 20-14. Lukasz A. Drozd, Federal Reserve Bank of Philadelphia Research Department; Marina M. Tavares, International Monetary Fund.

Important Factors Determining Fintech Loan Default: Evidence from the LendingClub Consumer Platform

This study examines key default determinants of fintech loans, using loan-level data from the LendingClub consumer platform during 2007–2018. We identify a robust set of contractual loan characteristics, borrower characteristics, and macroeconomic variables that are important in determining default. We find an important role of alternative data in determining loan default, even after controlling for the obvious risk characteristics and the local economic factors. The results are robust to different empirical approaches. We also find that homeownership and occupation are important factors in determining default. Lenders, however, are required to demonstrate that these factors do not result in any unfair credit decisions. In addition, we find that personal loans used for medical financing or small-business financing are more risky than other personal loans, holding the same characteristics of the borrowers. Government support through various public-private programs could potentially make funding more accessible to those in need of medical services and small businesses without imposing excessive risk to small peer-to-peer (P2P) investors.

Working Paper 20-15. Christophe Croux, EDHEC Business School; Julapa Jagtiani, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Tarunsai Korivi, Amazon.com; Milos Vulanovic, EDHEC Business School.

Effects of Gentrification on Homeowners: Evidence from a Natural Experiment

A major overhaul of the property tax system in 2013 in the city of Philadelphia has generated significant variations in the amount of property taxes across properties. This exogenous policy shock provides a unique opportunity to identify the causal effects of gentrification, which is often accompanied by increased property values, on homeowners' tax payment behavior and residential mobility. The analysis, based on a difference-in-differences framework, suggests that gentrification leads to a higher risk of delinquency on homeowners' tax bills on average, but there was no sign of a large-scale departure of elderly or long-term homeowners in gentrifying neighborhoods within five years after adoption of the new policy. While tax delinquencies were somewhat inflated by appeals for reassessments, programs designed to provide tax relief for long-term homeowners help mitigate the risk of tax delinquencies and displacement. Findings from this study help researchers, policymakers, and practitioners better understand the mechanisms through which gentrification may impact long-term homeowners and the effectiveness of policies to mitigate these tax burdens and displacement.

Working Paper 20-16. Lei Ding, Federal Reserve Bank of Philadelphia Community Development and Regional Outreach; Jackelyn Hwang, Stanford University and Federal Reserve Bank of San Francisco Community Development Visiting Scholar.

Family Job Search and Wealth: The Added Worker Effect Revisited

We propose and estimate a model of family job search and wealth accumulation with data from the Survey of Income and Program Participation (SIPP). This data set reveals a very asymmetric labor market for household members who share that their job finding is stimulated by their partners' job separation. We uncover a job search-theoretic basis for this added worker effect, which occurs mainly during economic downturns, but also by increased nonemployment transfers. Thus, our analysis shows that the policy goal of increasing nonemployment transfers to support a worker's job search is partially offset by the spouse's cross effect of decreased nonemployment and wages. The added worker effect is robust to having more children and more education in the household and does not just result as a composition of heterogeneous individuals. We also show that the interdependency between household members is understated if wealth and savings are not considered. Finally, we show that gender equality in the labor market not only improves women's labor market performance, but it also increases men's accepted wages and nonemployment rates.

Supersedes Working Paper 16-34.

Working Paper 20-17. J. Ignacio García-Pérez, Universidad Pablo de Olavide and FEDEA; Silvio Rendon, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department.

Extended Loan Terms and Auto Loan Default Risk

A salient feature of the \$1.2 trillion auto-loan market is the extension of loan maturity terms in recent years. Using a large, national sample of auto loans from the entire auto market, we find that the default rates on six- and seven-year loans are multiple times that of shorter five-year term loans. Most of the default risk difference is due to borrower risks associated with longer-term loans, as those longer-term auto borrowers are more credit and liquidity constrained. We also find borrowers' loan-term choice to be endogenous and that the endogeneity bias is substantial in conventional default model estimates. To mitigate this risk, we separately estimate instrumental variable regression and simultaneous equation models. Finally, we find evidence of adverse selection in borrowers' loan-term choices in the years when six- and seven-year loans first became widely used, which dissipates over time as lenders adjust to risks in the market.

Working Paper 20-18. Xudong An, Federal Reserve Bank of Philadelphia Supervision, Regulation, and Credit Department; Larry Cordell, Federal Reserve Bank of Philadelphia Risk Assessment, Data Analysis, and Research (RADAR) Group; Sharon Tang, Federal Reserve Bank of Philadelphia.

Central Bank Digital Currency: Central Banking for All?

The introduction of a central bank digital currency (CBDC) allows the central bank to engage in large-scale intermediation by competing with private financial intermediaries for deposits. Yet, since a central bank is not an investment expert, it cannot invest in long-term projects itself, but relies on investment banks to do so. We derive an equivalence result that shows that absent a banking panic, the set of allocations achieved with private financial intermediation will also be achieved with a CBDC. During a panic, however, we show that the rigidity of the central bank's contract with the investment banks has the capacity to deter runs. Thus, the central bank is more stable than the commercial banking sector. Depositors internalize this feature ex ante, and the central bank arises as a deposit monopolist, attracting all deposits away from the commercial banking sector. This monopoly might endanger maturity transformation.

Working Paper 20-19. Jesús Fernández-Villaverde, University of Pennsylvania, NBER, CEPR and Federal Reserve Bank of Philadelphia Research Department Emeritus Economist; Daniel Sanches, Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Linda Schilling, Ecole Polytechnique, CREST, and CEPR; Harald Uhlig, University of Chicago, CEPR, and NBER.

Partisanship and Fiscal Policy in Economic Unions: Evidence from U.S. States

In economic unions the fiscal authority consists not of one, but of many governments. We analyze whether partisanship of state-level politicians affects federal policies, such as fiscal stimulus in the U.S. Using data from close elections, we find partisan differences in the marginal propensity to spend federal transfers: Republican governors spend less. This partisan difference has tended to increase with measures of polarization. We quantify the aggregate effects in a New Keynesian model of Republican and Democratic states in a monetary union: Lowering partisan differences to levels prevailing during less polarized times increases the transfer multiplier by 0.30. The observed changes in the share of Republican governors lead to variation in the multiplier of 0.20 in the model. Local projection methods support this prediction.

Working Paper 20-20. Gerald Carlino, Federal Reserve Bank of Philadelphia Research Department Emeritus Economist; Thorsten Drautzburg, Federal Reserve Bank of Philadelphia Research Department; Robert Inman, The Wharton School of the University of Pennsylvania and Federal Reserve Bank of Philadelphia Research Department Visiting Scholar; Nicholas Zarra, New York University Stern School of Business.