**_SURF Spotlight_: The Third Biennial Conference on Auto Lending[1]**
**2019 Q2**

The Federal Reserve Bank of Philadelphia's Supervisory Research Forum (SURF) and Consumer Finance Institute (CFI), together with the Federal Deposit Insurance Corporation (FDIC), held the Third Biennial Conference on Auto Lending at the Federal Reserve Bank of Philadelphia on June 12-13, 2019.

With more than $1.27 trillion in auto loans outstanding, the auto lending market is strategically important to many financial institutions and to the economy. The intent of the conference was to provide regulators, industry experts, and academics with an opportunity to share insights on trends and risks and on consumer choices in an emerging new landscape for auto lending. There has been increasing interest in addressing such topics from the academic and research community, and the requisite data have become more widely available, contributing to the success of the conference.

The conference agenda included the status of auto credit, consumer demand and decision-making, credit and fraud risks, consumer protection, risk quantification, subprime lending, and auto securitization. The second day featured a supplementary regulatory roundtable. The conference agenda is provided on pages 6–9.

The conference began with an update on the recent status of U.S. consumer credit, and auto lending in particular. The update highlighted the rapid growth in auto lending since 2010, with balances reaching $1.22 trillion in Q4 2018, surpassing credit card debt. Loans to subprime borrowers, although growing fast, are concentrated in finance companies, followed by banks. Loans originated in 2015–2016 are performing worse, and there has since been some credit tightening in response to the increased delinquency from those vintages.

With an estimated $2 billion to $3 billion of fraud losses annually in the auto portfolio, the three types of frauds — first party, synthetic, and third party — are an ongoing concern for lenders as well as for consumers whose credit histories may be impacted. A presenter from FICO examined the problem of fraud and offered ways to combat it using data analytics, strategy, and investigation.

On the consumer protection front, a presenter from the University of Utah showed how laws aimed at protecting consumers may not be as effective as intended, with illustrations from usury laws and wage garnishments. The presenter explained that dealers circumvent usury laws by raising the total cost of the loan, such as by originating larger-sized loans. Borrowers in states that prohibit wage garnishment make higher monthly payments and are more likely to default.

[1] This commentary was written by Paul Calem and Chellappan Ramasamy of the Supervision, Regulation, and Credit Department of the Federal Reserve Bank of Philadelphia. The views expressed here are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

Authors presented four papers that discuss the lengthening term-to-maturity of auto loans, particularly the rising share of loans with maturities exceeding 72 months. One paper examined the dilemma of why borrowers contracting for a longer payment schedule often prepay the loan. A second paper documented the phenomenon of "monthly payment targeting" by borrowers and discussed how this behavior may have contributed to the shift toward longer maturity loans. This paper is featured in a longer discussion included later in this *SURF Spotlight*. The other two papers focused on the topic of what drives consumers to choose a longer term for an auto loan and whether that choice increases default risk.

A later session included two papers that discussed demand for automobiles and auto loans. One paper examined the way in which auto financing affects the availability of Uber rides, illustrating how consumer finance reallocates consumer durables for productive use. The other paper parsed out the components of the 2008 auto market collapse, arguing that income expectations had a major effect on auto buying, dominating competing explanations that include changes in oil prices and declining home values.

The final session on the first day of the conference focused on credit scoring, collateral valuation, and consumer shopping for credit. This session included a discussion on evolving approaches to credit scoring for auto-loan origination decisions. It also included an examination of the extent to which home equity funds are used for auto purchases, which finds the role of home equity to be relatively minor, in contrast to what has been anecdotally reported. A presenter from Cox Automotive Inc. discussed used car market trends and valuation methodology. Two other presenters discussed why two borrowers of similar risk profile or disposition may not be charged the same annual percentage rate (APR), with one examining the role of search frictions and the other exploring statistical tests for race-based discrimination.

The second day of the conference gathered regulators to consider specific supervisory topics, such as auto securitization and subprime lending. Participants were given demonstrations and descriptions of the data and dashboards available to supervisors for portfolio monitoring. The conference concluded with a regulatory roundtable, featuring representatives from the FDIC, the Office of the Comptroller of the Currency, the Consumer Financial Protection Bureau, and the Federal Reserve.

## Spotlighting Research on Payment Targeting

https://www.nber.org/papers/w25668.pdf

"Monthly Payment Targeting and the Demand for Maturity," by Bronson Argyle, Taylor Nadauld, and Christopher Palmer, offers an insightful examination of consumer borrowing decisions (whether to accept an offered auto loan and how much to borrow) in response to quasi-exogenous variation in loan terms (interest rate and term-to-maturity). The study finds that borrowers are much more sensitive to maturity than to interest rate, consistent with borrowers emphasizing monthly payments in deciding on whether and how much to borrow. In particular, borrowers receiving a longer maturity loan increase the amount they borrow by an amount that, on average, keeps the monthly payment unchanged, consistent with "monthly payment targeting" — that is, "budgeting a set amount for monthly car payments."

An additional finding is that the frequency distribution of borrowers' monthly payments bunches at loan amounts just below salient breakpoints, especially at $200, $300, or $400 per month; that is, there is a discrete drop in frequency as these thresholds are exceeded (Figure 1). The authors interpret the "fact that monthly payments anchor at meaningful, salient monthly payment amounts," suggesting that "households follow a loose, mental-accounting approach to the monthly payment they target." Moreover, for both low- and high-income grouping and across various other segmentations of the data, borrowers appear to bunch at these salient payment amounts. The latter findings suggest that liquidity constraints are not the only explanation for monthly payment targeting. "Behavioral frictions" or cognitive biases may play a role as well.

The study is based on unique, detailed, loan-level data on the loan amounts, loan contract terms, and borrower credit attributes of over 4 million auto loans, originated by 319 individual retail lenders (nearly all of which are credit unions). The originated loan data is supplemented with data on loan applications, the applications of over 2 million borrowers from 45 lending institutions. The application data include decisions on loan approvals, denials, and funding outcomes, in addition to the credit attributes of applicants, enabling investigation of loan decisions at the extensive margin (whether or not a borrower accepts an offered loan).

Many lenders in the sample offer a menu of loan contracts such that the terms offered depend on the borrowers' FICO scores in a discontinuous way, whereby interest rates and loan maturities jump discontinuously at various FICO thresholds. Although specific score thresholds differ across institutions, the study locates those that are large, common, and sufficiently isolated (from other discontinuities within each institution's menu of contracts) at FICO scores of 600, 640, and 700 (associated with 173 institutions and 489,993 loans). The study focuses on this subsample and these discontinuities for analyzing the impacts of loan terms on borrowing decisions.

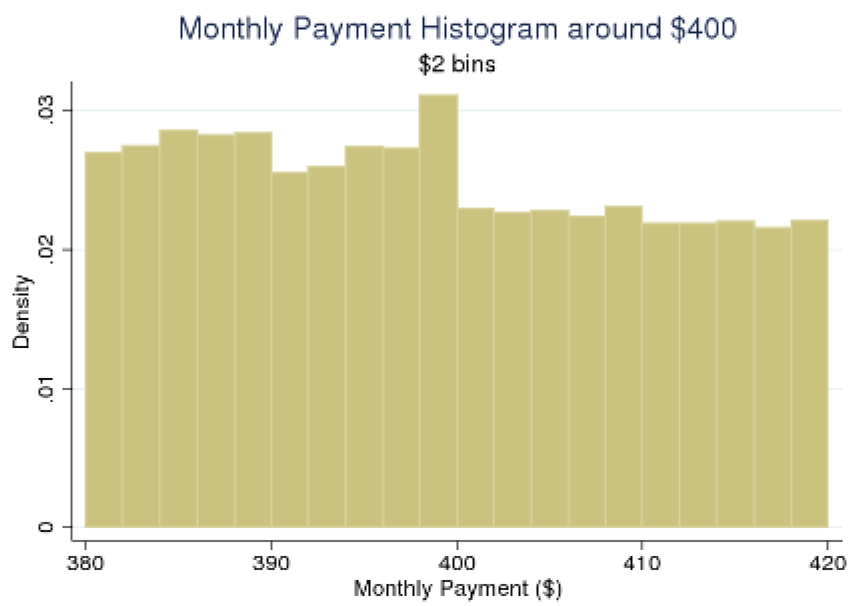
Given that sorting borrowers to either side of each threshold is random within a sufficiently narrow score band around the threshold, the discontinuities yield quasi-exogenous variation in the interest rate and loan maturity offered to otherwise similar borrowers. Evidence is presented that observable characteristics of borrowers vary smoothly across the thresholds, allaying concerns around endogenous sorting.

Moreover, borrower awareness of these credit score thresholds ex ante, and their abilities to adapt their credit scores in response, are likely quite limited, making endogenous selection unlikely. Thus, this sample featuring discontinuous loan contract schedules and ample information on the loan decisions and credit attributes of borrowers provides an excellent laboratory for investigating impacts of loan terms on borrowing outcomes.

The authors point to two interesting and important implications of their empirical findings that have consumer protection and bank supervisory aspects. First, the results help explain the continuous and steep rise in the share of auto loans since 2011, as a consequence of expanded supply and willing borrowers for longer-term loans. Table 1, from a presentation given by an FRB Philadelphia economist on the second day of the Third Biennial Conference on Auto Lending, illustrates this trend (for the population receiving loans with maturities greater than four years). Monthly payment targeting helps explain why borrowers opt for longer-term loans when they are offered, as a means to obtain a more expensive vehicle without increasing their monthly payments. Second, the results may increase concern about deceptive loan origination practices, since consumers who "are fixated on monthly payment amounts when making debt decisions are more susceptible to shrouded marketing."

Lengthening loan terms, especially when tied to monthly payment targeting, raises potential credit risk concerns. Longer-term loans tend to be associated with increased credit risk because, despite the manageable monthly payments, they leave consumers more exposed to future income and liquidity shocks associated with the longer repayment horizons. Moreover, "though automobiles are more durable than they once were, longer-maturity loans make it more likely that consumers will be underwater on their loans, increasing the risk of default on auto loans." Such concerns are heightened to the extent that borrowers are choosing longer loan terms on the basis of monthly payment targeting and related liquidity constraints or cognitive biases, because these may exacerbate longer-term default risks.

**Figure 1: Monthly Payment Histogram around $400 ($2 bins)**




*Source: Argyle, Nadauld, and Palmer presentation at the Third Biennial Conference on Auto Lending*

**Table 1: Term-to-Maturity Distribution by Year-of-Origination**

**Borrowers without a Mortgage**

| Year | 5yr | 6yr | 7yr+ |
|---|---|---|---|
| 2011 | 44% | 41% | 15% |
| 2012 | 40% | 42% | 18% |
| 2013 | 37% | 43% | 20% |
| 2014 | 35% | 44% | 22% |
| 2015 | 32% | 44% | 24% |
| 2016 | 31% | 44% | 25% |
| 2017 | 28% | 43% | 29% |
| 2018 | 29% | 41% | 30% |

**Borrowers with a Mortgage**

| Year | 5yr | 6yr | 7yr+ |
|---|---|---|---|
| 2011 | 46% | 40% | 14% |
| 2012 | 42% | 42% | 17% |
| 2013 | 40% | 42% | 18% |
| 2014 | 37% | 43% | 20% |
| 2015 | 35% | 44% | 22% |
| 2016 | 33% | 43% | 24% |
| 2017 | 30% | 42% | 29% |
| 2018 | 28% | 41% | 31% |

*Source: Calem, Ramasamy, and Wang (2019) presented at the Third Biennial Conference on Auto Lending, using data from Federal Reserve Bank of New York/Equifax Consumer Credit Panel*

Federal Reserve Bank of Philadelphia

# THIRD BIENNIAL CONFERENCE ON AUTO LENDING

JUNE 12–13, 2019

## Wednesday, June 12

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| **8:30 a.m.–9:00 a.m.** | **Breakfast, Registration (Eastburn Court, Boehne Auditorium)** |
| **9:00 a.m.–9:10 a.m.** | **Welcome**<br>Bob Hunt, Federal Reserve Bank of Philadelphia |
| **9:10 a.m.–9:30 a.m.** | **Recent Status of U.S. Consumer Credit and Auto Lending**<br>Joelle Scally, Federal Reserve Bank of New York |
| **9:30 a.m.–10:30 a.m.** | **Consumer Protection**<br>Moderator: Chris Henderson, Federal Reserve Bank of Philadelphia<br>• **Fraud and Cyber/Third Party Management**<br>Elizabeth Lasher, FICO<br>• **Consumer Protection Laws in Auto Lending**<br>Mark Jansen, University of Utah |
| **10:30 a.m.–10:45 a.m.** | **Break** |
| **10:45 a.m.–12:15 p.m.** | **Changes in Term Lengths and Payment Amounts**<br>Moderator: Paul Calem, Federal Reserve Bank of Philadelphia<br>• **One Month Longer and One Month Later? Auto Loan Prepayment and Contractual Terms**<br>Alvaro Mezza, Federal Reserve Board<br>• **Monthly Payment Targeting and the Demand for Maturity**<br>Taylor Nadauld, Brigham Young University<br>• **Liquidity Constraints, Adverse Selection and Risks in Auto Loans**<br>Xudong An, Federal Reserve Bank of Philadelphia |
| **12:15 p.m.–1:30 p.m.** | **Lunch (Eastburn Court, Boehne Auditorium)** |

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| **1:30 p.m.–3:15 p.m.** | **Demand for Autos and Auto Credit** |

Moderator: Larry Santucci, Federal Reserve Bank of Philadelphia

- **Financing the Gig Economy**
  Greg Buchak, University of Chicago
- **How Much Are Car Purchases Driven by Home Equity Withdrawal?**
  Karen Pence, Federal Reserve Board
- **The 2008 U.S. Auto Market Collapse**
  M. Saif Mehkari, University of Richmond

**3:15 p.m.–3:30 p.m.** **Break**

**3:30 p.m.–5:15 p.m.** **Credit Shopping and Decision-Making**

Moderator: Chellappan Ramasamy, Federal Reserve Bank of Philadelphia

- **Credit Score Trends and Credit Score Innovation in Auto Finance**
  Ethan Dornhelm, FICO
- **Real Effects of Search Frictions in Consumer Credit Markets**
  Christopher Palmer, Massachusetts Institute of Technology
- **Manheim Index and Auto Re-Marketing Landscape**
  Zohaib Rahim, Cox Automotive Inc.
- **Testing Models of Economic Discrimination Using the Discretionary Markup of Indirect Auto Loans**
  Jonathan Lanning, Consumer Financial Protection Bureau

**5:15 p.m.–5:20 p.m.** **Conclude** — Chellappan Ramasamy, Federal Reserve Bank of Philadelphia

**5:30 p.m.** **Reception (Eastburn Court, Boehne Auditorium)**

**Thursday, June 13** *Open to Regulators Only*
*Post-Lunch session is restricted to Supervisory Staff Only*

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| **8:30 a.m.–9:00 a.m.** | **Breakfast, Registration (Eastburn Court, Boehne Auditorium)** |
| **9:00 a.m.–9:15 a.m.** | **Welcome**<br>Bill Spaniel, Federal Reserve Bank of Philadelphia |
| **9:15 a.m.–10:30 a.m.** | **Current Topics in Auto Lending**<br><br>Moderator: Brian Capsavage, Federal Deposit Insurance Corporation<br><br>• **Regulatory Update**<br>Stephen Lake, Federal Deposit Insurance Corporation<br><br>• **Longer-Term Auto Lending and Rising Delinquency — A Deep Dive Examination**<br>Paul Calem, Federal Reserve Bank of Philadelphia<br><br>• **Subprime Auto Loan Outcomes by Lender Type**<br>David Low, Consumer Finance Protection Bureau |
| **10:30 a.m.–10:45 a.m.** | **Break** |
| **10:45 a.m.–12:00 noon** | **Auto ABS Market, Credit Conditions for Car Loans**<br><br>Moderator: Yilin Huang, Federal Reserve Bank of Philadelphia<br><br>• **Do Consumer Beliefs about Credit Conditions Predict Car Purchases?**<br>Daniel Vine, Federal Reserve Board<br><br>• **Auto Loans and Leases ABS Update**<br>Woojung Park, Federal Reserve Bank of New York<br><br>• **Strategic Securitization of Lemons: Evidence from Auto ABS**<br>Elizabeth Klee and Chae Hee Shin, Federal Reserve Board |
| **12:00 noon–1:00 p.m.** | **Lunch (Eastburn Court, Boehne Auditorium)** |

**1:00 p.m.–2:15 p.m.** **Risk Quantification (Supervisory Staff Only)**

Moderator: Andrew Kish, Federal Reserve Bank of Philadelphia

- **Near-Term Forecasts**
  Gene Huang, Federal Reserve Bank of Philadelphia
- **Fed: Auto Lending Dashboard for the Large Financial Institutions**
  Anand Krishnan, Federal Reserve Bank of Minneapolis
- **A Look at "Auto Tiny" Dashboard — A Tableau View of Y14-Auto and Auto Count Data**
  PJ Tabit, Federal Reserve Board
- **Used Auto Price Index Dispersion**
  Kenneth Brevoort, Federal Reserve Board

**2:15 p.m.–3:15 p.m.** **Regulatory Roundtable (Supervisory Staff Only)**

Moderator: Jason Keegan, Federal Reserve Bank of Philadelphia

- **Matthew Engelhart**
  Office of the Comptroller of the Currency
- **Stephen Lake**
  Federal Deposit Insurance Corporation
- **Gene Huang**
  Federal Reserve Bank of Philadelphia
- **Chantal Hernandez**
  Consumer Financial Protection Bureau

**3:15 p.m.** **Conclude** — Lauren-Lambie-Hanson, Federal Reserve Bank of Philadelphia

Supervisory Research Forum (SURF)

Consumer Finance Institute

FDIC

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