Summary of the Workshop on Credit Card Lending and Payments

José Canals-Cerdá and Erik Dolson

The Consumer Finance Institute researches how people earn, spend, save, and invest, as well as how credit markets and payment systems affect the economy. Our goal is to foster a healthy consumer sector, a stable financial system, and a resilient regional and national economy.

The Federal Reserve Bank of Philadelphia's Supervisory Research Forum (SURF) and Consumer Finance Institute (CFI) held the virtual Workshop on Credit Card Lending and Payments on September 16–17, 2020. The workshop included sessions on payment systems and financial innovation, the COVID-19 pandemic's impact on consumer finance and credit use, and the industry impact of machine learning and artificial intelligence (ML/AI).

Session 1: Financial Innovation and Payments

Presenters and panelists discussed innovations in payments and consumer adoption and the use of new products, tools, and technologies. The discussion also focused on the role of payments innovations on expanding access and ease of use among consumers and the importance of engagement by companies, regulators, and consumers.

The first keynote speaker was Mark Begor, CEO of Equifax, who discussed the impact of the pandemic on consumers and the importance of looking closely at credit files, as well as alternative data, to gain better insights and implement better credit actions. Begor highlighted the growing importance of data and analytics, particularly in the current environment: More data and analytics create better solutions. He also emphasized the importance of reaching out to consumers who are currently nonscorable by credit data to build a more inclusive economy.

COVID-19 has changed every consumer's world, and building multiple data assets is critical in this environment. Prior to the COVID-19 pandemic, lenders could be confident making decisions on 65 percent of the population — that number has decreased to about 30 percent during the crisis. Lenders cannot identify these consumers accurately using traditional lending data alone. Credit reports remain a strong indicator of credit history, but the COVID-19 pandemic brings the power of alternative data into even sharper focus.

Begor described Equifax's efforts to extrapolate past natural disaster experiences to inform the expectations of consumer performance during the COVID-19 crisis. Using this information, he indicated that the current trajectory for consumer delinquencies is expected to peak at a rate 23 percent higher than at the beginning of the year. He also indicated that best practices in credit decisioning call for the use of a layered approach that starts with the traditional credit file and extends available insights using AI and alternative data. Income and employment information represent critical alternative data, given the increase in unemployment experienced in past months. Alternative data collected with the consent of the consumer, like utility payment data, are particularly useful for accounts with thin credit files, and bank transactions provide a clearer picture of creditworthiness. More data provide smarter insights and allow for smarter actions.

The papers session included Financial Innovation, Payment Choice, and Cash Demand — Causal Evidence from the Staggered Introduction of Contactless Debit Cards by Martin Brown, professor of Banking, University of St.Gallen; This Is What's in Your Wallet ... and Here's How You Use It by Scott Schuh, associate professor, West Virginia

University; and Making Connections: Adoption of Mobile P2P Payments and Financial Inclusion by Ellen Merry, principal economist, Board of Governors of the Federal Reserve System.

The panel discussion titled Innovations and Opportunities in Payments and Credit Card Lending was moderated by Jackie Nugent, assistant vice president, Federal Reserve Bank of Kansas City. Panelists included James Kim, Fintech and Payments Team lead, Ballard Spahr LLP; Amy Friend, senior advisor, FS Vector; and Charles Walton, senior vice president – Digital Identity, Mastercard. This panel concluded the first session of the day.

Session 2: Industry Impact of the COVID-19 Pandemic

The impacts, both human and economic, of the COVID-19 pandemic are undeniable. The second session focused on the importance of the industry impact of COVID-19. Experts discussed their work delving into those impacts, the possible long-term changes to the payments ecosystem, and possible paths to recovery.

The second keynote address of the day by Wayne Best, chief economist at Visa Inc., providing an economic and market update focused on the impact of the COVID-19 pandemic. Visa is able to use real-time transaction data to gain insights about economic performance. Best highlighted the huge drop in credit card spending during the crisis, along with a decline in delinquencies and charge-offs. He noted a reduction in cash usage with almost one-third of customers between the ages of 35 and 54 engaging in 0 cash transactions in July 2020. He also discussed recent changes in consumer behavior with a dramatic shift toward ecommerce and online/mobile ordering, indicating that ecommerce has seen 10 years of growth in just three months. Consumers who indicate the highest level of concern about the COVID-19 pandemic are changing their behavior the most, with older consumers beginning to embrace the online channel as well. Consumer spending is recovering more quickly for low-income households because of a lower percentage of discretionary spending.

The focus of the afternoon paper session was on COVID-19's impact on consumer finance and credit use. During the first paper session, all three presenters highlighted the substantial impact of the federal government's relief efforts on cushioning the blow of the economic crisis on households, particularly those that are low income. Michaela Pagel, Roderick H. Cushman Associate Professor of Business, Columbia Business School, analyzed the impact of the Coronavirus Aid, Relief, and Economic Security (CARES) Act on consumption using transaction-level data on linked bank accounts from a nonprofit fintech company. The analysis points out that the multiplier effect of the stimulus is subdued as a result of shutdowns in certain economic sectors. The overall effect is heterogeneous, with some consumers substantially increasing their payments of rents, mortgages, and credit card debt.

Benjamin Kay, senior economist from the Federal Reserve Board, presented his research on the impact of COVID-19 on consumer credit using credit card data. He finds that in counties severely impacted by the pandemic, prime credit card customers reduced their use of credit, while less creditworthy consumers increased their outstanding balances. Fiona Greig, director of Consumer Research, JPMorgan Chase Institute, presented data on changes in income and spending since the onset of the crisis, showing a large drop in spending shortly after the initial shutdowns to contain

the virus; however, spending recovered quickly, especially among low-income households. She noted that the change in income (year-over-year) for low-income households has actually been positive.

The final session of Day 1 was a panel focused on the impact of COVID-19 on credit card lending and payments, moderated by Thomas Akana, senior research fellow, Federal Reserve Bank of Philadelphia. Panelists included Amy Crews Cutts, president and chief economist, AC Cutts & Associates LLC; Cristian deRitis, deputy chief economist, Moody's Analytics; Moshe Orenbuch, managing director, Credit Suisse; and Herman Ramirez, U.S. Consumer Payment Panel manager, Visa. Panelists highlighted the difficult situation for lenders in the current crisis, with an increase in uncertainty around credit reports and with significant increases in forbearances. Panelists agreed that the crisis has resulted in a sharp reduction in new account originations, although lenders are working to keep existing customers by maintaining, or improving, rewards programs and minimizing credit line cuts.

Session 3: Industry ML/AI Adoption

The credit card lending and payments industry has historically been at the forefront of technology adoption. Advances in ML/AI across traditional business functions including origination, account management, payments, fraud, collections, and risk, generating new challenges and novel opportunities. Day 2 of the conference focused on the industry impact of ML and AI. The invited keynote speaker was Charles Elkan, managing director and global head of machine learning at Goldman Sachs. His presentation highlighted lessons learned by his team at Goldman Sachs, as well as in his previous job at Amazon, around machine learning and finance. Elkan gave a brief historical introduction to the evolution of ML and presented best practices for incorporating ML/AI into existing business workflows.

The final paper session of the conference consisted of three presentations that addressed a broad range of topics relevant to ML/AI. The papers included "The Resilience of Responsible AI" by Scott Zoldi, chief analytics officer, FICO; "A Survey of Machine Learning in Credit Risk" by Joseph L. Breeden, chief executive officer, Prescient Models LLC; and "Algorithmic Accountability" by Adair Morse, associate professor of finance, Haas School of Business, University of California, Berkeley.

The final panel session of the day focused on the importance of interpretability and explainability for algorithmic model decisions, highlighting the need for credit decision and scoring models to be easily explainable to consumers but also as accurate as more black-box models. The panel moderated by Simon Freyaldenhoven, machine learning economist at the Federal Reserve Bank of Philadelphia, included a diverse group of practitioners from industry and academia. Cinthia Rudin is a professor from Duke University and a leading scholar in the area of interpretable ML; Morse conducts work on the interaction between algorithms and the law, with a focus on discrimination; Amit Gandhi is a leading scholar on econometrics and consumer behavior and a former chief economist at Microsoft Cloud; Nitin Sharma is a senior research scientist at PayPal and a leading practitioner in ML/AI, with a special interest in fraud detection as well as reinforcement learning and adversarial learning.

The first topic that the panel tackled was discrimination in the space of ML/AI. The first question posed by the moderator was whether we need to regulate the outcome or the input of ML/AI models. Morse indicated that the relevant law in this area is the Civil Rights Act of 1964, which is explicitly "input based," but challenges remain about how to interpret it. Rudin indicated that in her research she has been able to develop interpretable ML/AI models even for the most complex applications, such as computer vision, although she indicated that it can be challenging. To illustrate this point, she shared some slides describing her recent work on interpretable ML/AI in a credit score application with data from home equity lines of credit. Using sophisticated ML techniques, she built a scoring model that provided rule-based explanations for specific score outcomes. Interpretability is especially useful when a human has to make the final decision, or to gain an understanding of the interworkings of the model on specific outcomes, or when troubleshooting the model is required. In her view, we need to stop thinking about models primarily in terms of accuracy. Instead, we need to start thinking about interpretability as a tool to help improve models and databases. In addition, interpretability may be particularly useful, for example, to help with our understanding of model outliers.

Simon questioned Rudin about the differences between fairness constraints and interpretability constraints. Rudin indicated that, in her experience, both types of constraints are usually very different. She also said that interpretability constraints do not usually impact accuracy, while fairness constraints may have an impact on model accuracy. Finally, she also indicated that interpretability is domain dependent; for example, the expectations of interpretability in the field of credit scoring will be very different from interpretability in computer vision and may be tailored to specific audiences, such as customers, business clients, or regulators.

Ghandi contributed to the discussion by highlighting the relationship between interpretability and explainability and of low-stakes versus high-stakes decisions. He pointed out that these concepts are particularly important for stakeholders who find themselves in a position of explaining potential model shortcomings or failures in high-stake scenarios. He also brought into the conversation the important topic of domain expertise, which is also important when considering interpretability and explainability. Domain expertise can also be important for improving accuracy in models.

The panel discussion also addressed audience questions related to market power and ML/AI, and the possible future of more human ML/AI capable of simulating empathy when interacting with humans. Improvements in models will continue; there is a large space of data that remains untapped. A major challenge in ML/AI is the problem combinatorial search over different paths that may imperfectly represent the data-generating process; improvements in this area are a key to the future. Morse highlighted the important goal of empowering ML to build a fairer society. Sharman highlighted that the academic research in ML/AI is evolving in a very empirical manner, and this creates challenges of reproducibility and applicability of results for industry practitioners.

With more than $800 billion in unsecured balances in the U.S., the credit card market is strategically important for the economy and consumer and financial institutions, with a significant concentration of credit card portfolios in large banks. Along with this, rapid innovation in payment systems and services has led to an increasing interest in this area among policymakers and regulators. The intent of the workshop was to provide regulators, industry experts, and

academics with an opportunity to share insights on trends and risks in credit cards and payment services, particularly in light of the COVID-19 pandemic, the ensuing economic downturn, and the hastened shift toward contactless payments.

This summary offered highlights of keynote speakers, academic paper presentations, and discussion panels. More information on all of these sessions is available on the conference agenda page, which includes links to session recordings and presentation materials.