

# The Use of Cash-Flow Data in Underwriting Credit

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*Small Business Spotlight*

## About FinRegLab

FinRegLab is a non-profit research organization that was founded on the premise that independent, rigorous research is a primary ingredient in helping develop market norms and policy solutions that enable responsible innovation in financial services.

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# CONTENTS

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- 1. Executive Summary .....2**
- 2. Background: Small Business Credit Needs and Challenges ..... 4**
  - 2.1 Challenges in accessing and underwriting credit..... 5
  - 2.2 Particular challenges for underserved populations.....9
  - 2.3 The potential benefits of cash-flow data..... 11
  - 2.4 FinRegLab’s research ..... 13
- 3. Synthesis of Empirical Research ..... 14**
  - 3.1 Research participants and underwriting processes ..... 15
  - 3.2 Overview of results ..... 16
- 4. Market Survey: The Use of Cash-Flow Data Today ..... 19**
  - 4.1 The spread of cash-flow based underwriting ..... 19
  - 4.2 Growth of a new data sharing architecture.....22
- 5. Policy Analysis: The Use of Cash-Flow Data Tomorrow.....24**
  - 5.1 Public research to inform further market development .....24
  - 5.2 Inclusion and fair lending effects ..... 27
  - 5.3 Consistency with broader notions of fairness, transparency, and privacy ..... 29
  - 5.4 Data ecosystem concerns .....32
  - 5.5 Technology adoption and cost concerns ..... 33
- 6. Conclusion..... 35**
- Bibliography .....36**

# 1. EXECUTIVE SUMMARY

Small businesses are a vital part of the U.S. economy, yet they often struggle to access the credit they need. A variety of factors make them relatively difficult and expensive to underwrite compared to both consumers and larger companies. Over the last decade, an increasing range of non-bank technology firms and traditional lenders have begun leveraging new data sources in an effort to reduce costs and improve accuracy in underwriting, particularly for smaller loans to smaller companies.

Electronic cash-flow information—such as companies' bank account records, feeds from accounting software, and transaction information from e-commerce platforms and payment processors—is at the core of these efforts. This data provides many of the same kinds of information that traditional lenders have always relied upon, but obtaining it in electronic form facilitates faster, more sophisticated, and more consistent analysis through automated underwriting systems. Reliance on such data has already helped to shrink processing times, but it appears also to have substantial promise for improving the ability to predict loan performance and expanding access to credit for both small businesses generally and for underserved populations in particular.

In light of this potential, FinRegLab set out to conduct empirical and policy analyses of the potential benefits and risks of cash-flow based underwriting and the hurdles to its wider adoption in both small business and consumer credit markets. FinRegLab is a non-profit research organization that was founded in 2018 based on the premise that independent, rigorous research is a primary ingredient in helping develop market norms and policy solutions that enable responsible innovation in financial services. This report, along with two companion documents, is our first effort to provide such research and begin a conversation on themes that we expect to recur in our subsequent work.

In particular, this Small Business Spotlight provides an overview of our applied research based on data from six non-bank financial services providers—Accion, Brigit, Kabbage, LendUp, Oportun, and Petal—that have begun using cash-flow variables and scores in a bid to increase the provision of credit to populations of consumers and small businesses who may have difficulty obtaining loans from traditional sources. FinRegLab retained Charles River Associates to help us design and conduct an independent analysis of the participants' cash-flow variables and scores relative to actual loan performance for purposes of assessing general predictiveness, inclusion, and fair lending risk in connection with credit eligibility determinations.

This report also provides a broader picture of cash-flow based underwriting in the small business market and an overview of policy issues that may be particularly important in determining the pace of expansion going forward. This work builds on individual stakeholder interviews, as well as

three working groups that FinRegLab convened to solicit insight and opinion about the use of cash-flow data in credit underwriting generally from more than 80 representatives of fintech companies, banks, data aggregators, advocacy organizations, and research institutions.

As discussed in more detail below, our research suggests that reliance on electronic sources of cash-flow data for purposes of credit underwriting is growing more rapidly in small business markets than in consumer credit. More specifically:

- » **Expanding use:** Due in part to the fact that cash-flow analyses have always been a part of traditional commercial underwriting, reliance on new sources of cash-flow data appears to be viewed as a relatively intuitive evolution in underwriting practices. A range of traditional lenders and new entrants have begun to use such information (either on their own initiative or in partnership with each other) to facilitate faster, less expensive application processing and more detailed automated analyses of small business inflows and outflows.
- » **Empirical research:** FinRegLab's empirical research of cash-flow variables and scores used by the two small business and four consumer study participants indicates that cash-flow data can be valuable to predict loan performance in general and for particular subpopulations. Standing alone, the cash-flow metrics generally performed as well as traditional credit scores, which suggests that cash-flow variables and scores can provide meaningful predictive power among populations and products similar to those studied where traditional credit history is not available or reliable. In addition, our analysis suggests that the cash-flow data and traditional credit data provided different insights into credit risk, such that the cash-flow data frequently improved the ability to predict credit risk among borrowers that are scored by traditional systems as presenting similar risks of default. We also found that the degree to which the cash-flow data was predictive of credit risk appeared to be relatively consistent across borrowers who likely belong to different demographic groups.
- » **Policy issues:** While these results are encouraging, stakeholders identified several issues that may affect the nature and pace of further growth going forward. Such issues include technology and cost hurdles for small banks, data security and privacy considerations, and increasing investors' and regulators' confidence in the reliability of the data.

Our Empirical Research Findings report, which was released in July 2019, provides a more detailed discussion of our methodology and research findings. Our Market Context & Policy Analysis report, which is forthcoming in fall 2019, provides deeper policy analyses of the current state of cash-flow based underwriting in the United States across both consumer and small business markets. It focuses both on the adoption of cash-flow data in underwriting and the evolution of a new ecosystem to support transfers of such data between companies for credit and other purposes, with an eye to identifying challenges and risks in the emerging markets and options for developing and extending practices that benefit both consumers and small businesses.

Across the three documents, we conclude that cash-flow data holds substantial promise for improving credit risk prediction, expanding access to credit, and spurring market innovation and competition. While the scope of our research and data do not permit us to answer all relevant questions, the reports suggest that stakeholders should invest more resources into reducing the technological, competitive, and compliance challenges that are slowing adoption of beneficial practices and mitigation of risks in today's markets. With thoughtful development, cash-flow based underwriting has the potential to become a win-win for borrowers and financial services providers alike.

## 2. BACKGROUND

### *Small Business Credit Needs and Challenges*

Access to credit can make the difference between success and failure for many small businesses, yet underwriting such companies poses special challenges relative to either consumer lending or commercial loans to larger firms. Businesses owned by minorities, recent immigrants, and women are even more credit-constrained. In the wake of the 2008 financial crisis, both traditional lenders and new entrants have begun searching for new data sources to improve the predictiveness of underwriting models, cut costs, and reduce processing times.

Small businesses are the cornerstone of the U.S. economy, creating two out of every three net new jobs in the U.S. in the past fifteen years.<sup>1</sup> While definitions vary, more than 99 percent of U.S. businesses meet what is perhaps the most common definition, which focuses on firms with fewer than 500 employees.<sup>2</sup> Of the 30 million businesses under that threshold, 24 million are sole proprietorships or other “nonemployer” businesses. These include both full-time and part-time entrepreneurs, including independent contractors in the “gig economy.” The remaining 6 million “employer” businesses have at least one employee and include local retail businesses, suppliers that sell to larger corporations, and high-growth startups.<sup>3</sup> Overall, small businesses employ half of the private sector workforce across such industries as health care, food service, retail, manufacturing, transportation, and logistics.<sup>4</sup>

Yet while the small business sector is tremendously vital and diverse, it is also tremendously volatile. Though survival rates vary somewhat by industry, over the last quarter century approximately

<sup>1</sup> U.S. Small Business Administration Office of Advocacy, *Frequently Asked Questions about Small Business 1* (2018); Consumer Financial Protection Bureau, *Key Dimensions of the Small Business Lending Landscape 10-11* (2017) (hereinafter CFPB Small Business Lending Landscape).

<sup>2</sup> U.S. Small Business Administration Office of Advocacy, *United States Small Business Profile 1* (2019). The 500-employee definition is used by the Census Bureau, Bureau of Labor Statistics, Federal Reserve, and Small Business Administration, though the SBA also has more tailored thresholds for individual industries based generally on revenue or employment. Those thresholds can be found here: [www.sba.gov/document/support-table-size-standards](http://www.sba.gov/document/support-table-size-standards). Definitions of what constitutes a small business loan also vary, although commercial loans under \$1 million are often assumed to be extended to small businesses. For further discussion of the varying thresholds used in different small business and lending research, see CFPB Small Business Lending Landscape at 5-10, 28-36.

<sup>3</sup> U.S. Small Business Administration Office of Advocacy (2019) at 4; Karen G. Mills, *Fintech, Small Business and the American Dream*, Chapter 2 [eBook] (2019).

<sup>4</sup> U.S. Small Business Administration Office of Advocacy (2019) at 1, 3.

50 percent of businesses started in the United States have closed or failed in their first five years.<sup>5</sup> Annual failure rates for companies with less than 10 employees are at least four times as high as for companies with 100 to 499 employees.<sup>6</sup> This volatility is both a symptom of and a contributing factor to the special credit challenges faced by small businesses.

## 2.1 Challenges in accessing and underwriting credit

Access to credit can be critical to the survival and financial health of small businesses for two primary reasons. First, because small businesses often operate with limited reserves, credit can be critical for smoothing gaps between inflows and outflows. Research suggests that the median small business holds only enough cash reserves to continue operations for 2 to 4 weeks, meaning that delays in receiving revenue can create tremendous financial strain absent access to operating capital.<sup>7</sup> Roughly 40 percent of applications from employer businesses are at least in part for this purpose.<sup>8</sup> Second, since owners often invest substantial personal resources into their businesses, they may need access to credit to support further expansion, such as purchasing equipment, leasing new locations, and hiring additional employees.<sup>9</sup> Surveys indicate that almost 60 percent of employer firms' applications are at least in part for purposes of expansion or to seek new opportunities.<sup>10</sup>

Yet underwriting small businesses is particularly challenging compared to other credit markets, for several reasons:

- » **Heightened risk:** Because small businesses are so diverse across so many types of industries, business models, and local market conditions, predicting success or failure is quite challenging. With an approximate 50 percent survival rate in the first five years, startups are particularly risky.<sup>11</sup> And even with more established businesses, some research suggests that small businesses tend to be more vulnerable to economic downturns than larger companies.<sup>12</sup>

<sup>5</sup> Although there was some variation in connection with the 2008 financial crisis, survival rates have otherwise remained relatively consistent since 1995. See U.S. Small Business Administration Office of Advocacy, *Small Business Facts: Do Economic or Industry Factors Affect Business Survival?* (2012); U.S. Small Business Administration Office of Advocacy (2018) at 2.

<sup>6</sup> Board of Governors of the Federal Reserve System, *Report to the Congress on the Availability of Credit to Small Businesses* 16 table 2 (2017) (reporting failure rates in 2009 of 11 percent for companies under 10 employees and 2.2 percent for companies between 100 and 499 employees, compared with 8.9 and 2.2 percent, respectively, in 2014) (hereinafter FRB Small Business Report).

<sup>7</sup> Diana Farrell & Chris Wheat, *Cash Is King: Flows, Balances, and Buffer Days: Evidence from 600,000 Small Businesses*, JPMorgan Chase & Co. Institute 14 (2016) (reporting a median of 27 cash buffer days based on data from February to October 2015); Diana Farrell et al., *Growth, Vitality, and Cash Flows: High-Frequency Evidence from 1 Million Small Businesses*, JPMorgan Chase & Co. Institute 25 n.14, 31, 44 (2018) (reporting a median of 12 cash buffer days based on 2016 data); Diana Farrell et al., *Facing Uncertainty: Small Business Cash Flow Patterns in 25 U.S. Cities*, JPMorgan Chase & Co. Institute (2019) (analyzing cash-flow management challenges among samples of small businesses from 2013-2017); Mills, Chapter 3 (discussing substantial impact of federal government program to ensure that invoices were paid in 15 rather than 30 days).

<sup>8</sup> Federal Reserve Banks, *2018 Small Business Credit Survey: Report on Employer Firms* 10 (2019) (hereinafter Federal Reserve Banks 2018 Employer Survey).

<sup>9</sup> CFPB *Small Business Lending Landscape* at 17; Carol O'Connell, *Funding for Small Businesses: How Much Working Capital is Needed to Grow Your Small Business?*, Excelsior Growth Fund (Aug. 26, 2018); Meredith Wood, *5 Reasons Your Business Needs a Loan*, Weebly (Apr. 20, 2015).

<sup>10</sup> Federal Reserve Banks *2018 Employer Survey* at 10. Applications may have more than one purpose; for example, in 2018, in addition to the percentage of respondents seeking loans for operating capital or expansion, 27 percent of employer respondents listed refinancing, 20 percent listed replacing capital assets or making repairs, and 5 percent reported "other." *Id.* Nonemployer firms report similar reasons for applying for credit. Federal Reserve Bank of New York, *2018 Small Business Credit Survey: Report on Nonemployer Firms* 10 (2019) (62 percent for expansion/new opportunity, 42 percent for meeting operating expenses, 27 percent refinancing, 16 percent replacing capital assets or making repairs, 3 percent other) (hereinafter Federal Reserve Banks 2018 Nonemployer Survey).

<sup>11</sup> U.S. Small Business Administration Office of Advocacy (2012); U.S. Small Business Administration Office of Advocacy (2018) at 2.

<sup>12</sup> Mark Gertler & Simon Gilchrist, *Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms*, 109 *Quarterly Journal of Economics* no. 2 (May 1994); Aysegul Sahin et al., *Why Small Businesses Were Hit Harder by the Recent Recession*, Federal Reserve Bank of New York *Current Issues in Economics and Finance* (4th Issue 2011); Board of Governors of the Federal Reserve System, *Report to the Congress on the Availability of Credit to Small Businesses* 16 table 2 (2017).



» **Information shortfalls:** Whereas consumer lending has moved toward automated underwriting of relatively standardized inputs over the last several decades, the heterogeneity of small businesses and lack of consistent data have made this process slower and more difficult for small business lending. Analyzing whether an applicant has both the *financial capacity* to repay a loan and the *willingness* to do so is more complicated for a small business loan than a consumer loan, since the process depends on forecasting the future health of the business as well as evaluating past financial habits of the company and/or its ownership/management. Business credit reports can help inform both questions since they may reflect both current obligations and payment history, but they do not provide a complete picture and they are not typically available for new businesses. Many lenders use the personal scores of business owners/managers as a rough substitute for gauging willingness to repay, but the predictiveness of such information was called into question after the financial crisis.

Small businesses are also more opaque than large businesses with regard to the information they can typically provide to lenders. Where larger, more mature businesses have more sophisticated accounting systems and a longer history, lenders historically have had to devote substantial time to collecting information from diverse and often non-digitized sources to develop a detailed picture of small businesses' operations. Such information typically has included the three financial statements (income statement, balance sheet, and statement of cash flows), revenue projections, tax returns, bank statements, and credit history to the extent that it is available. Traditional lenders—particularly community banks—have also tended to rely heavily on face-to-face meetings, detailed business plans, counselling, community contacts, and knowledge of local market conditions, based on the cumulative knowledge of their employees rather than third-party sources. Such underwriting approaches, which involve subjective evaluations as well as analysis of objective information, are often called judgmental or manual underwriting.<sup>13</sup>

» **Higher underwriting costs:** In part because of the breadth of information collected and analyzed from disparate sources, small business underwriting is relatively expensive, time consuming, and complicated compared to consumer lending. Moreover, these underwriting costs do not scale alongside loan amount. Underwriting a small commercial loan—for example, for \$100,000—costs a lender nearly as much as underwriting a \$1 million loan, but offers far smaller returns.<sup>14</sup> Thus, although there is a strong demand for relatively small loans of less than \$250,000 particularly among smaller, younger businesses, the fixed costs of commercial underwriting are easier to defray with larger loans. And when those loans are made to larger, older companies, they are generally less likely to fail.<sup>15</sup>

<sup>13</sup> In the small business context, many stakeholders also use the terms “relationship” lending versus “transactional” lending to contrast companies that tend to rely heavily on “soft” information about both the local community and the particular small business with those that rely primarily on “hard” information that can be quantified and analyzed through automated systems. While small banks are more likely to be relationship lenders than large banks, most traditional lending institutions fall along a spectrum. For instance, surveys suggest that the majority of both small and large banks use most quantifiable information that is readily available to them to evaluate creditworthiness, although for instance large banks are more likely to rely on both personal and commercial credit scores while small banks may rely more on debt-to-income and other ratios. Both large and small banks also cite the existence of previous loan and/or deposit relationships as the most common reasons to make exceptions to small business loan policies. Federal Deposit Insurance Corporation, 2018 FDIC Small Business Lending Survey 6, 40–43 (2018).

<sup>14</sup> Donna Fuscaldo, *Small Businesses Are the Next Wave of Fintech Focus*, *Forbes* (Feb. 12, 2019); Charles Wendel, *Making Small Business Loans Profitably*, *Bank Administration Institute* (July 7, 2015).

<sup>15</sup> Mills, Chapter 4; Yulia Gnatyuk, *Blog, Small Business Lending: The Profit Puzzle Facing Commercial Banks*, *MonJa* (Jan. 10, 2019). For similar reasons, costs are often also higher for lenders in monitoring credit arrangements with small business borrowers after origination. FRB Small Business Report at 17.



### BOX 2.1.1 CREDIT BUREAUS AND SCORING SYSTEMS

Local credit bureaus first emerged in the United States in the late 1800s to support merchant lenders who extended credit to businesses and individuals. The bureaus helped lenders evaluate credit risk by collecting and disseminating lists of borrowers who had not repaid prior obligations as agreed.

The consumer reporting system underwent a period of tremendous transformation in the 1970s and 1980s due to a number of factors, including rapid growth in so-called third-party credit scoring models by companies such as Fair Isaac Corporation (FICO). Such models use historical data from credit reports or other sources to group applicants into bands reflecting their predicted likelihood of default.

Today, reliance on third-party scores that are calculated based on consumer reports provided by the three “nationwide” consumer reporting agencies—Equifax, Experian, and TransUnion—is widespread. Many consumer lenders use the scores and reports as inputs into their internal underwriting analyses. And because third-party scores facilitate consistent comparisons, they may also be used to monitor portfolios, expedite securitization, and provide investment benchmarks even when they are not used in the underwriting process itself.

The commercial credit reporting system, which includes companies such as Dun & Bradstreet, Equifax, and Experian, also dates back to the 1800s. However, third-party credit scoring systems started to develop substantially later in the small business lending market than in consumer lending. At the time of the financial crisis in 2008, commercial credit scores were derived primarily from the owners’ personal credit scores with limited additional business information added in, and

many traditional lenders chose to rely on owners’ personal credit scores instead. Concerns about the predictiveness of available data and heavy losses prompted some large lenders to restrict their activities after the crisis, for instance by increasing their minimum loan amounts.

In the decade since the crisis, the commercial credit reporting industry has moved toward more standardized records of businesses’ payments to vendors, equipment purchases, and creditors, similar to the kind of “trade line” information that is common in consumer reports. Nevertheless, the algorithms for business credit scores are not as standardized as for consumer scores, and business scores are more frequently available for established small businesses than for startups.

A 2018 survey of nearly 5000 employer firms found that 86 percent relied in whole or in part on their owners’ personal scores to obtain financing, with only 14 percent relying solely on business scores. Reliance on personal scores is even stronger among nonemployer firms.

**Sources:** Consumer Financial Protection Bureau, Key Dimensions and Processes in the U.S. Credit Reporting System: A Review of How the Nation’s Largest Credit Bureaus Manage Consumer Data 3 (2012) (hereinafter CFPB Credit Reporting System); Allen N. Berger & W. Scott Frame, Small Business Credit Scoring and Credit Availability, 47 *J. of Small Business Management* 5 (2007); Allen N. Berger et al., The Surprising Use of Credit Scoring in Small Business Lending by Community Banks and the Attendant Effects on Credit Availability, Risk, and Profitability, *J. of Financial Services Research* 1-17 (Issues 1-2, 2011); Mills, Chapters 4, 6; Peter Carroll & Ben Hoffman, Financing Small Businesses: How ‘New-Form Lending’ Will Reshape Banks’ Small Business Strategies, *Oliver Wyman* 3 (2013); Claire Tsosie & Steve Nicastro, Business Credit Score 101, *nerdwallet* (Oct. 6, 2017); Federal Reserve Banks 2018 Employer Survey at 9; Federal Reserve Banks, 2017 Small Business Credit Survey Report on Nonemployer Firms 9 (2018).

In light of these challenges, many traditional lenders will not provide business loans to companies that fall below certain sales and/or maturity thresholds.<sup>16</sup> To the extent that startups do not have sufficient equity reserves to operate in the interim period, many owners rely on consumer credit sources such as personal credit cards or home equity lines of credit.<sup>17</sup> But such products are not specifically designed for business use and in some cases may be more expensive than traditional business loans. Moreover, many entrepreneurs may find that their personal credit scores suffer

<sup>16</sup> See, e.g., John Rampton, 5 Main Reasons Banks Turn Down Small-Business Owners for Loans, *Entrepreneur* (Dec. 20, 2016) (noting that traditional lenders often require two full years of tax returns).

<sup>17</sup> Board of Governors of the Federal Reserve System, Report to the Congress on the Use of Credit Cards by Small Businesses and the Credit Card Market for Small Businesses 1-2 (2010) (reporting that 41 percent of businesses with less than 50 employees reported using personal credit cards as of 2009); Federal Reserve Bank of New York, 2016 Small Business Credit Survey Report on Startup Firms 14 (2017) (reporting that applications for personal loans and cash advances were highest among firms under 5 years of age with medium to high credit risk); Federal Reserve Banks, 2017 Small Business Credit Survey: Report on Nonemployer Firms 9 (2018) (reporting that 65 percent of firms without employees relied in whole or in part on personal credit cards); Scott Shane, The Micro Business Home Equity Loan Crunch, *Small Business Trends* (Jan. 20, 2016) (compiling sources suggesting that about half of micro business owners with homes and lines of credit made use of home equity for business purposes, even though such borrowing has become more difficult since the financial crisis).

**BOX 2.1.2 TRADITIONAL SMALL BUSINESS LENDING SOURCES**

Small businesses traditionally looked locally for sources of credit, primarily to their local banks and credit unions. From the 1970s through the early 1990s, distances between borrowers and lenders gradually increased, and then began to spread more rapidly as credit scoring allowed big banks to compete increasingly for small business loans. By the late 1990s, getting a standard commercial loan from local banks began to lose its place as the dominant choice for small businesses seeking credit.

After the financial crisis, the very largest banks curtailed their small business lending activities more severely than other traditional lenders and were slower to increase their activity even after the economy recovered. One tracker indicates that their approval rates reached a post-crisis high of 27.7 percent in July 2019. Even after substantial loss in market share, community banks tend to have higher approval rates (at 50.1 percent as of July 2019) and a larger percentage of small business loans relative to their share of total bank assets than larger banks. Credit unions also have

higher approval rates than the very largest banks (at 40 percent), though their approvals have been stagnant or falling.

The U.S. Small Business Administration is also an important source of traditional funding for small business credit. It does not loan directly, but rather provides partial federal guarantees for a wide range of loan types. SBA loans are originated primarily by banks, but also by online platforms and community organizations. SBA loans have relatively low costs and flexible repayment terms, but they can take weeks or months to originate.

**Sources:** Mills, Chapter 4; U.S. Small Business Administration, Quick Overview of SBA Loan Guaranty Programs (2017); Jared Hecht, What Is an SBA Loan and How Do You Get One? *Forbes* (Jan. 3, 2018); Rohit Arora, Small Business Loan Approvals at Banks Hit Record Highs, *Forbes* (Aug. 7, 2019); Robert DeYoung et al., The Information Revolution and Small Business Lending: The Missing Evidence, *J. of Financial Services Research* 19-33 (Issues 1-2, 2011); Julapa Jagtiani & Catharine Lemieux, Small Business Lending After the Financial Crisis: A New Competitive Landscape for Community Banks, *Federal Reserve Bank of Chicago Economic Perspectives* (3rd Issue 2016).

while their companies are in start-up phases. This can cause hangover effects for companies (and their owners) even after the first few years of operation.<sup>18</sup>

Further, the challenges involved in small business lending have prompted traditional lenders to prioritize other, more profitable business lines over time. This trend started in the late 1990s, but was dramatically illustrated in the aftermath of the 2008 financial crisis.<sup>19</sup> Large banks, which had pushed the farthest toward automated underwriting of small business loans by relying on owners' personal credit scores and other relatively standardized inputs, moved back toward judgmental underwriting and increased their lending thresholds in ways that effectively excluded smaller applicants.<sup>20</sup> Overall, loan origination for the four biggest U.S. banks dropped by 50 percent after the crisis and still had not recovered fully by the middle of the decade.<sup>21</sup> Lending by community banks,

<sup>18</sup> Ellen Chang, Don't Do This: Business Empires Built on Credit Cards, *The Street* (Jan. 24, 2018); Marc Prosser, Can Bad Credit Business Borrowers Be a Good Investment?, *Forbes* (Dec. 9, 2015). One study comparing 50,000 small business owners' personal credit reports with their business credit reports from 2001 to 2004 found that signs of financial problems were more likely to appear first on the owners' personal credit reports than on their business reports where businesses had four or fewer employees and/or were less than three years in age; for older and larger small businesses, signs of financial problems were more likely to appear on the business credit reports first. The report authors could not determine whether the pattern for smaller, younger businesses was driven by intermingling of owners' personal and business finances or because owners prioritized their business finances ahead of personal impacts. Experian, *Predicting Risk: The Relationship Between Business and Consumer Scores* 7-9 (2006). Even after businesses are old enough and large enough to qualify more easily for business credit products, lenders frequently require owners to provide their personal credit history as part of the underwriting process. Accordingly, damage to personal scores can have lingering effects for both owners and businesses. Chang; Prosser.

<sup>19</sup> Mills, Chapters 3-4; Ann Marie Wiersch & Scott Shane, Why Small Business Lending Isn't What It Used to Be, *Federal Reserve Bank of Cleveland Economic Commentary*, figure 2 (Aug. 14, 2013); Rebel A. Cole, How Did the Financial Crisis Affect Small Business Lending in the United States?, *U.S. Small Business Administration Office of Advocacy* 23-39 (2012).

<sup>20</sup> For example, banks have set minimum loan amounts or minimum revenue thresholds for applicants. Below such thresholds, they may refer applicants to their small business credit card products, which tend to involve higher interest rates. Mills, Chapter 4; Cole (2012) at 23-39; Brian S. Chen et al., The Decline of Big-Bank Lending to Small Business: Dynamic Impacts on Local Credit and Labor Markets, *National Bureau of Economic Research Working Paper No. 23843* (updated September 2017); U.S. Government Accountability Office, *Community Banks: Effect of Regulations on Small Business Lending and Institutions Appears Modest, but Lending Data Could Be Improved* (2018).

<sup>21</sup> Chen et al., at 1. For the largest ten banks, 2014 lending volumes were down 38 percent from their 2006 peak. Total volume of small business loans held by all banks as of September 2015 was down 16 percent from its peak in 2008, although loans above a \$1 million threshold had increased 37 percent during the same time period. Ruth Simon, Big Banks Cut Back on Loans to Small Businesses, *Wall St. J.* (Nov. 26, 2015).

which have long had a disproportionate share of the small business market, also declined in the face of bank failures, consolidation, and other factors.<sup>22</sup>

## 2.2 Particular challenges for underserved populations

While demand for credit has long exceeded supply among small businesses in general, businesses owned by racial minorities, recent immigrants, and women face particular challenges in accessing credit.<sup>23</sup> Historical discrimination in employment, education, housing, and lending have produced substantial disparities in income and assets among demographic groups,<sup>24</sup> which in turn can impact owners' access to start-up equity funding and personal payment histories.<sup>25</sup> Racial minorities and recent immigrants are less likely to have sufficient credit history to generate personal credit scores, and the credit scores of minorities, recent immigrants, and women are lower on average than comparator demographic groups.<sup>26</sup> In addition, despite technological advancements, legal restrictions often substantially complicate the movement of data across borders to assist immigrants in drawing on their credit histories (however extensive) in their prior countries of residence.<sup>27</sup>

Thus, small businesses owned by racial minorities, immigrants, and women may tend to have greater need for access to credit, but also have more difficulty in obtaining it.<sup>28</sup> For example, small businesses operated or owned by minorities and women tend to be younger and smaller than other firms, which may make it more difficult for them to obtain credit.<sup>29</sup> Studies show women and

**22** Roisin McCord et al., Explaining the Decline in the Number of Banks Since the Great Recession, Federal Reserve Bank of Richmond Economic Brief 15-03 (March 2015); Federal Deposit Insurance Corporation, FDIC Community Banking Study, Community Banking Initiative (2012); William Dunkelberg & Jonathan Scott, Community Banks and Small Business Lending, Conference of State Bank Supervisors (2019); Matt D'Angelo, When Community Banks Die: How Small Businesses Are Affected, Business News Daily (Oct. 19, 2018). For a discussion of these and other sources of small business financing, see CFPB Small Business Lending Landscape at 19-36.

**23** See generally Carolyn Schulman, The Partnership for Lending in Underserved Markets (PLUM): Increasing Minority Entrepreneurs' Access to Capital, Milken Institute (2018); James Barth et al., Minority-Owned Depository Institutions: A Market Overview, Milken Institute (2018); Fundbox, What If: Designing Fair & Equal Access for Women (2018); U.S. Department of Commerce Economics and Statistics Administration, Women-Owned Businesses in the 21st Century (2010); Wonhyung Lee & Stephanie Black, Small Business Development: Immigrants' Access to Loan Capital, J. of Small Business & Entrepreneurship 193 (2017). For a discussion of how minority- and women-owned businesses are defined in various research, see CFPB Small Business Lending Landscape at 12-16.

**24** Laura Sullivan et al., The Racial Wealth Gap: Why Policy Matters, Institute for Assets & Social Policy, Brandeis University Institute for Assets & Social Policy & Demos (2015); Robert Fairlie et al., Black and White: Access to Capital Among Minority-Owned Startups, Stanford Institute for Economic Policy Research Discussion Paper No. 17-03 (Dec. 15, 2016); Stephen J. Rose & Heidi I. Hartmann, Still a Man's Labor Market: The Slowly Narrowing Gender Wage Gap, Institute for Women's Policy Research (2018); Carmen Diana Deere & Cheryl R. Doss, The Gender Asset Gap: What Do We Know and Why Does It Matter?, Feminist Economics 1 (January/April 2006).

**25** For example, 2016 surveys found that African-American, Hispanic, and women-owned firms were more likely than other demographic groups to be denied credit based on lack of collateral, credit scores, and credit history. Federal Reserve Bank of Cleveland, 2016 Small Business Credit Survey Report on Minority-Owned Firms 15, 21 (2017) (hereinafter Federal Reserve Banks 2016 Minority-Owned Firms Survey); Federal Reserve Banks of New York & Kansas City, 2016 Small Business Credit Survey Report on Women-Owned Firms 25 (2017) (hereinafter Federal Reserve Banks 2016 Women-Owned Firms Survey). See also Nathan Grawe, Wealth and Economic Mobility, Urban Institute (2008); Kate Bahn et al., A Progressive Agenda for Inclusive and Diverse Entrepreneurship, Center for American Progress (2016).

**26** Board of Governors of the Federal Reserve System, Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit (2007) (hereinafter FRB Credit Scoring Report); Robert B. Avery, Kenneth P. Brevoort, & Glenn Canner, Does Credit Scoring Produce a Disparate Impact? 40 Real Estate Economics 965 (2012); Consumer Financial Protection Bureau, Data Point: Credit Invisibles (2015); Geng Li, Gender-Related Differences in Credit Use and Credit Scores, FEDS Notes (June 22, 2018). For analyses of commercial credit scores see Rebel A. Cole, Credit Scores and Credit Market Outcomes: Evidence from the Survey of Small Business Finances and the Kauffman Firm Survey, U.S. Small Business Administration Office of Advocacy (2014); U.S. Small Business Administration Office of Advocacy, Issue Brief, Access to Capital for Women- and Minority-Owned Businesses: Revisiting Key Variables (2014); Fairlie et al.

**27** Yoni Blumberg, Stanford Grads Raise \$20 Million for a Company that Aims to Make Life Cheaper and Easier for Immigrants, CNBC (Dec. 5, 2018); Nigel Corey, Cross-Border Data Flows: Where Are the Barriers, and What Do They Cost?, Information Technology & Innovation Foundation (2017); Kayt Sukel, Tips for Immigrants Building a U.S. Credit History, Creditcards.com (Feb. 14, 2008).

**28** Federal Reserve Banks 2016 Minority-Owned Firms Survey at 8-9, 13-14; Federal Reserve Banks 2016 Women-Owned Firms Survey at 16-17, 22-25.

**29** Federal Reserve Banks 2016 Minority-Owned Firms Survey at 1-2; Federal Reserve Banks 2016 Women-Owned Firms Survey at 1-2; FRB Small Business Report at 19-25; Usman Ahmed et al., Filling the Gap: How Technology Enables Access to Finance for Small- and Medium-Sized Enterprises, Innovations: Technology, Governance, Globalization (Summer-Fall 2015); Farrell & Wheat at 37.

minority business owners are less likely to apply for business loans because of fear of denial, and may tend to rely relatively heavily on credit cards or personal credit compared to other businesses.<sup>30</sup> And while the Small Business Administration has traditionally supported minority-owned companies, these businesses struggled to secure SBA loans for several years after the 2008 financial crisis.<sup>31</sup>

Geographic access to lenders can also be a barrier. Proximity to bank branches in rural and lower-income urban neighborhoods has always been lower than other areas, and further worsened after the financial crisis due to a wave of closures. For example, nearly 10 percent of bank branches closed in the U.S. between 2008 and 2017, with 18 percent of closures in rural “banking deserts.”<sup>32</sup> Research on the impacts of community bank closings indicates that negative impacts on small business lending are often concentrated in low-income and high-minority neighborhoods, where lender-specific relationships may be difficult to replace.<sup>33</sup> More generally, research suggests that loans often perform better when borrowers are located closer to the lenders.<sup>34</sup>

At the same time, heavy reliance on relationships and judgmental underwriting may have drawbacks for minority, immigrant, and women business owners. For instance, they may be disadvantaged if their business networks are not as robust as those of other applicants,<sup>35</sup> and because subjective decision-making creates space for possible biases to influence the lending evaluation process.<sup>36</sup>

Whatever the specific causes for individual applicants or underserved groups as a whole, the disparities are substantial. Recent annual surveys indicate that the denial rate for women-owned firms that applied for credit is about 5 percentage points higher than for men-owned firms across all loan types, but that the gap for traditional business loans is almost 15 percentage points. In addition, average loan size for female entrepreneurs is nearly one third smaller, and the percent of female entrepreneurs who did not apply because they believed they would be turned down was 22 percent, compared to 15 percent of male entrepreneurs.<sup>37</sup> Among small businesses owned by racial minorities, denial rates are roughly 10 percentage points higher than for non-minority owned firms overall, but the gap for traditional business loans and lines of credit is closer to 20 percentage points. The percent of minority entrepreneurs that did not apply for credit because they believed they would be turned down varied by group, ranging from 38 percent of African-American owned firms to approximately 20 percent for Asian and Hispanic-owned firms and 14 percent of

**30** Alicia Robb, *Access to Capital Among Young Firms, Minority-Owned Firms, Women-Owned Firms, and High-Tech Firms*, U.S. Small Business Administration (2013); Naranchimeg Mijid, *Why Are Female Small Business Owners in the United States Less Likely to Apply for Bank Loans Than Their Male Counterparts?*, 27 *J. of Small Business & Entrepreneurship* 229 (2015); Fairlie et al., at 23-25, 29-30; Barth et al., at 2, 4-5; Federal Reserve Banks 2016 *Minority-Owned Firms Survey* at 10-11, 20; Federal Reserve Banks 2016 *Women-Owned Firms Survey* at 15, 19-20.

**31** Ruth Simon & Tom McGinty, *Loan Rebound Misses Black Businesses: Fewer SBA-Backed Loans Go to Black Borrowers*, *Wall St. J.* (Mar. 14, 2014) (reporting for example that SBA outstanding loan volume to African-American borrowers declined from 8.2 percent in 2008 to 1.7 percent in 2014); Derek Hyra & Meghan Doughty, *SBA Lending: Equity and Efficiency Challenges*, *American University School of Public Affairs Metropolitan Policy Center* (2014).

**32** National Community Reinvestment Coalition, *Banking Deserts in America: An Overview of Bank Branch Closures from 2008 through 2007 and Their Impact*. NCRC Research (2017); National Low Income Housing Coalition, *Bank Closures Since Great Recession Impact Access to Financial Services* (2019).

**33** Hoai-Luu Q. Nguyen, *Are Credit Markets Still Local? Evidence from Bank Branch Closures*, 11 *American Economic Journal: Applied Economics* (January 2019) (finding declines in small business lending for several years that persist even after the entry of new banks).

**34** Robert DeYoung et al., *Borrower-Lender Distance, Credit Scoring, and Loan Performance: Evidence from Informational-Opaque Small Business Borrowers*, 17 *J. of Fin. Intermediation* 113-143 (2008).

**35** Brian Uzzi, *Embeddedness in the Making of Financial Capital: How Social Relations and Networks Benefit Firms Seeking Financing*, 64 *Am. Sociological Rev.* 481 (1999); Patrick Saporito et al., *Bank-Firm Relationships: Do Perceptions Vary by Gender?*, 37 *Entrepreneurship: Theory and Practice* 837 (2013).

**36** FRB *Credit Scoring Report* at O-7, 3-4, 10-11, 36-37, 51; Fairlie et al., at 26-29. For a study finding disparities in treatment between testers from different demographic groups posing as loan applicants, see Sterling A. Bone et al., *Shaping Small Business Lending Policy Through Matched-Pair Mystery Shopping*, 38 *J. of Public Policy & Marketing* 391 (2019).

**37** Federal Reserve Banks 2016 *Women-Owned Firms Survey* at 14, 22; Rohit Arora, *The Lending Gap Narrows for Women Business Owners, But It's Still 31% Less Than for Men*, *CNBC* (Mar. 7, 2019).



white-owned firms. While much of the difference in denial rates and discouragement levels can be explained by differences in credit scores and other risk factors, one analysis finds that black-owned firms are about 5 percent less likely to be approved for financing and about 8 percent more likely to not apply for financing because they expect they would not be approved than are white-owned firms even after controlling for credit risk, firm size, industry, and certain other factors.<sup>38</sup>

## 2.3 The potential benefits of cash-flow data

In light of both general concerns about the availability of credit to small businesses and about access for underserved populations specifically, growing numbers of market observers over the last 15 years have focused on the potential for “alternative” or “non-traditional” data sources to fill gaps and weaknesses in traditional underwriting processes. These efforts further intensified after the 2008 financial crisis caused greater soul-searching about traditional lenders’ ability to predict credit risk accurately among small businesses. Some alternative data initiatives in the consumer space have been led by traditional credit bureaus,<sup>39</sup> but as the Internet and other technology advances have dramatically expanded the availability of digital information more generally, lenders and new types of information intermediaries have also begun to consider a wide variety of other electronic data that could potentially be accessed for underwriting purposes without flowing through traditional credit information channels.

As the focus on alternative data sources has intensified, small businesses’ cash-flow data has attracted substantial interest, particularly when it can be accessed electronically from deposit accounts, business accounting software, or accounts with payment processors or e-commerce

### BOX 2.3.1 WHAT IS ALTERNATIVE OR NON-TRADITIONAL DATA?

Alternative and non-traditional data are broad umbrella terms that are often used to refer to any information that is not contained in traditional credit reports and/or credit applications (such as annual income). For example, the terms are sometimes used to refer to cash-flow data, although particularly in the small business credit market cash-flow statements and bank statements have frequently been required by traditional lenders.

Depending on the context, the terms may also be used to refer to items such as payment history information from specific individual sources such as landlords and utility companies that historically have not tended

to report full payments history to large nationwide credit bureaus, information from a broad range of public records, on-line footprint and e-commerce information, and items such as a person’s education or employment.

Some forms of alternative data are focused primarily on behavioral patterns that are relatively remote from the kinds of financial information that lenders have traditionally used to assess applicants’ ability and propensity to repay. Those data are beyond the scope of FinRegLab’s analysis of cash-flow information.

**Sources:** Experian, *Alternative Credit Data 5* (2018); TransUnion, *The State of Alternative Data 3* (2015).

**38** Federal Reserve Banks 2016 Minority-Owned Firms Survey at 9, 13-14; Alicia Robb et al., *Mind the Gap: How Do Credit Market Experiences and Borrowing Patterns Differ for Minority-Owned Firms*, Federal Reserve Bank of Atlanta Community & Economic Development Discussion Paper No. 03-18, 21-25 (September 2018). A 2018 survey of nonemployer firms found somewhat smaller disparities in discouragement rates, ranging from 27 percent for African-American owned firms to 11 percent for white-owned firms. Federal Reserve Banks 2018 Non-employer Survey at 11, 14-15.

**39** For example, Experian has launched a product called Experian Boost that augments consumers’ traditional credit files where consumers give permission to access their transaction account data to obtain payments history for utility and telecommunications information. FICO, Experian, and data aggregator Fincity have also announced a joint venture called UltraFICO that will create adjusted credit scores where consumers authorize accessing their account data to analyze for factors such as the length of time that accounts have been open, recency and frequency of bank transactions, evidence of consistent cash on hand, and history of positive account balances. Matt Tatham, *Blog, More Than 1 Million Americans Have Completed Experian Boost*, [experian.com](http://experian.com) (Aug. 13, 2019); FICO, *Ultra-FICO Score*, [www.fico.com/en/products/ultrafico-score](http://www.fico.com/en/products/ultrafico-score).

platforms. In some sense, such data is not really “alternative” at all, since traditional lenders have historically required cash-flow statements and bank statements to help gauge and forecast income, expenses, reserves, and payment history. Yet in other ways, regularized electronic access to such information and the development of automated credit underwriting models based on cash-flow variables are potentially revolutionary. Interviews with stakeholders suggest that there are several aspects of electronic cash-flow data that make it particularly valuable for evaluating credit risk among applicants in the small business context:

- » **Sensitivity and timeliness:** The first is that, particularly when it is derived from bank accounts or from accounting software, electronic cash-flow data can provide a more detailed and timely view of the businesses’ overall finances than traditional credit reports and scores or annualized financial statements. Traditional credit reports typically only reflect payment history for selected types of expenses; bank account and accounting software data, in contrast, can provide a detailed accounting of inflows, outflows, and cushions on an ongoing basis. Even for well-established small businesses, stakeholders report that a detailed snapshot of the applicants’ recent financial operations is often more valuable than payments history from several years before. Moreover, where owners have relied on consumer credit to help launch their businesses previously, their personal scores may have declined as their businesses have struggled in previous periods. Accordingly, overreliance on past payment history could cause lenders to miss signs that a business has turned the corner and is now ready for expansion.
- » **Availability:** The second important attribute of cash-flow data is that it is available even for companies that haven’t had a chance to build credit histories. Business checking accounts are substantially cheaper and easier to obtain than credit accounts.<sup>40</sup> Small businesses’ reliance on accounting software, e-commerce platforms, and payment card processors has also increased over the last decade, generating new types of electronic data that can be used in cash-flow analyses.<sup>41</sup>
- » **Specialization:** The third feature that makes electronic cash-flow data particularly useful is that it can help lenders build expertise and tailored credit risk models with regard to particular types or sizes of businesses. For example, a food truck owner in Northern California may find it hard to prove her viability to a local bank with no lending history to mobile food servicers, but an online lender with years of data from Atlanta, Dallas, and Omaha may be better able to predict when a loan to purchase new equipment is warranted.<sup>42</sup>

Using automated underwriting systems to process such data offers important benefits as well, since computer algorithms can account consistently for the interaction of many factors simultaneously, for instance in offsetting shortfalls or weaknesses in one area with strengths in other areas.<sup>43</sup> A range of techniques is available for such analyses, though differences in statistical and analytic

<sup>40</sup> See generally U.S. Small Business Administration, Business Guide: Launch Your Business: Open a Business Bank Account (undated).

<sup>41</sup> For example, a survey of 5,000 small to medium sized businesses found that 80 percent reported using business accounting software as of 2017. Viewpost, Viewpost SMB Emerging Trends in Accounting Report 2017 (Mar. 21, 2017), available at [www.viewpost.com/blog/viewpost-smb-emerging-trends-accounting-report-2017/](http://www.viewpost.com/blog/viewpost-smb-emerging-trends-accounting-report-2017/). The percentage of small businesses accepting debit and credit cards has also been rising. National Federation of Independent Businesses Research Foundation, National Small Business Poll: Payment Arrangements 1, 4-5, 11-12 (2016) (reporting that 65 percent of employer business respondents reported that they accepted credit and/or debit cards); National Federation of Independent Business Research Foundation, National Small Business Poll: Credit Cards 1, 8 (2008) (reporting that 49 percent of employer business respondents reported that they accepted credit and/or debit cards).

<sup>42</sup> Federal Trade Commission, Strictly Business: An FTC Forum on Small Business Financing (May 8, 2019).

<sup>43</sup> See FRB Credit Scoring Report at 10-11.

approaches are beyond the scope of this project.<sup>44</sup> Although prior attempts to move toward highly automated underwriting in small business lending were not entirely successful as described above, stakeholders note the potential to reduce processing costs and times in addition to improving the predictiveness of underwriting models more generally. Thus, as discussed further in Section 4 below, as various market developments have made it increasingly easy for lenders to access electronic account data even where they themselves do not provide account services to small businesses, it is little surprise that a growing range of market stakeholders is taking notice.

## 2.4 FinRegLab's research

This background informed FinRegLab's decision to focus its first major research and policy analysis project on the adoption of cash-flow based underwriting in both consumer and small business credit markets. Specifically, we organized two initiatives to support the broader project. In the first, we retained Charles River Associates (CRA) to help us design and conduct an independent analysis of the predictiveness of cash-flow variables and scores based on actual loan performance. The second was to convene a broad range of stakeholders to develop a more fulsome picture of the challenges that are shaping both the adoption of cash-flow based underwriting and the data-sharing ecosystem that facilitates the underlying transfers of cash-flow information between companies. In addition to convening three policy working groups with more than 80 stakeholders, we also conducted additional one-on-one interviews to deepen our understanding of particular issues, including the particular challenges in small business lending markets.

Our goal across both workstreams was to use cash-flow based underwriting as a stepping stone to broader questions about how customer-directed data sharing can be structured to promote customer data sovereignty and protect privacy, while preserving space for firms to use that data to create financial products and services that better serve the public.

This report is intended to work in tandem with our two other cash-flow publications by providing a more focused discussion of the use of cash-flow data in small business credit markets specifically. Section 3 provides a synthesis of the empirical research, though readers are encouraged to read our Empirical Research Findings report issued in July 2019 for a deeper understanding of the methodology, findings, and implications. Section 4 provides additional information about the current market context, building on conversations with a broader range of market actors. Finally, Section 5 provides an overview of potential market and policy implications for small business lending in particular, though readers are encouraged to read the forthcoming Market Context & Policy Analysis report for additional analyses of various issues.

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<sup>44</sup> Traditional credit scoring models and other automated underwriting systems have generally relied upon statistical techniques such as logistic regressions to assess variables' ability to predict default. In recent years, some lender and model developers have begun to experiment with a variety of other computerized analytical methods that are frequently described as involving machine learning or artificial intelligence. See generally Trevor Dryer, *How Machine Learning Is Quietly Transforming Small Business Lending*, *Forbes* (Nov. 1, 2018).



### 3. SYNTHESIS OF EMPIRICAL RESEARCH

As discussed in more detail in the Empirical Research Findings report, FinRegLab's purpose in undertaking this applied research was to conduct an independent, quantitative analysis of cash-flow scores and variables that are being used in the market today to underwrite consumers and small businesses.

With assistance from Charles River Associates, we defined three specific research questions for consideration:

- » Are cash-flow variables and scores useful in predicting credit risk in the underwriting process, as compared with traditional credit scores and/or credit bureau attributes?
- » Do cash-flow variables and scores expand the availability of credit, particularly with respect to consumers and small business owners who may have experienced constrained access to credit under more traditional underwriting criteria?
- » What, if any, risks of creating a disparate impact among different demographic groups appear to arise from the use of cash-flow variables and scores in highly automated underwriting processes?

We structured this research to focus on evaluating the predictiveness of the particular cash-flow scores and metrics supplied by the study participants. The participants did not provide us with the underlying bank account or other records or the algorithms by which they generate cash-flow scores and metrics, make credit eligibility determinations, or determine prices. They commonly use additional information and attributes in their automated underwriting processes beyond the cash-flow metrics that were the focus of our analysis, and they did not provide the weights assigned by their algorithms to each cash-flow attribute. Thus, the participants' cash-flow metrics permitted CRA and FinRegLab to evaluate the general predictiveness and fair lending effects of the variables and scores in general, but our analysis does not evaluate their particular proprietary models.

The diversity of the participants and data prevented combining the data to perform a consolidated analysis. Accordingly, the Empirical Research Findings report provides separate summaries of the results for each participant. However, given each participant's interest in protecting proprietary information, we agreed to anonymize the firms in the findings and present the research results in a way that does not identify individual participants or individual cash-flow variables. In addition, the results for participants who are focused on small business markets are not separately identified from those who focus on consumer populations. Finally, discussion of certain aspects of the participants' lending processes is provided only at a group level.

### 3.1 Research participants and underwriting processes

The six participants provided data concerning their use of cash-flow variables and/or scores in underwriting unsecured, relatively short-term credit products.<sup>45</sup> The research participants are heterogeneous with respect to a wide range of factors, including business models, geographic footprint, operational structure, product offerings, application channels, tenure in specific markets, and overall lending volumes. They also take different approaches to acquiring and using cash-flow data. Two serve small businesses, while four focus on consumer lending. The participants include five for-profit firms and two Community Development Financial Institutions (CDFIs).<sup>46</sup> All of the credit products are unsecured, but the products vary as to closed-end and open-end structures and as to whether they are issued by the participants or by partner banks. Other terms also vary significantly. For example, repayment periods vary from the borrower's next account deposit to 46 months. Fee and rate structures also vary depending on the product type and in some cases the amount borrowed and other factors relating to borrowers' credit characteristics. Several of the participants are nationally based, while others are highly concentrated in selected geographies.

With regard to the two small business participants specifically:

- » **Kabbage:** Kabbage provides small businesses with access to unsecured lines of credit between \$2,000 and \$250,000 through its technology service provider relationship with Celtic Bank, an FDIC-insured industrial bank chartered in Utah. Celtic Bank requires one year of operating history and, on average, revenues of \$50,000 annually or \$4,200 monthly for the last three months to qualify. Average credit lines are \$25,000 and average draws are \$6,000; draws are treated as installment loans with terms of 6, 12 or 18 months. All business loans available through Kabbage are issued by Celtic Bank. Applications are accepted online.
- » **Accion in the U.S.:** Accion in the U.S. (Accion) is a non-profit small business lender that provides installment loans of \$300 or more to underserved entrepreneurs. Repayment periods are typically 24 months. Accion provides small businesses loans nationwide through four independent, regional CDFIs and a national office that coordinates technology and knowledge sharing to benefit the network. Data from one location was evaluated in this research. Accion accepts applications online.

All participants use highly automated underwriting systems. From available cash-flow sources, they distill financial variables reflecting applicants' income, expenses, balances, and activity levels. In the small business context, for example, the participants use cash-flow data to assess the business's historical and projected performance. The data includes incoming revenue, receivables, expenditures, and business obligations. The firm's financial performance may also be evaluated based on such metrics as average monthly revenue and transaction volume.

Although the consumer participants evaluate cash-flow data for periods up to twelve months, the small business participants sometimes consider longer periods depending on the data source and availability. Some participants pull data over time, for instance to monitor whether adjustments in the terms for open-end credit products are warranted.<sup>47</sup>

<sup>45</sup> Some of the participating companies provide access to credit by partnering with or acting as service providers to financial institutions that extend loans or other credit products, but do not consider themselves to be lenders and do not themselves extend credit.

<sup>46</sup> CDFIs are certified by the Community Development Financial Institutions Fund within the U.S. Department of the Treasury based on a mission of serving low-income communities, and are eligible for various types of CDFI Fund assistance and programs. CDFI Fund, CDFI Certification: Your Gateway to the CDFI Community (2016).

<sup>47</sup> We did not have access to any information regarding data that was pulled after the participants' original decisions in connection with later monitoring or decisionmaking.

Across one or more participants, sources of cash-flow data included transaction account data from banks, business accounting software, payments processors, and e-commerce platforms, as well as copies of pay stubs, invoices, bill statements and similar materials provided by applicants. The latter is part of a broader underwriting process that may allow some participants to extend credit to customers who may lack access to bank accounts and thus do not have digital cash-flow data. The participants generally use one or more data aggregators, which are discussed further in section 4.2, to access bank account data.

All of the participants use the cash-flow data to create proprietary assessments of repayment risk, but they vary as to the stage at which they use that information, the weight that they assign it in evaluating ability and/or propensity to repay, and the extent to which they rely upon traditional scores or attributes in sequence or in combination with cash-flow variables. The participants also vary as to their use of traditional credit bureau attributes and scores. Most participants will grant credit to applicants who do not have traditional credit scores, though they may factor traditional scores and attributes into their underwriting processes where available. The small business participants differ as to how they approach use of business credit scores and/or the personal scores of business owners.

## 3.2 Overview of results

As further detailed in the Empirical Research Findings report, our analysis found encouraging results with regard to all three of the research questions. More specifically:

**Predictiveness:** We found compelling evidence that indicates that among the sample populations and products, cash-flow variables and scores are predictive of credit risk and loan performance across the highly heterogeneous set of research participants. In separate analyses of the five participants that provided loan-level data, the results appear to be robust across both consumer and small business populations as well as across the credit spectrum, including among borrowers with no or very low traditional credit scores. The cash-flow metrics were both predictive in their own right and also frequently improved the ability to predict credit risk in combination with traditional credit scores or other metrics.

Two implications of the results are particularly important. First, the overall strength of the results and the nature of the participating companies' underwriting practices suggest that cash-flow variables and scores can provide meaningful predictive power among populations and products similar to those studied where traditional credit history is not available or reliable. Second, the fact that cash-flow attributes and scores frequently improved predictiveness in combination with traditional credit history is noteworthy. The improvement in predictiveness for combined models and our other analyses suggest that cash-flow information separates risk in somewhat different ways than traditional metrics. Overall, the results suggest that with regard to populations and products similar to those studied, cash-flow data can provide meaningful insights by differentiating predictions of credit risk among borrowers that are scored by traditional systems as presenting similar risks of default.

**Inclusion:** We found evidence that the study participants are serving borrowers who may have historically faced constraints on their ability to access credit, although data limitations did not permit a consistent quantitative analysis to be applied across all participants. We used a variety of benchmarks depending on what data was available, including the percentage of borrowers with low or no traditional credit scores, borrower income levels, and residence in zip codes in which racial minorities exceed 50 percent or 80 percent of the total population. For example, we were able to study the percentage of borrowers who had no or low traditional credit scores for three of the participants. This group is likely to include relatively high numbers of borrowers who have such limited

credit history on file with nationwide consumer reporting agencies that they cannot be scored using third-party models, as well as borrowers who may be having some difficulty accessing credit after past periods of financial instability. The percentage of the three participants' borrowers with traditional scores below approximately 650 was roughly 45 percent to 50 percent and the percentage of their borrowers below approximately 600 ranged from 0 to 25 percent. In addition, two participants reported that attempts to pull traditional scores for 3.5 percent and 8 percent of their borrowers were unsuccessful, respectively.<sup>48</sup>

**Fair lending effects:** Finally, for four of the participants where data was available for analysis, we evaluated potential disparate impact risks in using the cash-flow variables and scores in underwriting algorithms.<sup>49</sup> We found that the degree to which the cash-flow data was predictive of credit risk appeared to be relatively consistent across borrowers who likely belong to different

### BOX 3.2.1 FAIR LENDING ANALYSIS

The Equal Credit Opportunity Act (ECOA) prohibits discrimination in “any aspect of a credit transaction” for both consumer and commercial credit on the basis of race, color, national origin, religion, sex, marital status, age, or certain other protected characteristics. ECOA has two principal theories of liability. The first is “disparate treatment,” in which creditors treat applicants differently based on protected characteristics. The second is “disparate impact,” in which use of facially neutral practices has a disproportionately negative effect on members of a protected class, unless those practices are meeting a legitimate business need that cannot reasonably be achieved by less impactful means.

Many observers note that one of the advantages of the shift from judgmental underwriting toward automated systems is that such methodologies tend to decrease the risk of disparate treatment. Such underwriting models are generally prohibited from factoring in protected characteristics, and because they apply algorithms to standardized credit information, a given set of inputs produces the same outputs each time. Yet automated systems can pose disparate impact risk in particular circumstances, for instance where they have been developed using biased sources of data or rely on variables that closely proxy for protected status without providing substantial independent predictive value.

Litigation and enforcement actions involving disparate impact claims against lenders generally follow

a three-step process that has been developed in the employment discrimination context:

- » At the first step, a plaintiff must make an initial showing that the particular practice causes a disproportionate adverse effect on protected groups.
- » If that showing is made, the burden shifts to the creditor to show that the practice furthers a legitimate business need.
- » In the third stage, the burden shifts to the plaintiff to demonstrate whether the legitimate business need can reasonably be achieved by using an alternative practice that would have less adverse impact on protected classes.

Statistical tests can be important at each stage of litigation or enforcement, and more generally when lenders set out to evaluate their degree of fair lending compliance risk with regard to adopting or changing their underwriting models.

**Sources:** 15 U.S.C. 1691(a); 12 C.F.R. §§ 1002.4(a), 1002.6(a), 1002.6(b)(1); *id.* Supp. I, cmt. 4(a)-1, 6(a)-2; 1002.6(a)-2; FRB Credit Scoring Report at O-5, 11, 36-37, 52; CFPB Credit Reporting System at 11; Carol A. Evans, Keeping Fintech Fair: Thinking About Fair Lending and UDAP Risks, *Consumer Compliance Outlook* 4-9 (2nd Issue 2017); Federal Trade Commission, *Big Data: A Tool for Inclusion or Exclusion? Understanding the Issues* 27-32 (2016); Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 *Cal. L. Rev.* 671 (2016); David Skanderson & Dubravka Ritter, *Fair Lending Analysis of Credit Cards*, Federal Reserve Bank of Philadelphia Payment Cards Center Discussion Paper 34-40 (August 2014).

<sup>48</sup> The failure to obtain a traditional score may not indicate that a particular applicant is “credit invisible.” For example, due to differences in coverage by the three nationwide consumer reporting agencies, some borrowers may lack a credit file with one company but still be score able by others. There are also differences in scoring thresholds and coverage among third-party scoring models. CFPB (2015) at 4-6; FRB Credit Scoring Report at 16-17.

<sup>49</sup> As discussed in Box 3.2.1, fair lending law has two principal theories of liability. We focused on disparate impact risk because the participants used highly automated underwriting systems. The Consumer Financial Protection Bureau stated in May 2018 that it was reexamining ECOA requirements concerning the disparate impact doctrine in light of recent Supreme Court case law and other developments. Consumer Financial Protection Bureau, *Statement of the Bureau of Consumer Financial Protection on Enactment of S.J. Res. 57* (May 21, 2018).

demographic groups.<sup>50</sup> Rather than acting as proxies for race and ethnicity or gender, the cash-flow variables and scores appeared to provide independent predictive value across all groups. Moreover, when compared to traditional credit scores and attributes, the cash-flow based metrics appeared to predict creditworthiness within the subpopulations at least as well as the traditional metrics, and better in selected cases. These results suggest that cash-flow variables and scores do not create a disparate impact among protected populations.

One should be cautious in extrapolating these results beyond the parameters of the study, since we lacked the data to conduct certain additional analyses with regard to the covered products and populations, as well as to study the use of cash-flow metrics in underwriting longer-term, larger balance loans and secured credit products. For example, we were not able to study the predictiveness of the data under more adverse economic conditions, to compare the predictiveness of particular types of cash-flow attributes and scores relative to each other, or to differentiate between small business and consumer underwriting. Nevertheless, we view the results as generally encouraging and as broadly consistent with the expected benefits of cash-flow based information based on the interviews with stakeholders as discussed above.

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<sup>50</sup> Because federal law prohibits collecting demographic information in connection with the credit products that were the subject of the study, 12 C.F.R. § 1002.5(b), fair lending analysis can only be conducted by first applying methodologies to estimate the likelihood that a particular borrower belongs to a particular demographic group based on one or more factors such as name and geography. These same kinds of techniques are commonly used and accepted by federal regulators in evaluating compliance with fair lending laws. Consumer Financial Protection Bureau, *Using Publicly Available Information to Proxy for Unidentified Race and Ethnicity: A Methodology and Assessment* (2014).

## 4. MARKET SURVEY

### *The Use of Cash-Flow Data Today*

Recent developments in the small business market suggest that a wide variety of financial services providers are also concluding that cash-flow data is beneficial for credit underwriting. After initial adoption by a group of new non-bank fintech companies, an additional wave of e-commerce platforms, payment processors, and accounting software developers has begun offering credit based on the cash-flow data that is generated in connection with their primary business lines. A number of traditional banks have also launched new lending programs based on cash-flow data, either on their own initiative or in partnership with non-bank providers.

This section provides a brief overview of these recent market developments, as well as the development of a new information ecosystem that is particularly important in facilitating transfers of bank account data between companies to facilitate credit underwriting and the provision of other financial products and services.

#### 4.1 The spread of cash-flow based underwriting

Although the small business lending market contracted dramatically in the immediate aftermath of the 2008 financial crisis, a new generation of fintech firms soon began to fill the vacuum through the use of online platforms for delivering various credit products to small businesses. Some of these companies became direct lenders in their own right, while others partnered with traditional financial institutions. But they all relied heavily on technology and data to manage customer acquisition, underwriting analyses, and service delivery. In particular, fintechs have emphasized increased use of alternative data—particularly electronic cash-flow sources—in highly automated underwriting models to provide loans in smaller amounts and on substantially faster turn-around times than many traditional banks were willing or able to offer.<sup>51</sup>

<sup>51</sup> Robert Armstrong, How Online Platforms Shook Small Business Lending in America, *Financial Times* (Jan. 29, 2019); Coulter King et al., Great Expectations: Improving the Loan Application Process for Small Business Borrowers, Oliver Wyman & Fundera (2017) (noting that the end-to-end process for small business loan approval can take weeks compared to automated underwriting used by fintechs).



### BOX 4.1 FINTECH CREDIT PROVIDERS

Non-bank technology firms first entered the small business financing market by introducing “merchant cash advance” products in the early to mid-2000s. Such products, which are not treated as loans under certain laws, provide a cash advance in return for purchasing a percentage of future credit card or debit card sales generally to be repaid on a daily or weekly basis as sales ebb and flow.

Around the time of the financial crisis, a second generation of fintech companies began developing credit underwriting models that incorporated electronic cash-flow data and in some cases other nontraditional information sources. Some of these companies operate as direct lenders that keep most of their loans on their own balance sheets after origination, while others operate as platform lenders that partner with issuing banks to originate loans and match the loans to investors that want to purchase the loans. In both cases, the fintechs have tended to operate almost entirely online, with no physical retail space and almost entirely automated underwriting models.

Fintech lenders grew rapidly in early years, causing many market observers to predict that they would push banks out of the small banking credit market. By about 2016, however, the fintech market started to cool off somewhat. Controversies about governance at particular companies, declines in satisfaction surveys relating to price and product terms, and questions about the sustainability of business models in light of cost of funds and customer acquisition challenges caused declines in stock prices. At the same time, banks and other new lender entrants began increasing their level of lending activities.

**Sources:** David W. Perkins, Marketplace Lending: Fintech in Consumer and Small-Business Lending, Congressional Research Service (updated Sept. 4, 2018); U.S. Department of the Treasury, A Financial System that Creates Economic Opportunities: Nonbank Financials, Fintech, and Innovation (July 2018); Peter Rudegeair, A \$150,000 Small Business Loan—From an App, *Wall St. J.* (Dec. 29, 2018); PWC, Redrawing the Lines: FinTech’s Growing Influence on Financial Services (2017); Mills, Chapter 5; Kevin Voigt, Pioneering the First Merchant Cash Advance, *nerdwallet* (Oct. 13, 2016); Andy Peters, Big Banks Kick Small-Business Lending into High Gear, *American Banker* (Aug. 9, 2017).

While fintech companies have not dominated small business lending markets as completely as some observers predicted early on,<sup>52</sup> the use of cash-flow data has continued to spread over the course of the decade to additional types of new entrants as well as to some incumbents, often in partnership with other market actors. Examples of different market participants leveraging electronic cash-flow data to facilitate their underwriting processes include:

- » Amazon, PayPal, and Square launched programs to provide loans and/or cash advances to small businesses in 2012, 2013, and 2014, respectively, based largely on transaction data from small businesses’ accounts with the companies. The companies generally collect repayment by deducting a fixed percentage or amount from transactions that are processed through their platforms. All three companies’ lending businesses have grown rapidly, though some recent news reports have suggested that their ability to predict credit risk has improved or would improve if they expanded their underwriting data to include outflows and payment history in addition to inflows.<sup>53</sup>
- » Eastern Bank, a Massachusetts-chartered community bank, launched a three-year partnership with local fintech developers in 2014 to create a product to help it automate its underwriting processes, including consideration of account data for existing customers, and

<sup>52</sup> Despite substantial conjecture globally focusing on rising fintechs, they are estimated to originate about one third of the balances in the personal unsecured loan market. Kate Rooney, Small Banks You’ve Never Heard of Are Quietly Enabling the Tech Takeover of the Financial Industry, *CNBC* (Feb. 15, 2019) (reporting TransUnion data through 2017). Marketplace lenders’ share of the small business market for loans under \$250,000 was estimated at approximately 4 percent as of 2015 and forecasted to reach 20 percent by 2020. *Business Insider Intelligence*, One Area of US Alt Lending Is Recovering, *Business Insider* (Feb. 23, 2017).

<sup>53</sup> Nicholas Megaw, Amazon Seeks to Revive Its Faltering Loans Business, *Financial Times* (June 13, 2019); Paul Sweeney, Online Loans You Can Take to the Bank, *debanked* (Apr. 16, 2019); Kate Rooney, PayPal and Square Quietly Grow Small Business Lending Using Data as Their Edge over Banks, *CNBC* (Nov. 16, 2018); *Debanked Staff*, Has PayPal Eclipsed OnDeck in Small Business Loans?, *debanked* (Apr. 26, 2019); Peter Rudegeair, A \$150,000 Small Business Loan—From an App, *Wall St. J.* (Dec. 28, 2018); Vivian Merker & Dan Rosenbaum, A Shakeout Is Coming in Small-Business Lending, *American Banker* (Nov. 27, 2018); Square Capital, Small Business Loans & Business Financing, available at [squareup.com/us/en/capital](https://squareup.com/us/en/capital); Square Capital, Tips for Small Business Financing: How to Get Noticed by Square Capital, available at [squareup.com/townsquare/tips-for-small-business-financing-how-to-get-noticed-by-square-capital](https://squareup.com/townsquare/tips-for-small-business-financing-how-to-get-noticed-by-square-capital).



improve customer acquisition through digital marketing. The product is now being sold to other community banks through a spin-off company, Numerated Growth Technologies.<sup>54</sup>

- » Beginning in 2015, online lender Foundation partnered with Regions Bank, Citizens Bank, and networks of community banks to provide platforms for underwriting small business loans using cash-flow and other data, with same-day decisions and funding within three days of approval.<sup>55</sup> Recently, Provident Financial announced a partnership with Foundation to offer unsecured small-dollar loans to commercial clients.<sup>56</sup>
- » In 2015 and 2016, several of the nation's largest banks rolled out streamlined lending programs that relied in part on review of account information for existing business deposit customers. For instance, Wells Fargo found transaction account data to be "invaluable" to its underwriting process when it introduced its FastFlex small business program in 2016 to provide loans in the \$10,000 to \$35,000 range.<sup>57</sup> JPMorgan Chase began offering a digital, small-dollar business loan product to business deposit account customers using OnDeck's underlying technology to perform automated underwriting of cash-flow and other data.<sup>58</sup> Bank of America adopted a streamlined underwriting process for lines of credit to existing customers of up to \$100,000 that incorporates checking and merchant payment processing account data.<sup>59</sup>
- » Community development financial institution Opportunity Fund and Lending Club established a partnership in 2016 and expanded to a tripartite agreement with Funding Circle in 2019. The partnership involves sharing customers, online application technology, and credit assessment tools, including those used to assess cash-flow data, to better and more quickly reach underserved populations and more established businesses.<sup>60</sup>
- » After launching a \$100 million small business lending fund in partnership with OnDeck in 2015,<sup>61</sup> accounting software provider Intuit announced in 2017 that it would begin providing small business loans in its own right building off companies' information in Intuit's QuickBooks product, as well as third-party sources.<sup>62</sup>

<sup>54</sup> Debra Cope, How a Digital Commercial Loan Gets Made, ABA Banking Journal (Apr. 29, 2019); FIS, Eastern Bank Achieves 4X Small Business Lending Growth with FIS Real-time Lending Powered by Numerated (2019); Penny Crosman, Eastern Bank-Created Fintech Numerated Lands Two New Bank Clients, American Banker (Mar. 12, 2018).

<sup>55</sup> Sweeney; Tom Groenfeldt, Case Study: Citizens Bank—Fintech Friendly, FinTechFutures (Feb. 19, 2019); Foundation Digitizes SMB Loans for Banc of California, PYMNTS.com (Jan. 24, 2019).

<sup>56</sup> John Reosti, A 'Turtle Bank' Plays Catch-Up in Small-Business Lending, American Banker (July 2, 2019); Foundation Pulls Community Bank Into FinTech Collaboration, PYMNTS.com (July 3, 2019).

<sup>57</sup> Mills, Chapter 9; Jeff Gitlen, Wells Fargo Small Business Loans and Financing Review, LendEdu (Oct. 26, 2018); Ryan Lichtenwald, Wells Fargo Enters Small Business Lending with FastFlex, Lend Academy (June 2, 2016).

<sup>58</sup> Chase's processes allowed it to pre-score existing customers based on data from their ongoing account relationship so that customers could apply in minutes. Chase recently announced that it was concluding its relationship with OnDeck and closing out existing offers. Peter Renton, An In Depth Look at the OnDeck/JPMorgan Chase Deal, Lend Academy (Dec. 4, 2015); Tanaya Macheel, One Year In: How JPMorgan Is Transforming Small-Business Lending, Tearsheet (June 11, 2017); Kevin Wack, What JPMorgan's Latest Moves Reveal about Online Lending's Future, American Banker (Aug. 11, 2017); Kevin Wack, JPMorgan Chase Ends Business Loan Partnership with OnDeck, American Banker (July 29, 2019).

<sup>59</sup> Simon (2015) at 3; Ruth Simon, The Coffee-Break Loan: Business Owners Promised Money in Five Minutes, Wall St. J. (Mar. 12, 2016).

<sup>60</sup> Opportunity Finance Network, Blog, Opportunity Fund Begins National Expansion Lending to Small Businesses in 12 States, Increases Lending in California, Opportunity Finance Network (June 7, 2017); Next Street, CDFI Leaders Thinking Ahead and Acting Now: Luz Urrutia, Opportunity Fund, [nextstreet.com](http://nextstreet.com) (Mar. 15, 2018); Peter Renton, LendingClub Changes Strategy with Small Business Lending, Lend Academy (Apr. 23, 2019).

<sup>61</sup> Caitlin Huston, Intuit and OnDeck Partner to Offer \$100 Million Small Business Lending Fund, MarketWatch (Sept. 17, 2015).

<sup>62</sup> Justin Song, Small-Biz Talks: QuickBooks Capital on Small Business Lending, ValuePenguin (Nov. 27, 2018); Rudegear; Suman Bhattacharya, 'We're Homing in on the Underserved': Intuit Wants to Lend Small Businesses Money, Tearsheet (Nov. 8, 2017).

In addition, a number of banks have begun investing in loans made by fintech lenders who may rely on cash-flow data in their underwriting models.<sup>63</sup>

These initiatives reflect a diversity of approaches as to the specific sources and uses of cash-flow data. For example, it is often substantially easier for banks to access deposit information of existing customers than to implement the contracts and technology needed to collect electronic information from external sources. In addition, even aside from technical hurdles, different market actors may have different approaches as to their willingness to rely solely on data from e-commerce and payment processor sources as compared to accounting software feeds or bank transaction records, since each has different advantages and disadvantages as to scope, completeness, and granularity. For example, entries into accounting software may vary with regard to the level of detail, consistency, and accuracy of information. Accordingly, it can be effective to combine and compare data from accounting software vendors with other sources, such as bank accounts or sales transaction records, to develop a more complete analysis of applicants' finances. Similarly, sales transaction records provide useful information on income, inventory, return rates, and related topics, but do not typically provide detailed information on how small businesses manage recurring payments and other expenses. Bank account data show both inflows and outflows, though with less detail as to individual customer transactions compared to payment processor or e-commerce platform data. The extent to which particular financial services providers weigh cash-flow data versus traditional credit bureau information and other inputs also varies widely.<sup>64</sup>

Thus, while the period of experimentation has not yet settled into standardization, the drive to harness new forms of cash-flow data appears to be occurring in many parts of the market. Although research is not publicly available for many of these initiatives, studies of fintech credit providers who are the most likely to use electronic cash-flow data suggest that they are having an impact on access to credit for underserved populations. For example, one survey indicates that African-American applicants have a 51 percent approval rate for loans sourced through online lenders that tend to incorporate cash-flow data into credit underwriting, compared to approval rates of roughly 40 percent and 30 percent, respectively, at small and large banks. Similarly, Hispanic applicants had a 68 percent approval rate for loans sourced through online lenders compared to approval rates of roughly 55 percent and 50 percent, respectively, for small and large banks.<sup>65</sup>

## 4.2 Growth of a new data sharing architecture

A second set of market developments that has been instrumental to the growing use of electronic cash-flow data for small business underwriting has concerned the architecture for transferring such data between companies. In some cases, lenders and lending platforms have negotiated directly with data sources to transfer information as directed by the small business applicant via an application programming interface (API), which is a software intermediary that allows two websites or applications to exchange information.<sup>66</sup> In other cases, particularly involving transfers of bank account

<sup>63</sup> David W. Perkins, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, Congressional Research Service 6-7 (updated Sept. 4, 2018); Julapa Jagtiani & Catharine Lemieux, *Small Business Lending After the Financial Crisis: A New Competitive Landscape for Community Banks*, Federal Reserve Bank of Chicago Economic Perspectives 15-17 (3rd Issue 2016).

<sup>64</sup> Other traditional information sources are also becoming easier to access electronically. For example, under legislation signed on July 1, 2019, the Internal Revenue Service is implementing a consent-based income verification system to facilitate real-time access to tax data. P.L. 116-25 (July 1, 2019).

<sup>65</sup> Federal Reserve Banks 2016 Minority-Owned Firms Survey at 14-16; Robb et al., at 25-30. However, as discussed below in Section 5, satisfaction levels are substantially lower with online lenders due to price and product terms as compared with banks. This pattern holds for both minority and non-minority borrowers. Federal Reserve Banks 2016 Minority-Owned Firms Survey at 15-16.

<sup>66</sup> Conrad Sheehan, *APIs: An Enabler for Transformation in Financial Services*, Accenture.com (July 19, 2018); Rob Hunter, *APIs Are the Way Forward for Better Data Security*, American Banker (July 18, 2018).

information, most lenders and lending platforms rely on a new group of technology intermediaries called “data aggregators” to facilitate the transfers.<sup>67</sup> Data aggregators first developed to support various types of wealth advisory and personal financial management (PFM) services that provide consumers with consolidated access to their credit, payments, and asset management accounts, but now support a variety of other “use cases,” including data transfers to facilitate credit underwriting.

Historically, aggregators have operated by obtaining permission and log-in credentials from the small business or consumer who owns the transaction account, using the credentials to log on to the digital platform, and using a method called “screen scraping” that relies on proprietary software to copy information displayed on the data source’s customer-facing webpages. However, such techniques raise a number of concerns with regard to the risk of potential misuse of credentials, accuracy, and burdens on data sources’ systems.<sup>68</sup>

More recently, banks and other data sources have been working with aggregators to develop more efficient and secure methods of authentication and data transfer. These efforts include shifting to tokens that permit authorized data access without sharing credentials or providing the ability to conduct transactions, as well as shifting from screen scraping to APIs to improve the efficiency of data transfers. However, the resources needed to build APIs can be substantial particularly for smaller banks, and the process of negotiating related data sharing agreements is raising some complications. Banks have been using the contracting process to address issues about information security, insurance, liability in the event of breaches, and other issues. However, aggregators and downstream users have also accused banks of unduly limiting the scope of what information can transfer for competitive reasons.<sup>69</sup>

In fall 2018, a cross-industry group called the Financial Data Exchange was launched to address concerns about consistency, scalability, and other issues in connection with customer-permissioned data transfers.<sup>70</sup> The group has focused initially on promoting a standardized API and data specifications across institutions, but its ultimate scope and impact remain to be seen.<sup>71</sup> There also have been calls for regulators to resolve various areas of legal uncertainty with regard to the new ecosystem and to implement section 1033 of the Dodd-Frank Act, which provides consumers with a right to access their own account and transaction information to the extent that it is maintained by “covered persons” in the ordinary course of their businesses, subject to rules defined by the Consumer Financial Protection Bureau.<sup>72</sup> Even in the absence of more consistent standards, however, the new data-sharing ecosystem has already become quite extensive, with aggregators reporting coverage for at least 95 percent of U.S. deposit accounts.<sup>73</sup>

**67** See generally U.S. Department of the Treasury, *A Financial System that Creates Economic Opportunities: Nonbank Financials, Fintech, and Innovation* 23-38 (2018) (hereinafter U.S. Treasury Fintech Report); Consumer Financial Protection Bureau, *Request for Information Regarding Consumer Access to Financial Records*, 81 Fed. Reg. 83806 (Nov. 22, 2016) (hereinafter CFPB Request for Information); Laura Brodsky & Liz Oakes, *Data Sharing and Open Banking*, McKinsey & Co. (2017).

**68** U.S. Treasury Fintech Report at 23-38; CFPB Request for Information, 81 Fed. Reg. at 83809.

**69** U.S. Treasury Fintech Report at 23-38; Nathaniel Popper, *Banks and Tech Firms Battle over Something Akin to Gold: Your Data*, N.Y. Times (Mar. 23, 2017); Mary Wisniewski, *Banks vs. Aggregators: Who Will Budge in the Data-Sharing Battle?*, American Banker (Nov. 28, 2017).

**70** Penny Crosman, *Big Banks, Aggregators Launch Group to Hash Out Data-Sharing Issues*, American Banker (Oct. 18, 2018).

**71** For updates as of August 2019 see Financial Data Exchange, *The ABC’s of APIs* (2019); Financial Data Exchange, *The Global Industry Standard for Consumer Access to Financial Data* (2019).

**72** 12 U.S.C. § 5533. The CFPB has not issued regulations to implement the provision or clarified whether it is effective in the absence of such regulations, which has led to fierce debates among stakeholders as to its scope and impact. U.S. Treasury Fintech Report at 23-38.

**73** Michael Deleon, *A Buyer’s Guide to Data Aggregation*, Tearsheet (Feb. 19, 2019).

## 5. POLICY ANALYSIS

### *The Use of Cash-Flow Data Tomorrow*

Based on FinRegLab's research and engagement with market participants over the last year, it appears that use of cash-flow data in underwriting is spreading more rapidly in small business lending than in consumer credit markets. Nevertheless, stakeholders have identified several issues that may affect the nature and pace of further growth going forward, as well as important considerations about how to structure cash-flow based underwriting to mitigate risks and encourage the spread of practices that benefit small business owners.

Several factors may account for the faster pace of adoption in small business markets, including a broad interest in increasing automation, the fact that traditional lenders have always relied upon cash-flow data to evaluate small business applicants, recognition that third-party credit scores have historically not been as helpful in predicting credit risk among small businesses as they are in consumer markets, and the fact that uncertainty about compliance issues is lessened in the small business context because certain federal consumer protection laws have limited if any applicability.

Yet both market dynamics and policy questions could impact the nature and pace of further adoption. This section briefly outlines some of the considerations that are most relevant to the small business market and notes ways in which they intersect or overlap with broader borrower protection concerns in small business lending. The forthcoming Market Context & Policy Analysis provides more detailed analyses of market and policy issues concerning the use of cash-flow data in credit underwriting across both consumer and small business markets, as well as issues concerning the new ecosystem for customer-permissioned data sharing.

#### 5.1 Public research to inform further market development

Questions about the effectiveness of cash-flow data in predicting credit risk across different populations and products are fundamental to the pace of its adoption. As discussed in Section 2, the nature of cash-flow data as compared to traditional credit reports suggests that it should have substantial predictive power in the small business context, for instance because it provides more recent and detailed information about revenue and reserves in addition to expenses. Indeed, that is why traditional lenders have long relied on paper-based cash-flow and bank statements as components

### BOX 5.1 BROADER SMALL BUSINESS PROTECTION CONCERNS

Borrower protection concerns are attracting substantial attention in small business financing markets as product types and providers have diversified over the last two decades.

Many concerns stem from the fact that many of the newer, technology-reliant providers of small business financing are providing products that are substantially more expensive than traditional sources of small business credit and that rely on different repayment provisions, such as daily or weekly remittances based on sales volume. Defenders assert that such practices are driven by higher costs and that structuring repayment terms to vary with sales volumes can be advantageous to small businesses. Critics assert that some products and practices are predatory and may trap borrowers in debt that will jeopardize their ability to maintain their businesses and access more favorable credit over time.

These concerns are heightened by the fact that many core federal borrower protections are limited to consumers. For example, standardization of disclosures about prices and product features is not required by federal law because the Truth in Lending Act is limited to products used primarily for personal, family, and household purposes. The Fair Credit Reporting Act also has limited application in the commercial space.

The U.S. Department of the Treasury called for greater borrower protections for small businesses in 2016. No new federal laws or regulations have been adopted since that time, although the Federal Trade Commission recently announced an enforcement initiative looking at potentially unfair and deceptive acts and practices in merchant cash advances and other small business

financing. A New York law signed in August 2019 has restricted the use of certain contract provisions called “confessions of judgment” in small business loans, and California adopted a disclosure law in late 2018 that will take effect once proposed regulations are finalized. As part of a broader coalition of lenders, investors, and advocates, about 60 companies have also voluntarily adopted a “Small Business Borrowers’ Bill of Rights” that addresses transparency, product structures, and various practices; the same group is advocating for federal truth in lending legislation.

Recent surveys suggest that borrower concerns about transparency have moderated somewhat across all types of small business lenders. However, dissatisfaction with price and repayment terms are substantially higher for online lenders than for large and small banks.

**Sources:** U.S. Department of the Treasury, Opportunities and Challenges in Online Marketplace Lending 23-24, 28 (2016); Alex Yong, First Small Business Truth-in-Lending Act Passed in California, *SmallBusinessTrends* (Oct. 28, 2018); Zachary Mider & Zeke Faux, FTC, Manhattan Prosecutors Probe Costly Small-Business Loans, *Bloomberg* (May 23, 2019); Zachary R. Mider & Zeke Faux, The Predatory Lending Machine Crushing Small Businesses Across America, *Bloomberg Businessweek* (Nov. 20–Dec. 20, 2018); Responsible Business Lending Coalition, Policy Recommendations for a Small Business Truth in Lending Act (2018); Responsible Business Lending Coalition, Small Business Borrowers’ Bill of Rights (2015); Small Business Majority, Small Business Owners Concerned with Predatory Lending, Support More Regulation of Alternative Lenders (Dec. 12, 2017); Liz Farmer, Are Predatory Business Loans the Next Credit Crisis?, *Governing* (May 2015); Federal Reserve Banks 2018 Employer Survey at 20-21, 25; Federal Reserve Banks 2017 Nonemployer Survey at 14; Federal Reserve Banks, 2016 Small Business Credit Survey: Report on Employer Firms 17 (2017); Zachary Mider, Cuomo Signs Bill Cracking Down on Certain Small Business Lending Abuses, *Bloomberg Business* (Aug. 30, 2019).

of small business underwriting. Obtaining similar data electronically from multiple third-party sources facilitates not only faster underwriting, but also more sophisticated analyses of some of the same factors that historical models have always relied upon. For example, it could facilitate the process of developing more tailored risk management ratios for younger, smaller businesses within particular industries.

As discussed above and in greater detail in the Empirical Research Findings report, FinRegLab’s applied research helps to validate cash-flow data’s predictive potential. The market developments discussed in Section 4 suggest that a growing number of market participants are also recognizing cash-flow data’s potential benefits. However, more public research would be helpful to assist regulators, firms, and advocates to develop a deeper understanding of its value and limitations in modelling credit risk. Potential research topics include:

- » Additional analysis of cash-flow data for underwriting small business products similar to those in our original research, for instance to study the relative predictiveness of particular types of cash-flow variables and attributes.



- » Evaluation of the predictiveness of cash-flow data in underwriting loans with longer durations, larger principal amounts, and different product structures, such as secured loans.
- » Evaluation of predictiveness during different stages in credit and business cycles, on a *pro forma* basis if actual performance data is not available.

Continuing to expand publicly available empirical research could be particularly useful in facilitating greater confidence in cash-flow based underwriting among secondary market actors and regulators who may have concerns about the reliability of new underwriting models. Securitization has always been a challenge with regard to small business loans because of the lack of standardized data, and continues to remain one today as the market undergoes a period of substantial innovation.<sup>74</sup> Market participants currently report that they are having to “cross-walk” information on loan portfolios that were originated using electronic cash-flow data and other less traditional information sources back to traditional credit scores because such scores permit more standardized comparisons for purposes of securitization, despite recognition that such scores historically have not been as helpful in predicting credit risk among small businesses as in other markets.

With regard to performance during economic downturns, it is sometimes difficult to separate out any specific concerns about cash-flow data in particular from broader concerns about alternative data and/or fintech lenders more generally.<sup>75</sup> For example, many of the concerns about non-bank lending platforms are driven at least in part by differences in the platforms’ capital structures and revenue sources relative to traditional banks.<sup>76</sup> Where sources have focused on aspects of alternative data that are more specific to cash-flow information, the discussions suggest that the fact that such data provides a timely and detailed picture of shifts in borrowers’ financial situations could cut both ways; some sources suggest that it could position lenders to begin working with borrowers earlier to avoid defaults and more quickly after business conditions start to improve, while other sources suggest that there is some risk that quick tightening of credit standards could worsen downturns.<sup>77</sup> In any event, in the absence of more publicly available research or standardization of underwriting practices, prudential regulators may be more likely to encourage banks to engage in extensive stress testing and to consider concentration limits in connection with fintech partnerships or loan purchases until business models can be further validated in different economic conditions.<sup>78</sup>

Thus, although financial services providers have strong incentives to want to protect proprietary information, an “each company for itself” approach can have potential drawbacks with regard to facilitating securitization and addressing potential regulatory concerns. Further developing a factual record and common understanding as to the benefits and limitations of cash-flow data could be important for helping beneficial practices reach scale, for instance by informing both how general

<sup>74</sup> FRB Small Business Report at 58-59; Mills, Chapter 4 [e-book]; U.S. Department of the Treasury, Opportunities and Challenges in Online Marketplace Lending 25-26, 29 (2016) (hereinafter U.S. Treasury Marketplace Lending Report).

<sup>75</sup> See generally U.S. Government Accountability Office, Financial Technology: Agencies Should Provide Clarification on Lenders’ Use of Alternative Data 14-16 (2018) (hereinafter GAO Alternative Data Report); U.S. Treasury Marketplace Lending Report at 8, 23, 33; U.S. Treasury Fintech Report at 136-37; Perkins at 9-12; Armstrong.

<sup>76</sup> For example, discussions of business or credit cycle risk frequently point out that platform lenders typically do not have diversified business activities relative to banks, rely on relatively expensive and impatient sources of funding, and in some cases rely solely on fee income from new originations rather than repayment of loans over time. All of these features make it harder to survive a downturn in which losses are higher, the cost of capital increases, and demand for loans is lower. GAO Alternative Data Report at 14-16; Perkins at 9-12; see also Todd Baker, Marketplace Lenders Are a Systemic Risk, *American Banker* (Aug. 15, 2015). Some sources have suggested that improving securitization markets could reduce business cycle risks for platform lenders. U.S. Treasury Marketplace Lending Report at 25-26.

<sup>77</sup> Armstrong; Marshall Lux & Guillaume Delepine, Revolution in Data: How New Technologies Are Upending Borrowing, Harvard Kennedy School Mossavar-Rahmani Center for Business & Government Associate Working Paper Series No. 107, at 29-30 (February 2019).

<sup>78</sup> See, e.g., Office of the Comptroller of the Currency, Semiannual Risk Perspective 12-23 (Spring 2019); Federal Deposit Insurance Corporation Financial Institution Letter 49-2015 (Nov. 6, 2015); Angela Herrboldt, Marketplace Lending, FDIC Supervisory Insights 12-18 (Issue 2, 2015).

industry standards could be set constructively and by developing greater understanding and confidence in more independent and/or proprietary applications of the data.

## 5.2 Inclusion and fair lending effects

A second, related question that could affect the scale and pace of further expansion of cash-flow based underwriting is the degree to which cash-flow variables and scores affect both inclusion goals and fair lending risks. Particularly in light of the differences in access to small business credit among minorities, recent immigrants, and women, it may be helpful to consider that there are actually two types of uncertainty at issue here—first, the risk that cash-flow based underwriting may have negative impacts on protected groups, and second that the fear of creating negative impacts will slow the adoption of innovations that could actually benefit members of those groups.<sup>79</sup>

Again, while our empirical research results are encouraging in this regard, additional research would be helpful:

- » A central question on this topic is the extent to which cash-flow data is useful both in helping to underwrite populations that are largely shut out of traditional credit reporting systems altogether and in improving predictions of credit risk among applicants who have more conventional credit histories. As discussed above and in the Empirical Research Findings report, both the nature of the data itself and the applied research suggests that the data is useful for both purposes.
- » A second important question is how companies may factor cash-flow variables and data into pricing models, which are often designed separately from eligibility algorithms though they may rely on some of the same data. For instance, we did not evaluate the extent to which the use of such data results in reduced pricing for certain applicants compared to conventionally underwritten loans, and whether pricing effects alter disparate impact risks.

Answering questions about disparate impact risk requires much work to be done at the individual firm level, since it depends on how each company constructs its particular eligibility and pricing algorithms. While federal regulators have noted in informal guidance that cash-flow data in consumer and small business underwriting is less likely to pose fair lending risk than other types of alternative data because it has an obvious link to creditworthiness and is a logical extension of current underwriting practices, they have also emphasized the importance of lenders and model developers performing their own individualized assessments of potential disparate impact risk for their particular underwriting models.<sup>80</sup> Government reports suggest that fintech lenders are performing these kinds of analyses in developing new underwriting models,<sup>81</sup> though details are limited and fair lending analysis in the small business context is complicated relative to consumer lending

<sup>79</sup> As discussed above in Section 3, the primary focus of fair lending analyses in the context of using particular data types in automated underwriting models is the disparate impact theory, which prohibits the use of facially neutral practices that have a disproportionately negative effect on members of a protected class, unless those practices are meeting a legitimate business need that cannot reasonably be achieved by less impactful means 12 C.F.R. §§ 1002.4(a), 1002.6(a), 1002.6(b)(1); *id.* Supp. I, cmt. 4(a)-1, 6(a)(2)-1.

<sup>80</sup> Carol A. Evans, *Keeping Fintech Fair: Thinking About Fair Lending and UDAP Risks*, Consumer Compliance Outlook (2nd Issue 2017).

<sup>81</sup> GAO Alternative Data Report at 35 (discussing activities by fintech small business, consumer, and student lenders).



by certain definitional and data issues.<sup>82</sup>

While the positive potential of cash-flow data is intuitive, forecasting overall impacts on the market is challenging due to a number of factors. For example, to the extent that cash-flow data is more broadly available than traditional credit history (personal or commercial) and is making the underwriting of smaller loans to younger businesses more cost-effective, it can potentially help substantial numbers of businesses owned by minorities, recent immigrants, and women access credit that would otherwise be unavailable. Yet other financial constraints (such as the ability to access equity investments) may affect particular companies' ability to generate revenue and manage cash flow in the first instance, and it is difficult to find data on the extent to which there may be differences among business owners of different demographic backgrounds with regard to use of business checking accounts, accounting software, or engagement with e-commerce platforms and payment processors. Thus, while cash-flow data is promising, it is not likely to close all gaps between borrowers of different demographic backgrounds.

And to the extent that cash-flow data also substantially improves predictiveness for borrowers who can already access traditional credit, it may have impacts in both directions. While some borrowers may receive larger loans or better terms relative to a less predictive model, others may receive less favorable terms or be denied credit altogether. Such denials may help to ensure that applicants who actually would not be able to repay a loan do not obtain unaffordable credit, but such outcomes make analysis of the net potential effects of using such data more complicated across larger groups.

The impacts on pricing across the market may also be complicated to estimate. Some research in connection with the initial adoption of credit scoring in small business lending in the mid 1990s found that the use of such scores increased access to credit to underserved borrowers and low- and moderate-income communities but also generated an increase in average credit prices because borrowers who previously would have been rejected altogether were instead offered loans with price terms that had been adjusted for their increased risk of default.<sup>83</sup> And to the extent that pricing by particular types of lenders is affected by other factors such as relative cost of funds and overhead, the market-wide impacts from cash-flow underwriting specifically may be difficult to isolate. This is another area where adoption of cash-flow data intersects with broader policy debates, such as concerns about the degree to which recent market entrants' loans are benefitting underserved populations due to the fact that they often charge higher prices.<sup>84</sup>

The Market Context & Policy Analysis report will consider these issues in more detail.

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<sup>82</sup> Although ECOA applies to business lending, data sources are not as robust or as standardized as in consumer lending and definitional questions can arise for example with regard to what constitutes a woman- or minority-owned business. See generally Laura L. Gleason & Elizabeth Gavin, Consumer Compliance Requirements for Commercial Products and Services, Consumer Compliance Outlook (1st Issue 2015); Consumer Bankers Association, Letter to the Honorable Richard Cordray re Docket No.: CFPB-2017-0011 - Small Business Data Collection (Sept. 13, 2017); Premier Insights, Blog, Two Problems with Fair Lending and Commercial Loans (Apr. 25, 2017), [www.premierinsights.com/blog/two-problems-with-fair-lending-and-commercial-loans](http://www.premierinsights.com/blog/two-problems-with-fair-lending-and-commercial-loans). The CFPB has authority to write regulations to compel standardized reporting of commercial lending information, but it is relatively early in its rulemaking process and has been sued by a group of community organizations for not moving faster to complete the regulations. Consumer Financial Protection Bureau, Request for Information Regarding the Small Business Lending Market, 82 Fed Reg. 22318 (May 15, 2017); Andrew Keshner, Federal Lawsuit Says CFPB Should Collect Data on Business-Loan Applications from Women and Minorities, Marketwatch (May 14, 2019).

<sup>83</sup> Allen N. Berger et al., Credit Scoring and the Availability, Price, and Risk of Small Business Credit, 37 J. of Money, Credit, and Banking 191 (2005); W. Scott Frame et al., Credit Scoring and the Availability of Small Business Credit in Low- and Moderate-Income Areas, 39 The Financial Review 35-54 (2004).

<sup>84</sup> See generally GAO Alternative Data Report at 31-32 (discussing debates about whether fintech lenders' higher prices are driven solely by higher cost of funds or by rent-seeking). Surveys of small business borrowers consistently find that satisfaction levels are lower with online lenders than with large or small banks, largely due to higher interest rates and unfavorable repayment terms. See Box 5.1; Federal Reserve Banks 2018 Employer Survey at 20-21, 25 (reporting historical data); Federal Reserve Banks 2017 Nonemployer Survey at 14 (same). For further discussion of operating costs among different types of lenders, see subsection 5.5. below.

## 5.3 Consistency with broader notions of fairness, transparency, and privacy

As reliance on cash-flow based variables and scores continues to spread in the market, it is also important to consider ways to structure underwriting processes consistent with broader notions of fairness, transparency, and privacy. In the consumer lending context, laws such as the Equal Credit Opportunity Act, Fair Credit Reporting Act, and Gramm-Leach-Bliley Act impose specific requirements that help to manage some of these issues. Prohibitions against unfair, deceptive, and abusive acts and practices may also be relevant. While not all of these laws are applicable to business loans, the underlying policy issues that the laws are designed to address are often important to small business applicants as well. Thus, consideration of these issues can be important both to mitigate potential risks to small business applicants and to empower them to take advantage of market changes that can increase their ability to access credit.

This section outlines illustrative examples of such questions, which are discussed in more detail in the Market Context & Policy Analysis report.

### 5.3.1 Transparency regarding lending criteria and data sources

Transparency with regard to small business lending generally is a substantial concern because such credit is not subject to the Truth in Lending Act, which mandates consistent disclosure of various pricing and product terms in the consumer lending context.<sup>85</sup> While concerns about the transparency of the credit decisioning process do not tend to attract as much attention, important legal and policy issues can arise in that context as well. To take just a few examples:

- » Federal regulators have pursued enforcement actions for deceptive practices against a credit card lender who failed to disclose that its advertised credit limits would be reduced if cardholders took cash advances or made certain types of expenditures. While the law does not generally require an affirmative disclosure of underwriting criteria, the Federal Trade Commission asserted it was deceptive to fail to tell potential applicants that their ability to access the credit as advertised could be reduced by their usage choices.<sup>86</sup> Although the particular case involved consumer cards, federal prohibitions against unfair and deceptive acts and practices have also been applied to protect small business owners.<sup>87</sup>
- » The Equal Credit Opportunity Act, which applies to both consumer and commercial credit, requires that lenders provide disclosures explaining the specific, principal reason(s) for taking

<sup>85</sup> See, e.g., Box 5.1; Barbara J. Lipman & Ann Marie Wiersch, *Alternative Lending Through the Eyes of 'Mom & Pop' Small Business Owners: Findings from Online Focus Groups*, Federal Reserve Bank of Cleveland (2015). In surveys and focus groups of small businesses, dissatisfaction with regard to transparency as to price and product features appears to drive far lower satisfaction rates for on-line lenders as compared to more traditional credit sources, despite favorable views as to the application process, convenience, and speed of funding. Barbara J. Lipman & Ann Marie Wiersch, *Browsing to Borrow: 'Mom & Pop' Small Business Perspectives on Online Lenders*, Board of Governors of the Federal Reserve System 5, 10 (2018); Ann Marie Wiersch et al., *Click, Submit: New Insights on Online Lender Applicants from the Small Business Credit Survey 9*, Federal Reserve Bank of Cleveland Community Development Department (2016).

<sup>86</sup> *FTC v. CompuCredit Corp.*, No. 1:08-cv-1976-BBM-RGV (N.D. Ga. June 10, 2008), [www.ftc.gov/sites/default/files/documents/cases/2008/12/081219compucreditstiporder.pdf](http://www.ftc.gov/sites/default/files/documents/cases/2008/12/081219compucreditstiporder.pdf); Federal Trade Commission, *Big Data: A Tool for Inclusion or Exclusion? Understanding the Issues* 22 (2016).

<sup>87</sup> *FTC v. IFC Credit Corp.*, 543 F. Supp. 2d 925, 943 (N.D. Ill. 2008) (upholding the FTC's interpretation of the Federal Trade Commission Act as applying to small business owners). In May 2019, the FTC announced an initiative to look into potential unfair and deceptive acts and practices in the small business lending industry, including merchant cash advances. Zachary Mider & Zeke Faux, *FTC, Manhattan Prosecutors Probe Costly Small-Business Loans*, Bloomberg (May 23, 2019); Mark T. Daebertin, *Blog, FTC Investigates Small Business Financing Based on Expansive View of UDAP Authority*, Pepper Hamilton (June 7, 2019).

an “adverse action” in the credit underwriting process, such as a refusal to grant credit in substantially the amount or on substantially the terms requested.<sup>88</sup>

- » The Fair Credit Reporting Act also requires adverse action notices where lenders take such action based on information contained in external data sources, in part to facilitate applicants’ ability to check the underlying data for potential inaccuracies.<sup>89</sup> The FCRA has been interpreted by the Federal Trade Commission to apply to situations in which business lenders rely on applicants’ personal credit scores or credit reports for underwriting purposes,<sup>90</sup> but not to credit reports about businesses.<sup>91</sup>

Beyond the specific legal requirements and prohibitions to the extent that they apply in the small business context, these examples illustrate more broadly how promoting increased transparency regarding lending criteria and data sources can be important to address concerns about basic fairness, to reduce the risk of errors in the underwriting process, and to increase the benefits for small businesses and credit providers alike.

For example, while cash-flow analysis has long been a part of traditional small business underwriting to some extent, it is helpful for potential borrowers to understand how particular financial practices may affect their credit evaluations as lending criteria evolve. To the extent that reliance on cash-flow data is placing increased emphasis on how small businesses manage their transaction accounts, for instance, they may want to adjust their practices to ensure that they do not inadvertently jeopardize their credit applications. Borrowers also have important interests in understanding the extent to which lenders intend to monitor cash-flow data over time, for instance for purposes of potentially adjusting credit terms over the life of the loan.<sup>92</sup> Thus, while companies understandably want to protect proprietary information about the details of their underwriting models, it is important to consider how general education materials, marketing, application-stage communications, and post-application disclosures can affect small businesses’ ability to leverage the benefits of cash-flow based underwriting over time.

**88** 12 C.F.R. §§ 1002.2(c), 1002.9. Some of the procedural requirements differ depending on whether a business applicant has \$1 million or less in gross revenues during the prior fiscal year. 12 C.F.R. § 1002.9(a)(3). Notices for smaller businesses must generally follow the same timing and content rules as for consumer notices, but can be provided orally or in writing. Lenders also have the option of disclosing at the time of application rather than after adverse action is taken that applicants have the right to request the reason for the actions taken. Notices for businesses above the threshold must be provided orally or in writing within a reasonable time but are not subject to a specific 30-day limitation. *Id.*

**89** 15 U.S.C. §§ 1681m(a) (requiring disclosures in situations in which adverse action is taken “with respect to any consumer that is based in whole or in part on any information contained in a consumer report”), 1681m(b) (requiring disclosures in situations in which adverse action is connection with credit for personal, family, or household purposes based on other external sources of information about the consumer applicant). The question of whether cash-flow data that is obtained via a data aggregator for purposes of credit underwriting may constitute a “consumer report” under the FCRA has not yet been addressed by regulators or courts.

**90** Federal Trade Commission, 40 Years of Experience with the Fair Credit Reporting Act: An FTC Staff Report with Summary of Interpretations 10, 21 (2011) (summarizing and reaffirming informal staff interpretations issued in 2000 and 2001). The FTC interpretations were issued informally as staff opinions rather than as formal regulations. The Consumer Financial Protection Bureau does not appear to have addressed the issue since receiving various types of interpretative and regulatory authority pursuant to the Dodd-Frank Act.

**91** *Id.* at 21 (“A report that concerns the consumer’s business history (as opposed to personal credit or employment history) that is collected and provided by a commercial reporting service solely for use in business transactions is not a “consumer report.” (Similarly, the report provider is not a [consumer reporting agency].)”).

**92** In the consumer lending space, the Fair Credit Reporting Act has been interpreted to permit lenders to pull consumer reports without obtaining permission from borrowers for purposes of determining whether to take a specific action with regard to the account, such as modifying the terms of an open-end line of credit or deciding whether to participate in a debt management plan. Absent such specific actions, however, lenders must generally obtain consumer permission to access a credit report in connection with existing credit unless the account is in a collections posture. *Id.* at 13-14, 37-38, 43-45. As noted above, the FCRA’s applicability in the business context is limited, and expectations about monitoring of small business loans may be somewhat different. FRB Small Business Report at 17 (noting that lenders typically have to monitor credit arrangements with individual borrowers and that the costs of doing so are one of the reasons why lending to small businesses is less attractive to some financial institutions).

Public research on small business owners' experience with the lending process is limited but suggests that such issues are important to applicants. Online focus groups of small business owners organized by the Federal Reserve Bank of Cleveland found that participants commonly looked for details on the application process, information required by the lender for the application, and approval requirements/qualifications in addition to details about price and product structure. Participants wanted a clear sense of eligibility requirements and the information that would be required of them during the application process.<sup>93</sup>

### 5.3.2 Concerns regarding data security and sharing

Particularly to the extent that cash-flow based underwriting involves transfers of data between companies who do not already have access to the information, additional concerns about transparency and privacy come into play. While small business transaction data raises fewer concerns about personal privacy than consumer bank account records, there can still be information sensitivities in the small business space. For example, businesses have a strong interest in trying to protect their financial information—particularly account numbers and credentials—from data breaches and misuse. And to the extent that some small business owners may commingle their personal and business transactions in a single bank account, such account data would present heightened privacy concerns relative to purely commercial sources. This is probably more likely to occur with nonemployer businesses than with larger applicants, but statistics are difficult to obtain.<sup>94</sup>

Federal consumer protection laws, particularly the Fair Credit Reporting Act and the Gramm-Leach-Bliley Act, impose various requirements and limitations concerning data use, sharing, and information security for certain types of consumer data. These requirements include substantive limitations, provision of disclosures, and in some cases the use of opt-out procedures concerning certain types of data sharing between nonaffiliated companies.<sup>95</sup> However, GLBA applies only to information that is generated or collected in the course of individuals' obtaining financial products or services which are to be used primarily for personal, family, or household purposes,<sup>96</sup> and as noted above, the FCRA's application to business lending is limited.

Some stakeholders have suggested that California's new Consumer Privacy Act could affect small business lenders with regard to data sharing practices and disclosures because it defines consumer to include any "natural person who is a California resident," without limitation to situations in which the person is engaging in activity for personal, family, or household purposes.<sup>97</sup> The statute

<sup>93</sup> Lipman & Wiersch (2018) at 13, 22, 24. The focus groups involved 42 owners of businesses with between one and twenty employees and less than \$2 million in annual revenues across the U.S. and a wide range of industries. All participants had sought credit for their businesses within the prior 12 months. *Id.* at 1.

<sup>94</sup> Surveys by TD Bank have reported rates of commingling personal and business transactions in a single checking account ranging from 27 percent to 56 percent, but few details about the surveys or the respondents are available. Shubhomita Bose, 27 Percent of Small Business Owners Use Same Bank Account for Business and Personal (Infographic), *Small Business Trends* (Mar. 14, 2017); Jay DesMarteau, A Business-First Banking Mentality Pays for the Small Business Owner, TD Bank (undated); TD Bank, *Entrepreneurs Need a Business-First Banking Mentality*, *globenewswire.com* (Mar. 7, 2014). A 2013 survey of approximately 1000 microbusinesses by the Corporation for Enterprise Development (now Prosperity Now) also found that 51 percent used business checking account products and 23 percent used business saving accounts products, with 19 percent relying at least in part on personal checking, 14 percent on personal savings, and 4 percent on prepaid cards. Reliance on personal products generally declined with the age of the business. Lauren Williams & Kasey Wiedrich, *In Search of Solid Ground: Understanding the Financial Vulnerabilities of Microbusiness Owners*, CFED 28-29 (2014).

<sup>95</sup> 15 U.S.C. §§ 1681-1681x, 12 U.S.C. §§ 6801-6809.

<sup>96</sup> 12 U.S.C. § 6809(4), (9).

<sup>97</sup> Cal. Civ. Code § 1798.140(g). The statute defines "personal information" to include information that identifies, relates to, describes, is capable of being associated with, or could reasonably be linked, directly or indirectly, with a particular consumer or household. *Id.* § 1798.140(o). The statute applies to businesses that "do[] business in the State of the California" if they meet one or more of three thresholds: (1) annual gross revenues above \$25 million; (2) receives the personal information of 50,000 or more consumers, households, or devices on an annual basis; or (3) derives 50 percent or more of its annual revenue from selling consumers' personal information. *Id.* § 1798.140(c).

contains an exception for information that is collected, processed, sold, or disclosed pursuant to GLBA,<sup>98</sup> but as noted above that federal statute does not apply to commercial financial products and services.<sup>99</sup> The California law, which takes effect January 1, 2020, but may not be immediately subject to enforcement, requires covered businesses to provide disclosures about their information collection and processing activities to “consumers,” as well as imposing limitations on various substantive activities.<sup>100</sup>

Again, public research is limited but suggests that business owners are quite concerned about such issues. When the online focus groups organized by the Federal Reserve Bank of Cleveland reviewed mock product descriptions that included a description of what information was required to be provided by applicants—including bank account information that was either pulled electronically or provided by applicants by mail or email—participants repeatedly raised data security and privacy concerns and recommended that steps be taken to ensure the protection of applicants’ personal and business information.<sup>101</sup> Other research sources that are not specific to the financial services context suggest that racial and ethnic minorities and lower-income populations may be particularly concerned about data privacy and security risks.<sup>102</sup>

Thus, both the substance of financial services providers’ information use and security policies and transparency about those policies are important. For small business owners to make informed decisions about authorization of data transfers in the course of applying for credit, several types of information are potentially relevant, including the scope of the data to be collected and transferred, the use to which the data will be put, the identity of the aggregator (if any) that may be effectuating the transfer, whether the lender is seeking permission to make additional data pulls over time, and how the borrower may withdraw consent in the future.

## 5.4 Data ecosystem concerns

A number of stakeholders have expressed concern that further adoption of cash-flow based underwriting could be affected in either positive or negative ways depending on how policy issues are resolved with regard to the new ecosystem that has emerged to transfer bank account and other data between financial institutions as directed by small business or consumer accountholders.

As discussed briefly in Section 4.2, data aggregators report that they can provide coverage for 95 percent of U.S. deposit accounts, yet there are a number of unresolved issues with regard to continuing reliance on credential sharing and screen scraping. While shifting to APIs as the method of transfer may reduce certain risks, it has raised a new set of concerns about scalability and whether banks may be artificially restricting the flow of data for competitive reasons.

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<sup>98</sup> *Id.* § 1798.145(e).

<sup>99</sup> 15 U.S.C. § 6809(9).

<sup>100</sup> See generally Julia B. Jacobson et al., Frequently Asked Questions About the California Consumer Privacy Act of 2018 (CCPA), K&L Gates (July 31, 2018). Enforcement actions by the California Attorney General may not be brought until July 1, 2020, or six months after the issuance of implementing regulations, whichever is earlier.

<sup>101</sup> Lipman & Wiersch (2015) at 17. The focus groups involved 44 owners of businesses with between two and twenty employees and less than \$2 million in annual revenues across the U.S. and a wide range of industries. *Id.* at 2, 17. Participants in later focus groups also expressed concerns about data security, though they noted that traditional companies such as credit bureaus had been hacked. The later focus groups do not appear to have been shown mock descriptions that included information about application requirements. Lipman & Wiersch (2018) at 12, 16-17.

<sup>102</sup> Mary Madden, Privacy, Security and Digital Inequality, Data & Society Research Institute 2-10 (2017) (reporting the results of a 2015 nationally representative survey of 3,000 adults); Mary Madden et al., Privacy, Poverty, and Big Data: A Matrix of Vulnerabilities for Poor Americans, 95 Wash. U.L. Rev. 53 (2017).



To the extent that existing laws and regulatory guidance may address some of these concerns, many of them are limited to the consumer context. For example, the Gramm-Leach-Bliley Act imposes certain protections with regard to information security and transfers, but as discussed above it does not apply to commercial financial products and services.<sup>103</sup> And section 1033 of the Dodd-Frank Act only requires provision of information with regard to “consumer financial products or services” that are provided primarily for personal, family, or household purposes.<sup>104</sup>

These issues not only potentially affect the security, accuracy, and scope of cash-flow data that is available for underwriting small businesses’ credit applications, but also for complementary “use cases” such as financial management platforms that business owners can use to engage with financial services providers for purposes of planning, obtaining advice, and managing their finances on an ongoing basis.<sup>105</sup> Key questions in this regard concern the extent to which small business and consumer account holders are able to define what data is transferred between institutions and to control the use of their data once it has been shared between financial institutions. Information security practices among different actors in the ecosystem are also a concern.

These and related issues are discussed in more depth in the Market Context & Policy Analysis report.

## 5.5 Technology adoption and cost concerns

Finally, technology hurdles and cost considerations may also play a substantial role in determining the further spread of small business underwriting models that rely on cash-flow data, particularly among banks. Even with banks’ existing deposit bases, it can take substantial resources to work with legacy or vendor deposit platforms to establish cost-efficient electronic feeds, validate new underwriting algorithms, and vet third-party service providers in accordance with regulatory guidance. The up-front investments required to make these changes and to secure additional external data sources may appear daunting particularly to smaller institutions.

Operating costs are an area in which platform lenders appear to have substantial advantages over traditional lenders, even though they face higher costs with regard to customer acquisition and cost of funds.<sup>106</sup> Estimates of banks’ operating costs for small business lending vary, but multiple sources suggest that it is these ongoing costs of origination, monitoring, and servicing that have led banks to conclude that small business lending is less profitable than other markets.<sup>107</sup> While the

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**103** 15 U.S.C. § 6809(9).

**104** 12 U.S.C. §§ 5481(5), 5533(a).

**105** Mills, Chapter 9 (discussing the need for better platform and dashboard tools to help small businesses manage their finances and operations).

**106** QED Investors & Oliver Wyman, *The Brave 100: The Battle for Supremacy in Small Business Lending* 19, 24, 27 (2015) (estimating cost of funds for small business lending at 1 percent for banks and 5 to 8 percent for fintech lenders and reporting costs of acquisition of thousands of dollars per loan for some marketplace lenders); American Bankers Association, *The State of Digital Lending* 7 (2018) (estimating operating expenses for lending generally at 6 percent of outstanding loans for banks that use traditional processes, compared to less than 2 percent for non-bank alternative loans); Chris Myers, *For Alternative Lenders To Be Successful, Differentiation Is Key*, *Forbes* (Oct. 15, 2015) (estimating acquisition costs of \$2500 to \$3500 per customer for alternative lenders in general). However, e-commerce and payment processor lenders are situated substantially differently than marketplace platforms as to customer acquisition and cost of funds. See, e.g., QED Investors & Oliver Wyman at 24, 27, 32. For general comparisons of the relative advantages of different types of small business market players in the United States and United Kingdom, respectively, see *id.* at 19-21, 24-29; Deloitte, *Marketplace Lending: A Temporary Phenomenon?* (2016).

**107** Banking Administration Institute, *Making Small Business Loans Profitably* (July 7, 2015) (estimating costs of \$3000 to \$4000 to obtain, set up, and monitor small business loans of \$100,000 or less); QED Investors & Oliver Wyman at 24-26, 28-29 (reporting average cost per new loan for large banks at \$1600 to \$3200); Joe Ganzelli, *Is Small Business Lending Facing a ‘Moment of Reckoning?’*, *gonzobanker* (May 31, 2019) (reporting that some small banks and credit unions continue to structure their origination and monitoring processes for loans below \$100,000 similar to those for larger commercial loans even though it is not cost-effective to do so).

potential to reduce these costs substantially has obvious appeal, forecasting the overall savings from increased predictiveness and processing efficiencies may be challenging. In addition, small business projects must compete for resources against other product lines, and smaller banks may have various challenges in working with the vendors that manage their core platforms more generally.<sup>108</sup> Human capital may also be a limitation for smaller institutions, both in attracting technical expertise and in the expenditure of compliance resources to satisfy regulatory concerns.<sup>109</sup> Non-bank fintech lenders, who are able to attract technical talent more easily and are subject to less regulatory oversight, tend to face fewer challenges in this regard.<sup>110</sup>

In light of these considerations, it is not surprising that many of the cash-flow related initiatives discussed in subsection 4.1 involve partnerships between fintechs and traditional lenders, since such relationships can offer advantages to both sides. Surveys suggest that banks may be substantially more interested in using technology and partnerships to streamline small business lending than consumer lending.<sup>111</sup> However, such partnerships also require business process and technology coordination and compliance investments by banks and their partners under statutes and guidance governing bank service provider relationships.<sup>112</sup> Surveys suggest that technology integration tends to be the greatest source of concern in such partnerships, but that compliance is second.<sup>113</sup> Various stakeholders have indicated that further guidance to clarify applicable requirements and expectations, including the degree to which a partnership makes the non-bank partner subject to specific bank requirements and the obligation of the bank partner to monitor the compliance performance of counterparts, would be helpful to facilitate the partnership process.<sup>114</sup>

**108** For example, most community banks rely on certain companies called “core processors” or “core providers” to operate their deposit platforms. Accordingly, the banks’ ability to form fintech partnerships with other vendors, to customize their own platforms, and even the cost of accessing their own customers’ deposit information for purposes of credit underwriting may depend on the core processors’ facilitation and policies. Telis Demos & Rachel Louise Ensign, *Frustrated by the Tech Industry, Small Banks Start to Rebel*, Wall St. J. (Apr. 11, 2019); Will Hernandez, *Can Core Providers and Small Banks Settle Grievances in 2019?*, American Banker (Dec. 28, 2019); Cheryl Winokur Munk, *How Community Banks Are Innovating from the Core*, Independent Banker (Aug. 1, 2019); American Bankers Association, *Understanding APIs* (2019).

**109** The Financial Brand, *Banking’s Digital Talent Crisis: Who Will Fill the Tech Void?*, thefinancialbrand.com (Jan. 16, 2018); Jim Marous, *Can Community Banks and Credit Unions Survive in Today’s Digital World?*, thefinancialbrand.com (Oct. 19, 2017); Joseph McCafferty, *Compliance Staffing a Key Risk for Banks*, Internal Audit 360° (May 28, 2019). For an analysis of various factors driving compliance challenges relative to bank size generally, see Drew Dahl et al., *Compliance Costs, Economies of Scale, and Compliance Performance: Evidence from a Survey of Community Banks*, Federal Reserve Bank of St. Louis (2018).

**110** Perkins at 12-22; Joe Adler, *Regulatory Concerns Strain Bank-FinTech Relationship*, American Banker (Sept. 25, 2015); Jim Marous, *Banking and Fintech: An Uncommon Partnership*, thefinancialbrand.com (Nov. 30, 2015). However, fintechs face more regulatory oversight when they partner with banks due to their status as third-party service providers. U.S. Treasury Fintech Report at 73-77, 90; Perkins at 21-22.

**111** American Bankers Association (2018) at 7 (reporting that 31 percent of banks surveyed indicated that they would be interested in forming a partnership with a third-party provider to originate and service consumer loans, while 80 percent indicated interest in using technology to support small business lending).

**112** 12 U.S.C. §§ 1867, 5481(26), 5514(e), 5515(d), 5516(e); Federal Deposit Insurance Corporation, *Financial Institution Letter 44-2008* (June 6, 2008); Federal Deposit Insurance Corporation, *Financial Institution Letter 19-2019* (Apr. 2, 2019); Office of the Comptroller of the Currency *Bulletin 2013-29* (Oct. 30, 2013); Board of Governors of the Federal Reserve, *Supervisory & Regulation Letter 13-19* (Dec. 5, 2013); Consumer Financial Protection Bureau *Bulletin 2012-03* (Apr. 13, 2012); Consumer Financial Protection Bureau *Bulletin 2016-2* (Oct. 31, 2016).

**113** American Bankers Association (2018) at 19. Surveys about use of alternative data similarly find that technical hurdles (specifically, developing and testing new risk models) are listed most frequently as a hurdle among financial services providers that are not using such data, but that compliance challenges are the second most frequent barrier listed to adoption. TransUnion, *The State of Alternative Data 16* (2015).

**114** Government Accountability Office at 40-42; U.S. Treasury Fintech Report at 73-77.



## 6. CONCLUSION

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Our research suggests that cash-flow data is helping to transform small business lending by making it faster and cheaper to underwrite. The potential for such data to make small business underwriting substantially more predictive and inclusive as well could have impacts at multiple levels—for individual business owners and their employees, their local communities, various types of financial services providers, and even for the nation’s economy as a whole. Such improvements are particularly important for historically underserved business owners and communities.

As described above, however, additional work would be helpful to assure that such potential is realized. While we believe the results of FinRegLab’s empirical analysis of cash-flow variables and scores used by two small business and four consumer credit providers to be encouraging, additional public research would help regulators, firms, and advocates to develop a deeper understanding of the data’s value and limitations in modelling credit risk. Particularly because new underwriting models using cash-flow data have not yet been tested in economic downturns, additional validation would be helpful.

In addition, there are important policy questions to be addressed as both small business owners and financial services providers work through the implications of greater reliance on these new cash-flow based resources. The most obvious example is the need for careful attention to the potential effects of such data on traditionally underserved populations. However, providing greater transparency with regard to both lending inputs and data practices could also be important to mitigate potential risks for small business applicants and to better position them to obtain the credit that their companies need. And resolving outstanding questions regarding transfers of cash-flow data between companies could help to facilitate both credit underwriting and the development of more sophisticated financial management support services for small businesses.

We believe that these considerations warrant the investment of additional resources into reducing the technological, competitive, and compliance challenges that are slowing adoption of beneficial practices and mitigation of risks in today’s markets. With thoughtful development, cash-flow based underwriting has the potential to become a win-win for borrowers and financial services providers alike.

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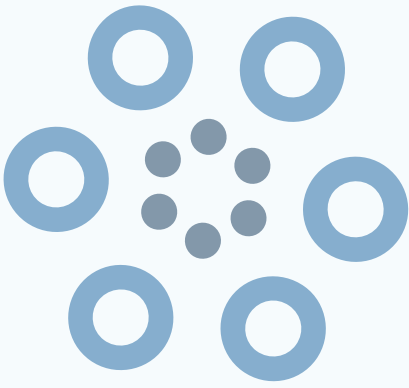
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