



April 2017

FINANCIAL TECHNOLOGY

Information on Subsectors and Regulatory Oversight

Why GAO Did This Study

Advances in technology and the widespread use of the Internet and mobile communication devices have helped fuel the growth in fintech products and services, such as small business financing, student loan refinancing, mobile wallets, virtual currencies, and platforms to connect investors and start-ups. Some fintech products and services offer the potential to expand access to financial services to individuals previously underserved by traditional financial institutions.

GAO was asked to review a number of issues related to the fintech industry, including how fintech products and services are regulated. This report, the first in a series of planned reports on fintech, describes four commonly referenced subsectors of fintech and their regulatory oversight. GAO conducted background research and a literature search of publications from agencies and other knowledgeable parties. GAO also reviewed guidance, final rulemakings, initiatives, and enforcement actions from agencies. GAO interviewed representatives of federal agencies, including the federal prudential regulators, state supervision agencies, trade associations, and other knowledgeable parties.

GAO is making no recommendations in this report.

View GAO-17-361. For more information, contact Lawrence L. Evans at (202) 512-8678 or Evansl@gao.gov

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What GAO Found

The financial technology (fintech) industry is generally described in terms of subsectors that have or are likely to have the greatest impact on financial services, such as credit and payments. Commonly referenced subsectors associated with fintech include marketplace lending, mobile payments, digital wealth management, and distributed ledger technology.

- **Marketplace lenders** connect consumers and small businesses seeking online and timelier access to credit with individuals and institutions seeking profitable lending opportunities. Marketplace lenders use traditional and may use less traditional data and credit algorithms to underwrite consumer loans, small business loans, lines of credit, and other loan products.
- **Mobile payments** allow consumers to use their smartphones or other mobile devices to make purchases and transfer money instead of relying on the physical use of cash, checks, or credit and debit cards. There are different ways to make mobile payments, including the use of a mobile wallet.
- **Digital wealth management platforms** use algorithms based on consumers' data and risk preferences to provide digital services, including investment and financial advice, directly to consumers. Digital wealth management platforms provide services including portfolio selection, asset allocation, account aggregation, and online risk assessments.
- **Distributed ledger technology** was introduced to facilitate the recording and transferring of virtual currencies, specifically using a type of distributed ledger technology, known as blockchain. Distributed ledger technology has the potential to be a secure way of conducting transfers of digital assets in a near real-time basis potentially without the need for an intermediary.

Regulation of these subsectors depends on the extent to which the firms provide a regulated service and the format in which the services are provided. For example, a marketplace lender may be subject to:

- federal regulation and examination by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency in connection with certain services provided to depository institutions by the lender;
- state licensing and regulation in the states in which the lender conducts business;
- securities offering registration requirements administered by the Securities and Exchange Commission if the lender publicly offers securities; and/or
- enforcement actions by the Bureau of Consumer Financial Protection and the Federal Trade Commission for violations of certain consumer protection laws.

To learn about the fintech industry, some agencies hosted forums, formed working groups, and published whitepapers and regulatory guidance.

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Abbreviations

CFPB	Bureau of Consumer Financial Protection known as the Consumer Financial Protection Bureau
CFTC	Commodity Futures Trading Commission
CSBS	Conference of State Bank Supervisors
DLT	distributed ledger technology
FDIC	Federal Deposit Insurance Corporation
Federal Reserve	Board of Governors of the Federal Reserve System
FINRA	Financial Industry Regulatory Authority
FTC	Federal Trade Commission
NCUA	National Credit Union Administration
NMLS	Nationwide Multistate Licensing System
OCC	Office of the Comptroller of the Currency
SBA	Small Business Administration
SEC	Securities and Exchange Commission
Treasury	Department of the Treasury

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE

441 G St. N.W.
Washington, DC 20548

April 19, 2017

The Honorable Sherrod Brown
Ranking Member
Committee on Banking, Housing, and Urban Affairs
United States Senate

The Honorable Jeanne Shaheen
Ranking Member
Committee on Small Business and Entrepreneurship
United States Senate

The Honorable Jeffrey A. Merkley
United States Senate

Advances in technology and the widespread use of the Internet and mobile communication devices have helped fuel the growth in financial technology (fintech) products and services. Consumer access to these new technologies has resulted in changes in their preferences and expectations regarding how they conduct financial transactions, such as using their smartphones to make payments or purchases. Fintech products and services include small business financing, education refinancing, mobile wallets, virtual currencies, and platforms to connect investors and start-ups.

There is no universal definition of fintech. It is also difficult to quantify the size of the industry because data are not separately reported from existing financial services or products' data, and because the industry is constantly evolving. Traditional financial service firms also provide fintech products or services (e.g., existing financial services firms introducing fintech products and services). The fintech industry is generally described in terms of subsectors that have or are likely to have the greatest impact on traditional financial services, such as credit and payments.

You asked us to provide information on the fintech industry, including the marketplace lending subsector, such as its structure and development over the last several years, as well as how federal regulators supervise fintech firms. This report, the first in a series of planned reports on fintech, describes four commonly referenced subsectors of fintech: marketplace lending; mobile payments; digital wealth management; and distributed ledger technology and their regulatory oversight. For each subsector, this

report provides information including what it is and how it works; potential benefits and risks; industry trends; and regulation and oversight.

To identify and describe fintech industry subsectors, we conducted background research and a literature search of publications from agencies, including regulators (agencies), industry groups, and other knowledgeable parties. We also reviewed prior GAO reports on person-to-person lending and virtual currencies.¹ Once we identified commonly referenced subsectors, we conducted interviews with agencies, industry groups, and other knowledgeable parties to identify information for each subsector on what it is and how it works, including potential benefits and risks and industry trends for each subsector. We also attended and summarized fintech-related forums held by federal agencies and others.

To identify the regulation and oversight of the four commonly referenced subsectors, we reviewed publications from federal and state agencies and other knowledgeable parties. We also reviewed prior GAO work on financial regulation.² We reviewed examples of federal laws and regulations related to fintech subsectors. We also reviewed guidance, final rulemakings, initiatives, and enforcement actions from agencies. We interviewed staff from agencies and other knowledgeable officials to obtain information on fintech oversight and regulation at the federal and state levels. To obtain a federal regulatory perspective, we interviewed staff from the federal prudential regulators: the Board of Governors of the Federal Reserve System (Federal Reserve), the Federal Deposit Insurance Corporation (FDIC), the National Credit Union Administration (NCUA), and the Office of the Comptroller of the Currency (OCC), as well as staff from the Commodity Futures Trading Commission (CFTC), Bureau of Consumer Financial Protection, known as the Consumer Financial Protection Bureau (CFPB), Department of the Treasury (Treasury), Federal Trade Commission (FTC), Financial Industry Regulatory Authority (FINRA), Securities and Exchange Commission (SEC), and Small Business Administration (SBA). To obtain a state-level perspective we interviewed representatives of the Conference of State Bank Supervisors (CSBS) and the National Association of State Credit

¹See GAO, *Person-to-Person Lending: New Regulatory Challenges Could Emerge as the Industry Grows*, GAO-11-613 (Washington, D.C.: July 7, 2011); and *Virtual Currencies: Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges*, GAO-14-496 (Washington, D.C.: May 29, 2014).

²GAO, *Financial Regulation: Complex and Fragmented Structure Could be Streamlined to Improve Effectiveness*, GAO-16-175 (Washington, D.C.: Feb. 25, 2016).

Union Supervisors. We also interviewed knowledgeable officials and representatives of trade associations including representatives of the American Bankers Association, Barefoot Innovation Group, Center for Financial Services Innovation, Chamber of Digital Commerce, Electronic Funds Transfer Association, Electronic Transactions Association, Financial Innovation Now, Innovative Lending Platform Association, Marketplace Lending Association, Milken Institute Center for Financial Markets, and Money Transmitter Regulators Association.

We conducted this performance audit from July 2016 to April 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Marketplace Lending

Marketplace lending connects consumers and small businesses seeking online and timelier access to credit with individuals and institutions seeking investment opportunities. Marketplace lenders use traditional and may use less traditional types of data and credit algorithms to assess creditworthiness and underwrite consumer loans, small business loans, lines of credit, and other loan products.

What It Is and How It Works

The marketplace lending subsector originated as person-to-person lending where individual investors financed loans to consumers.³ The investor base for online marketplace lenders has expanded to include institutional investors such as hedge funds and financial institutions. Additionally, there has been the emergence of a market for securitizations of marketplace lending loans—both consumer and small business loan-backed offerings.⁴ Marketplace lending firms have evolved to offer a wide variety of loan products and services to consumers and small businesses and have recently begun to offer mortgages, life insurance, and auto loans. Although a number of marketplace lending models exist,

³See GAO, *Person-to-Person Lending: New Regulatory Challenges Could Emerge as the Industry Grows*, GAO-11-613 (Washington, D.C.: July 7, 2011).

⁴Broadly, securitization is a process whereby lenders and others create pools of loans and sell to investors securities that are backed by cash flows from these loan pools—thereby replenishing funds available for lending.

publications we reviewed highlighted two common models: direct lenders and platform lenders.⁵ Direct lenders, also known as balance sheet lenders, use capital obtained from outside sources to fund loans and often hold loans on their balance sheet. Examples of direct lenders include CAN Capital, Kabbage, and SoFi.⁶ Platform lenders partner with depository institutions to originate loans that are then purchased by the lender or by an investor through the platform. Examples of platform lenders include LendingClub Corporation, Prosper, and Upstart. However, there are various permutations based on these two common models. For example, direct lenders like OnDeck have developed hybrid models, selling some whole loans to institutional investors while retaining servicing responsibilities.

The marketplace lending process for the two models typically begins with a prospective borrower filling out an online application on the marketplace lending platform's website. Marketplace lenders use traditional and may use less traditional types of data and credit algorithms to assess creditworthiness and underwrite loans. Marketplace lenders use traditional credit data (e.g., credit scores, income, and debt repayment history) but, according to publications we reviewed, may also use less traditional data such as monthly cash flow and expenses, educational history, payment and sales history, and online customer reviews.⁷

After assessing the creditworthiness and needs of the applicant, the marketplace lender will approve or deny the borrower's loan request. Generally, the loan will include a principal amount, an interest amount,

⁵Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016; Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016; Alan McQuinn, Weining Guo, and Daniel Castro, *Policy Principles for Fintech*, Information Technology & Innovation Foundation, October 2016; S&P Global Market Intelligence, *An Introduction to Fintech: Key Sectors and Trends*, October 2016; and S&P Global Market Intelligence, *2016 U.S. Digital Lending Landscape* (Charlottesville, Va.: December 2016).

⁶Jackson Mueller, Milken Institute Center for Financial Markets, *U.S. Online, Non-Bank Finance Landscape*, May 2016.

⁷Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016; Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016; SoFi, "SoFi is now officially a "FICO-Free Zone," January 12, 2016, PRNewswire, accessed March 28, 2017, <http://www.prnewswire.com/news-releases/sofi-is-now-officially-a-fico-free-zone-300202822.html>.

and the marketplace lender may charge a servicing fee for collecting and transmitting payments and handling collections in case of a default.

Funding a borrower's request depends on the business model of the marketplace lender. Direct lenders typically originate the loan, hold most or all of the loans on their own balance sheets, earn interest on the loans, and carry credit risk for the entire loan (the risk is that the borrower does not repay), see figure 1. These lenders can raise funds to make loans by issuing equity to institutional investors (in addition to other means).

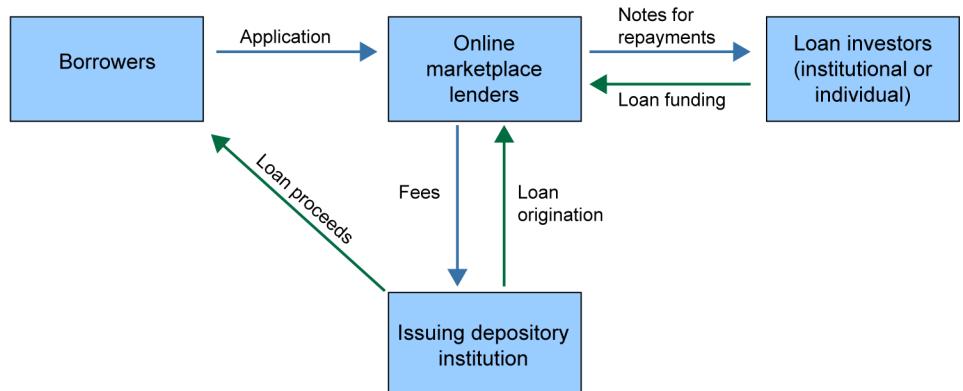
Platform lenders match investors (institutional or individual) to loans that a depository institution, such as a bank, originates (see fig. 2). If the loan is made and transferred to investors, the platform lender services the account. Investors have the option of either partially or fully funding a loan.

Figure 1: Example of a Direct Lender Model



Sources: GAO analysis of Congressional Research Service and Department of the Treasury information. | GAO-17-361

Figure 2: Example of a Platform Lender Model



Sources: GAO analysis of Congressional Research Service and Department of the Treasury information. | GAO-17-361

Who Uses It

Consumers: can use term loans from marketplace lenders to cover personal expenses (such as home or medical expenses); consolidate debt; or refinance student loans, among other reasons. According to Treasury, three marketplace lenders offer consumer loans ranging from

\$1,000 to \$40,000.⁸ Treasury also indicated that marketplace lending firms generally provide consumer loans to prime and near-prime borrowers although some marketplace lending firms target subprime borrowers or applicants without credit scores or with a limited credit history.⁹

Small Businesses: can use short and fixed-term loans, lines of credit, and merchant cash advances from marketplace lenders, among other products and services, to finance business expenses and expansions, among other reasons. According to a Federal Reserve Bank of Cleveland publication, limited data are available about the types of small businesses that use online lenders, why they have chosen to apply, how successful they are in obtaining funds, and how satisfied they are with their experiences as borrowers.¹⁰

Potential Benefits

Lower costs: Marketplace lenders' online structure may reduce overhead costs because not all firms have brick-and-mortar locations. In addition, the algorithms used by marketplace lenders to underwrite credit decisions may result in lower underwriting costs when compared to banks' underwriting costs.

Expanded access to credit: Marketplace lending may expand credit access to underserved populations that may not meet traditional lending requirements or that seek smaller loans than those that banks traditionally offer.¹¹

⁸Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

⁹A credit score is a numeric value ranging from 300 to 850 (calculated based on credit reports from the national credit bureaus) that indicates a borrower's ability to repay future obligations. Although the categories are not rigidly defined, higher credit scores are considered prime, whereas lower credit scores are considered "near prime" or subprime.

¹⁰Federal Reserve Bank of Cleveland, *Click, Submit: New Insights on Online Lender Applicants from the Small Business Credit Survey* (Cleveland, Ohio: Oct. 12, 2016). This publication serves to address knowledge gaps in small business lending and the analysis draws from data in the Federal Reserve's 2015 Small Business Credit Survey.

¹¹Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016; Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

Faster service: According to Treasury, marketplace lenders can provide funding decisions within 48 to 72 hours from when applications are submitted.¹² According to an SBA Office of Advocacy publication, LendingClub Corporation advertises that potential applicants can receive a quote within minutes and that its approval and funding process typically takes 7 days, Kabbage Inc. can provide same-day approval for small business loans, and OnDeck can provide funding within 24 hours.¹³ According to representatives from one industry organization we spoke with, faster service is beneficial to small businesses that may need quick access to credit in an emergency, such as a restaurant that needs its oven or refrigerator repaired to continue operations.

¹²Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

¹³Miriam Segal, Small Business Administration Office of Advocacy, *Peer-to-Peer Lending: A Financing Alternative for Small Businesses*, Issue Brief Number 10 (Washington, D.C.: Sept. 10, 2015). Kabbage, Inc. is an example of a current small business marketplace lender.

Potential Risks

Payment term transparency: Marketplace lending firms offer various loan types and terms, particularly for small business loans. It can be difficult for small businesses to understand and compare loan terms such as the total cost of capital or the annual percentage rate.¹⁴ According to a Federal Reserve 2015 survey, one reason for small business lenders' dissatisfaction with online lenders was a lack of transparency.¹⁵

Small business borrower protections: Current federal laws and regulations applicable to marketplace lending generally apply to consumer loans and not small business loans or other commercial loans.¹⁶ For example, the Truth in Lending Act, which among other things, requires the lender to show the cost and terms to the borrower, applies to consumer loans but generally not small business loans.¹⁷ According to Treasury, small business loans under \$100,000 share common characteristics with consumer loans, yet do not receive the same protections. However, the report also notes that small business loans may receive protection under the enforcement of fair lending laws under the Equal Credit Opportunity Act.¹⁸

Use of less traditional data in credit decisions: Unlike traditional lending companies that look at a person's credit reports (which include reported installment credit and revolving credit), publications we reviewed indicate that some marketplace lenders also take into account or have considered using less traditional data (e.g., utilities, rent, telephone bills, educational

¹⁴The total cost of capital generally includes all interest, loan fees, and any other fees that are a condition of receiving capital. The total cost of capital metric states the total dollar cost of the finance option. The annual percentage rate (APR) provides the cost of capital—including fees that are a condition of receiving capital, when applicable—expressed as a yearly rate. While APR can be used for comparison purposes, it is not the interest rate applied or used to calculate the total dollar cost of a finance option. For more information, see <http://innovativelending.org/smart-box-model-disclosure-depth/>.

¹⁵Federal Reserve Bank of Cleveland, *Click, Submit: New Insights on Online Lender Applications from the Small Business Credit Survey* (Cleveland, Ohio: Oct. 12, 2016). Other reasons for dissatisfaction included high interest rates and unfavorable repayment terms.

¹⁶Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016; and Karen Gordon Mills and Brayden McCarthy, *The State of Small Business Lending: Innovation and Technology and the Implications for Regulation*, working paper 17-042 (Cambridge, Mass.: Harvard Business School, 2016).

¹⁷12 C.F.R. § 226.1;12 C.F.R. § 1026.1.

¹⁸Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

history) during the underwriting process.¹⁹ However, according to Treasury, data-driven algorithms used by marketplace lenders carry the risk for potential fair lending violations.²⁰ According to staff from FTC, marketplace lenders must ensure that their practices meet fair lending and credit reporting laws.²¹ The use of less traditional data also introduces the risk that the data used are inaccurate and concerns that consumers may not have sufficient recourse if the information being used is incorrect.

Uncertainty about performance in full credit cycle: According to publications we reviewed, the marketplace lending subsector experienced considerable growth following the 2007-2009 economic downturn in an environment with tightened lending standards and low interest rates.²² In addition, little is known about how the industry will perform in other economic conditions such as a recession, which could lead to delinquency and defaults of marketplace loans.²³ According to the Congressional Research Service (CRS), it is also possible that loan servicing could be disrupted in the event the marketplace lender goes out of business.²⁴

Industry Trends

Partnerships: According to Treasury, some marketplace lenders have sought partnerships with traditional banks and community development

¹⁹Consumer Financial Protection Bureau, Request for Information Regarding Use of Alternative Data and Modeling Techniques in the Credit Process, http://files.consumerfinance.gov/f/documents/20170214_cfpb_Alt-Data-RFI.pdf.

²⁰Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

²¹Federal Trade Commission, *Fintech Forum: A closer look at marketplace lending*, <https://www.ftc.govnews-events/blogs/business-blog/2016/08/fintech-forum-closer-look-marketplace-lending>.

²²Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016; Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

²³Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016.

²⁴Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016.

financial institutions (CDFI) in various models.²⁵ According to a CRS report, in a white label partnership, a traditional bank sets underwriting standards, originates the loan, and holds the loan once issued.²⁶ The bank can integrate a marketplace lending firm's technology services to originate the loan. For example, JPMorgan Chase & Co. partnered with OnDeck to offer small business loans to JPMorgan Chase & Co. customers.²⁷ In referral partnerships, banks refer customers who do not meet a bank's underwriting standards, or who are seeking products the bank does not offer, to a marketplace lender. In turn, the bank may collect a fee from the marketplace lender. Referrals may also allow CDFIs to reach customers that may otherwise not be served. For example, in 2015, Regions Bank, Fundation Group LLC (an online small business marketplace lender), and TruFund (a CDFI) partnered to provide small loans to underserved small businesses.²⁸

Self-regulatory efforts: A number of self-regulatory marketplace lending efforts were established with the intent of developing responsible innovation and mitigating and reporting risks to potential borrowers seeking marketplace lending products. However, limited information is available on the impact of these efforts. Four examples are discussed below.

- The Marketplace Lending Association (MLA) was established in April 2016 to represent the marketplace lending industry. MLA states that one of its goals is to support responsible growth in the marketplace lending sector.²⁹

²⁵CDFI certifications are issued by Treasury to financial institutions serving economically distressed communities and low-income people across the country. CDFI certification allows financial institutions to apply for technical assistance and financial assistance awards, as well as training provided by the CDFI Fund.

²⁶Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016.

²⁷Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

²⁸See <http://ir.regions.com/releasedetail.cfm?ReleaseID=989068>.

²⁹See <http://www.marketplacelendingassociation.org>.

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- The Online Lenders Alliance represents firms offering loans online. The Alliance provides resources including a consumer hotline, a portal to report fraud, and consumer tips.³⁰
 - In 2016, three small business lending platforms formed the Innovative Lending Platform Association. The Association developed the Straightforward Metrics Around Rate and Total cost (SMART) Box tool to help small businesses understand and assess the cost of their small business finance options. For example, some metrics described in the SMART Box tool include total cost of capital, annual percentage rate calculations, and average monthly payment amounts. Its goal is to include clear and consistent pricing metrics, metric calculations, and metric explanations to help small businesses understand and assess the costs of their small business finance options.³¹
 - In 2015, the Responsible Business Lending Coalition launched the Small Business Borrowers Bill of Rights to foster greater transparency and accountability across the small business lending sector.³²

Regulation and Oversight

The regulation of marketplace lenders is largely determined by the lenders' business model and the borrower or loan type. For example, marketplace lenders that provide services through an arrangement with a federally regulated depository institution may be subject to examination

³⁰See <http://onlinelendersalliance.org>.

³¹See <http://innovativelending.org/smart-box/>.

³²See <http://www.responsiblebusinesslending.org>.

as a third-party service provider by the federal prudential regulator.³³ The federal prudential regulators have provided third-party guidance or vendor risk management guidance to depository institutions that describes the risk assessment, due diligence and risk monitoring, and oversight that depository institutions should engage in when they deal with third parties, including marketplace lenders.³⁴

Depending on the facts and circumstances, including the type of activities being performed, marketplace lenders may be subject to federal consumer protection laws enforced by CFPB and FTC. Also, CFPB and FTC maintain databases of consumer complaints. In March 2016, CFPB

³³The four federal prudential regulators are the Federal Deposit Insurance Corporation (FDIC), the Board of Governors of the Federal Reserve System (Federal Reserve), the National Credit Union Administration (NCUA), and the Office of the Comptroller of the Currency (OCC). The Bank Service Company Act authorizes FDIC, Federal Reserve, and OCC to examine and regulate certain services provided by third parties to insured depository institutions to the same extent as if the activities were performed by the financial institution itself. That act does not however reach NCUA, nor does the Federal Credit Union Act provide comparable authority. Previously, we have asked Congress to consider granting NCUA with this authority, but no actions have been taken to date. See GAO, *Cybersecurity: Bank and Other Depository Regulators Need Better Data Analytics and Depository Institutions Want More Usable Threat Information*, GAO-15-509 (Washington, D.C.: July 2, 2015). According to representatives from NCUA, NCUA's ability to influence compliance is limited to working with credit unions engaging with fintech payment providers to ensure that the institutions monitor the risks of these relationships. According to representatives of the National Association of State Credit Union Supervisors, state regulators have varying authority over third-party service providers that provide services to state-licensed credit unions. In such capacity however, state credit union regulators will generally only be reviewing the third party in the context of safety and soundness and the compliance of the credit union clients.

³⁴For example, OCC's *Third-Party Relationships Risk Management Guidance* says that a bank should adopt risk management processes commensurate with the level of risk and complexity of its third-party relations and ensure comprehensive risk management and oversight of third-party relationships involving critical activities, through the life-cycle of the relationship. Office of the Comptroller of the Currency, *Third-Party Relationships*, OCC Bulletin 2013-29 (Washington, D.C.: Oct. 30, 2013). FDIC's *Guidance for Managing Third-Party Risk* provides four main elements of an effective third-party risk management process: (1) risk assessment, (2) due diligence in selecting a third party, (3) contract structuring and review, and (4) oversight. Federal Deposit Insurance Corporation Financial Institution Letters 44-2008, *Guidance For Managing Third-Party Risk* (Washington, D.C.: June 6, 2008). In July 2016, FDIC proposed third-party lending guidance that outlines the risks that may be associated with third-party lending as well as the expectations for a risk-management program, supervisory considerations, and examination procedures related to third-party lending. The draft guidance supplements and expands on previously issued guidance and would apply to all FDIC-supervised institutions that engage in third-party lending programs. NCUA issued guidance to the credit union industry related to indirect and third-party partnerships or relationships, for example, see 10-CU-15 Indirect Lending and Appropriate Due Diligence.

announced it would begin accepting consumer complaints about marketplace lenders.³⁵ However, according to CFPB staff, CFPB's complaint system does not specifically categorize complaints for marketplace lending because consumers may not know whether to categorize those services as such. FTC encourages consumers to file a complaint if they believe they have been the victim of fraud, identity theft, or other unfair or deceptive business practices. According to FTC staff, fintech is not a category within FTC's consumer complaint database and marketplace lending complaints are generally categorized as consumer loan complaints.

As previously discussed, certain regulations generally apply to consumer loans but may not apply to small business loans or other commercial loans. However, FTC has authority under Section 5 of the Federal Trade Commission Act to protect, among others, small businesses that are consumers of marketplace lending products or services from unfair or deceptive business acts or practices.³⁶

At the federal level, we previously noted that SEC regulates the offer and sale of securities to investors through disclosure requirements and antifraud provisions that can be used to hold companies liable for providing false or misleading information to investors.³⁷ The Securities Act of 1933 generally requires issuers that make a public offering of securities to register the offer and sale of their securities with SEC and provide investors with disclosures that include information about the company issuing securities such as risk factors and financial information.³⁸ According to staff from SEC, certain transactions by marketplace lenders may be exempt from the registration requirements of the Securities Act of 1933 depending on the particular facts of their securities offerings.³⁹ At the state level, state securities regulators are generally responsible for registering certain securities products and, along

³⁵Consumer Financial Protection Bureau, Press Release, "CFPB Now Accepting Complaints on Consumer Loans from Online Marketplace Lender," <https://www.consumerfinance.gov/about-us/newsroom/cfpb-now-accepting-complaints-on-consumer-loans-from-online-marketplace-lender/>.

³⁶15 U.S.C. § 45.

³⁷GAO-11-613.

³⁸15 U.S.C. §§ 77e, 77f, 77g.

³⁹15 U.S.C. § 77d.

with SEC, investigating securities fraud.⁴⁰ Table 1 provides examples of federal laws and regulations relevant to marketplace lending.

⁴⁰ GAO-11-613.

Table 1: Examples of Federal Laws and Regulations Relevant to Marketplace Lending

Law or regulation	Example of relevant requirements or provisions	Federal agencies with regulatory or enforcement authority
Bank Service Company Act	Provides the federal banking agencies with the authority to regulate and examine the performance of certain services by a third-party service provider for a depository institution (or for any subsidiary or affiliate of a depository institution that is subject to examination by that agency) “to the same extent as if such services were being performed by the depository institution itself on its own premises.”	FRS, OCC, FDIC
Electronic Fund Transfer Act (Regulation E)	Provides certain consumer rights regarding the electronic transfer of funds to and from consumers’ bank accounts. Requires disclosure of terms and conditions of electronic transfers, limits consumer liability for unauthorized transfers, and establishes procedures for preauthorizing transfers and error resolution procedures. ^a	OCC, FRS, FDIC, NCUA, FTC, CFPB
Equal Credit Opportunity Act (Regulation B)	Prohibits creditors from discriminating against credit applicants with respect to any aspect of a credit transaction on the basis of race, color, religion, national origin, sex or marital status, or age, or the fact that all or part of the applicant’s income derives from any public assistance program or the fact that the applicant has in good faith exercised any right under the federal Consumer Credit Protection Act or any applicable state law. Authorizes disparate treatment and disparate impact claims. Requires creditors to provide borrowers with notice of any action taken on their application for credit.	OCC, FRS, FDIC, NCUA, FTC, CFPB, SEC
Fair Credit Reporting Act (Regulation V)	Requires a permissible purpose to obtain a consumer credit report, and requires persons to report information to credit bureaus accurately; imposes disclosure requirements on creditors who take adverse action on credit applications based on information contained in a credit report; requires creditors to develop and implement an identity theft prevention program.	OCC, FRS, FDIC, NCUA, SEC, FTC, CFPB
Truth in Lending Act (Regulation Z)	Requires creditors to provide meaningful disclosures concerning certain terms and conditions of certain loan and credit transactions with consumers; intended to help consumers understand the cost of credit and compare credit options. ^a	CFPB, FRS, OCC, NCUA, FDIC, FTC
Investment Advisers Act of 1940	Persons that engage, for compensation, in the business of advising others as to matters involving securities meet the definition of investment adviser under the Investment Advisers Act. The Investment Advisers Act of 1940 and rules thereunder require investment advisers to meet recordkeeping, custodial, reporting and other regulatory responsibilities.	SEC
Securities Act of 1933 (Public Offerings and Private Offerings)	Public Offerings: Online marketplace lenders engaged in the public offering of securities are required to register the securities offerings with SEC, unless the securities or offerings are exempt from the registration requirements of the Securities Act of 1933. Private Offerings: Online marketplace lenders may engage in private offerings of their securities, including offerings made in reliance on the safe harbors in Regulation D.	SEC

Law or regulation	Example of relevant requirements or provisions	Federal agencies with regulatory or enforcement authority
UDAAP	Prohibits unfair, deceptive, or abusive acts or practices (UDAAP).	CFPB, FRS, FDIC, OCC, NCUA
Section 5 of the Federal Trade Commission Act	Prohibits unfair or deceptive acts or practices (UDAP).	FTC, FRS, FDIC, OCC, NCUA
Title V of the Gramm-Leach-Bliley Financial Modernization Act (Regulation P)	Limits when a financial institution may disclose a consumer's "nonpublic personal information" to nonaffiliated third parties; requires financial institutions to notify their customers about their information-sharing practices and to tell consumers of their right to "opt out" if they do not want their information shared with certain nonaffiliated third parties.	FTC, CFPB, FRS, FDIC, OCC, NCUA

Legend

CFPB – Bureau of Consumer Financial Protection, known as the Consumer Financial Protection Bureau

FDIC – Federal Deposit Insurance Corporation

FRS – Board of Governors of the Federal Reserve System

FTC – Federal Trade Commission

NCUA – National Credit Union Administration

OCC – Office of the Comptroller of the Currency

Source: GAO and Department of the Treasury information. | GAO-17-361

Note: This table is not exhaustive, and other federal laws and regulations may apply.

³Additional requirements will become effective at a later date, including comprehensive consumer protection for prepaid accounts under Regulation E, implementing the Electronic Fund Transfer Act, and Regulation Z, implementing the Truth in Lending Act. Prepaid Accounts Under the Electronic Fund Transfer Act (Regulation E) and the Truth in Lending Act (Regulation Z), 81 Fed. Reg. 83934 (Nov. 22, 2016). CFPB issued a proposed rule in March 2017 to delay the effective date of these provisions an additional six months until April 2018. 82 Fed. Reg. 13782 (March 15, 2017).

Marketplace lenders are subject to state-level laws in each state in which they are licensed to conduct business.⁴¹ Specifically, some marketplace lenders that originate loans directly to consumers or businesses (e.g., a direct marketplace lender) are generally required to obtain licenses and register in each state in which they provide lending services.⁴² According to officials from CSBS, state regulators then have the ability to supervise these lenders, ensuring that the lender is complying with state and federal lending laws. CSBS officials noted that the states leverage the Nationwide Multistate Licensing System (NMLS) to facilitate compliance with state-by-state licensing mechanisms.⁴³ NMLS is intended

⁴¹Congressional Research Service, *Marketplace Lending: Fintech in Consumer and Small-Business Lending*, September 6, 2016.

⁴²Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

⁴³NMLS was originally developed as a voluntary system for state licensing and then became mandatory for mortgage licensing in the Secure and Fair Enforcement for Mortgage Licensing Act of 2008, which was part of the Housing and Economic Recovery Act of 2008. Pub. L. No. 110-289, Title V, 122 Stat. 2654, 2810 (2008).

to enable firms to complete one record to apply for state licensing that fulfills the requirements of each state, for states that participate in the system.

Some agencies have taken a number of steps to understand and monitor the fintech industry, including the marketplace lending subsector. For example, in May 2016, Treasury issued a whitepaper on marketplace lending.⁴⁴ In November 2016, SEC hosted a fintech forum where industry representatives and regulators discussed capital formation (including marketplace lending and crowdfunding) and related investor protections.⁴⁵ On December 2, 2016, the Comptroller of the Currency announced intent to make special-purpose national bank charters available to fintech companies, such as marketplace lenders. OCC published a paper discussing issues related to chartering special-purpose national banks and solicited public comment to help inform its path moving forward.⁴⁶ OCC plans to evaluate prospective applicants' reasonable chance of success, appropriate risk management, effective consumer protection, fair treatment and access, and capital and liquidity position.

⁴⁴Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016.

⁴⁵Crowdfunding generally refers to a financing method in which money is raised through soliciting relatively small contributions from a large number of individuals. According to SEC staff, SEC has promulgated Regulation Crowdfunding, which provides an exemption from registration for certain crowdfunding transactions involving securities.

⁴⁶Office of the Comptroller of the Currency, *Exploring Special Purpose National Bank Charters for Fintech Companies* (Washington, D.C.: December 2016). In March 2017, OCC published a draft supplement to its existing licensing manual which outlines the way it will apply existing licensing standards and requirements in its policies to fintech companies that apply for charters. OCC said it will accept comments on the draft through April 14, 2017. For more information, see Office of the Comptroller of the Currency, *OCC Summary of Comments and Explanatory Statement: Special Purpose National Bank Charters for Financial Technology Companies* (Washington, D.C.: March 2017); and Office of the Comptroller of the Currency, *Comptroller's Licensing Manual Draft Supplement, Evaluating Charter Applications from Financial Technology Companies* (Washington, D.C.: March 2017).

Mobile Payments

Mobile payments allow consumers to use their smartphones or other mobile devices to make purchases and transfer money.⁴⁷ Consumers and businesses use these devices to make and receive payments instead of relying on the physical use of cash, checks, or credit and debit cards.

What It Is and How It Works

According to publications we reviewed, there are different ways to make mobile payments, including the use of a mobile wallet. Mobile wallets are electronic versions of consumers' wallets that offer consumers the convenience of faster transactions without having to enter credit or debit card information for each transaction.⁴⁸ Using a mobile wallet, consumers can store payment card information and other information on their mobile devices that is often needed to complete a payment for later use.⁴⁹ Generally, mobile wallets replace sensitive information with randomly-generated numbers—a process called tokenization—that provides greater security when making a payment, and then transmit this information using existing credit and debit card networks.⁵⁰ A variety of companies provide mobile wallets, including Apple, Google, and Samsung; merchants such as Starbucks, Walmart, and CVS; and financial institutions such as JPMorgan Chase & Co. and Citibank. Consumers may use mobile wallets to make payments to other consumers, referred to as person-to-person (P2P) payments, or to businesses, referred to as person-to-business (P2B) payments, either in mobile applications, through mobile browsers, or in person at a store's point-of-sale terminal. In addition, other

⁴⁷This report focuses on macro trends in the mobile payments industry and does not describe all areas of activity in the payments subsector. For example, it does not include mobile payments such as electronic invoicing, remittances, and cross-border payments. This report describes some retail payment methods that involve transactions between two consumers and consumers and businesses. Other retail payment methods include those between businesses but are not discussed in this report. These retail methods are common areas of payment innovations. We have forthcoming work on the payments industry.

⁴⁸Federal Deposit Insurance Corporation Supervisory Insights, *Mobile Payments*, Winter 2012; Federal Trade Commission Staff Report, *Paper, Plastic...or Mobile? An FTC Workshop on Mobile Payments*, March 2013; and Alan McQuinn, Weining Guo, and Daniel Castro, *Policy Principles for Fintech*, Information Technology & Innovation Foundation, October 2016.

⁴⁹In a mobile wallet, consumers can enter payment information from debit and credit cards, gift cards, and prepaid cards. Consumers can also store other information often needed to complete a payment, such as shipping address, e-mail, and phone number.

⁵⁰Marianne Crowe, Susan Pandy, David Lott, and Steve Mott, *Is Payment Tokenization Ready for Primetime? Perspectives from Industry Stakeholders on the Tokenization Landscape*, Federal Reserve Bank of Atlanta and Federal Reserve Bank of Boston, June 11, 2015.

providers, such as Paypal or Venmo, allow individuals to create accounts to receive and make payments.

P2P payments: Consumers can transfer value from a bank account (checking or savings), stored funds in a mobile wallet, credit/debit card, or prepaid card to another consumer's account. P2P methods use the Internet, mobile applications, or text messages and generally move funds through the automated clearing house (ACH) network or debit and credit card networks.⁵¹ A variety of fintech firms provide P2P services. For example, current P2P providers include PayPal, Venmo, and Google; social networks such as Facebook and Snapchat; and financial institutions such as Bank of America Corporation and JPMorgan Chase & Co.⁵²

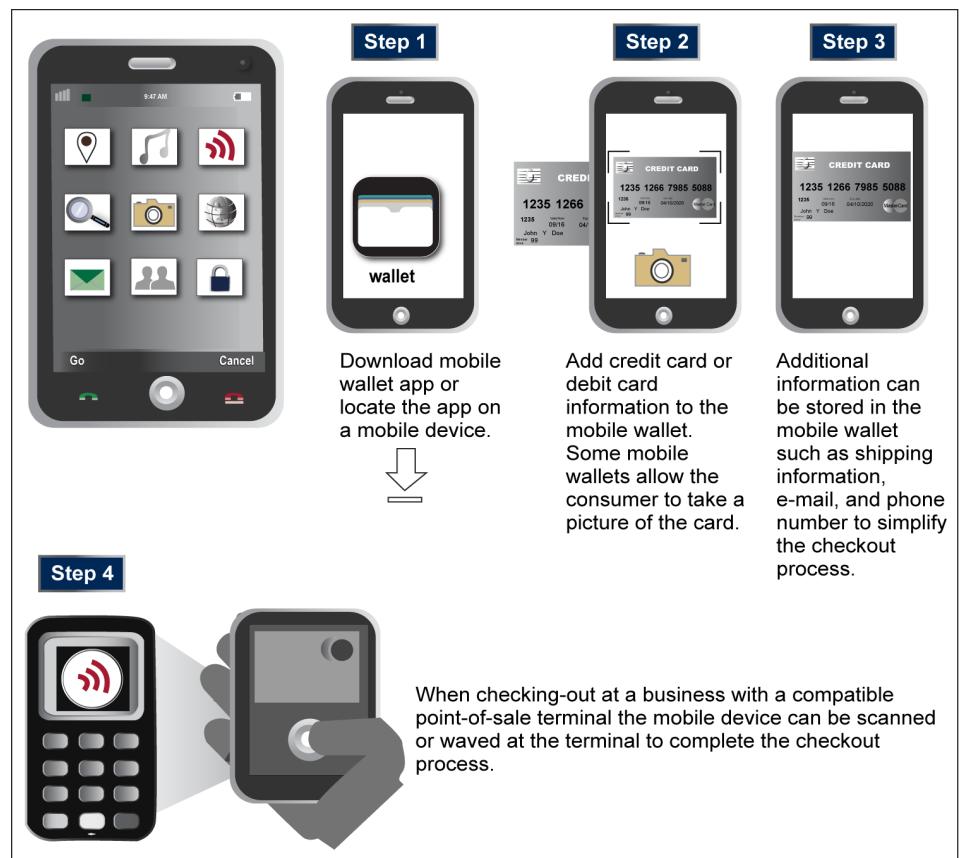
P2B payments: Consumers can also use their mobile devices to make payments to businesses in stores or on their mobile device. In stores, consumers can use mobile wallets to pay a business for goods or services at compatible point-of-sale terminals. These transactions rely on various technologies to transfer payment data between the consumer's mobile device and the business, including quick response (QR) codes and wireless communication technologies that enable the payment information to be transferred by allowing compatible devices to exchange data when placed in very close proximity to each other (see fig. 3).⁵³

⁵¹The ACH network is a system that processes payments on a batched basis, governed by a specific set of rules that provide for the interbank clearing of electronic debit and credit entries for participating institutions. Both the Federal Reserve System and the private sector provide ACH services. See GAO, *Payment Services: Federal Reserve's Competition with Other Providers Benefits Customers, but Additional Reviews Could Increase Assurance of Cost Accuracy*, GAO-16-614 (Washington, D.C.: Aug. 30, 2016).

⁵²These financial institutions, among others, are part of a network for customers to send and receive payments.

⁵³QR codes are a two-dimensional form of barcode whose contents can be decoded electronically at high speed. Wireless communication technologies include Near Field Communications (NFC) technology, a standards-based wireless communication technology that allows data to be exchanged between devices that are a few centimeters apart, among others.

Figure 3: How Mobile Wallets Work in Stores



Source: GAO. | GAO-17-361

Who Uses It

The Federal Reserve's 2016 report on Consumers and Mobile Financial Services found that of those with a mobile phone in 2015, 30 percent of individuals ages 18 to 29 and 32 percent of individuals ages 30 to 44 made mobile payments.⁵⁴ By comparison, 13 percent of those ages 60 or

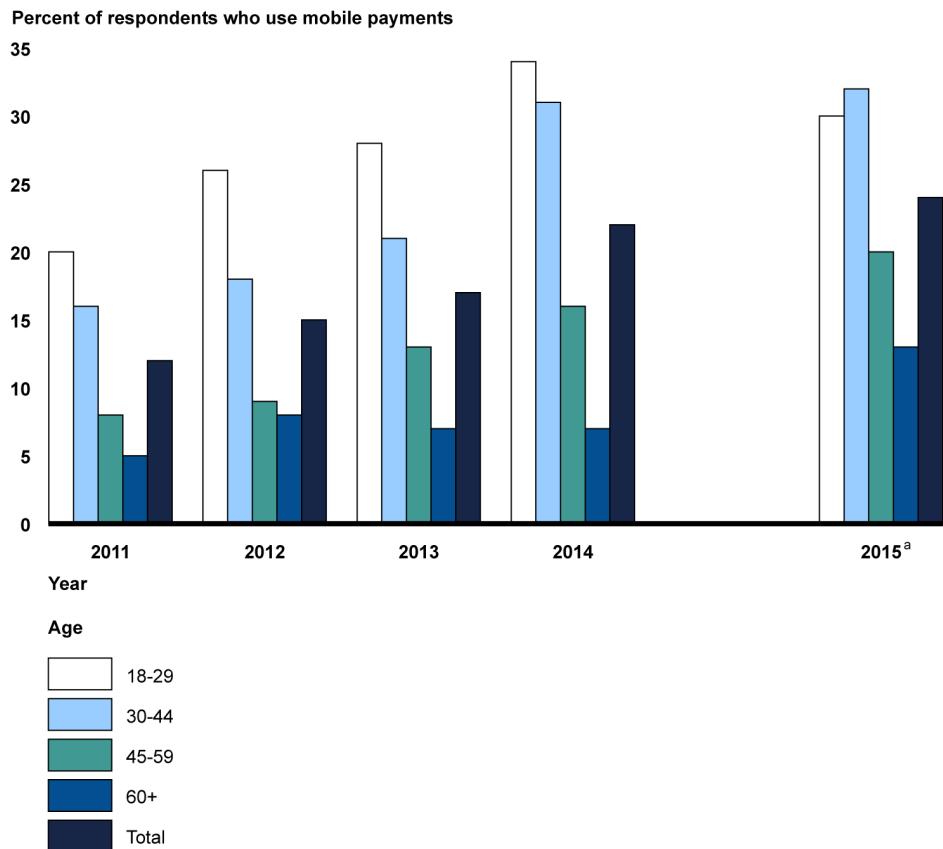
⁵⁴Board of Governors of the Federal Reserve System, *Consumers and Mobile Financial Services 2016*, March 2016, accessed January 11, 2017, <https://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201603.pdf>. The survey defines mobile payments as “purchases, bill payments, charitable donations, payments to another person, or any other payments made using a mobile phone.” The 2016 report presents findings from the survey conducted in November 2015, which focused on consumers’ use of mobile technology to access financial services and make financial decisions.

over made a mobile payment (see fig. 4).⁵⁵ From 2011 to 2014, the same general trend was true: younger adults were more likely to make a mobile payment than older age groups. However, the survey results are not comparable because the definition of mobile payments was revised for the 2015 survey.⁵⁶

⁵⁵Board of Governors of the Federal Reserve System, *Consumers and Mobile Financial Services 2016*, March 2016.

⁵⁶For the 2011 through 2014 surveys, the following definition of mobile payments was provided to respondents: "Mobile payments are purchases, bill payments, charitable donations, payments to another person, or any other payments made using a mobile phone. You can do this either by accessing a web page through the web browser on your mobile device, by sending a text message (SMS), or by using a downloadable application on your mobile device. The amount of the payment may be applied to your phone bill (for example, Red Cross text message donation), charged to your credit card, or withdrawn directly from your bank account." For the 2015 survey, the following definition of mobile payments was provided to respondents: "Mobile payments are purchases, bill payments, charitable donations, payments to another person, or any other payments made using a mobile phone. This includes using your phone to pay for something in a store as well as payments made through an app, a mobile web browser or a text message."

Figure 4: Survey Responses to the Use of Mobile Payments by Age Group, 2011-2014 and 2015



Note: According to the survey, responses are among respondents who own or use a mobile phone.

^a2015 survey results are not directly comparable to prior years because the definition of mobile payments was revised for the 2015 survey.

According to a survey by the Pew Charitable Trusts of over 2,000 consumers, 46 percent of the U.S. population reported having made a mobile payment.⁵⁷ Specifically, 39 percent of mobile payments users

⁵⁷Mobile payment users were defined as consumers who made an online or point-of-sale purchase, paid a bill, or sent or received money using the Internet, text message, or app on a smartphone. Pew Charitable Trusts, *Who Uses Mobile Payments? Survey findings on consumer opinions, experiences*, May 2016.

were millennials and 33 percent were between the ages of 35 and 50 compared to 29 percent of users over the age of 50.

Underbanked: FDIC and the Federal Reserve have found that underbanked consumers use mobile financial services. According to a 2015 survey by FDIC, 20 percent of households in the United States were underbanked, meaning that the household had an account at an insured institution but also obtained financial services and products outside of the banking system.⁵⁸ According to qualitative research conducted by FDIC in 2016, underbanked consumers stated that they used P2P payments and a variety of financial products to manage their day-to-day finances.⁵⁹ The Federal Reserve's 2015 survey indicated that a higher percentage of underbanked consumers used mobile payments than fully banked respondents (34 percent versus 20 percent).⁶⁰

Potential Benefits

Convenience and efficiency: According to publications we reviewed, mobile wallets offer consumers the convenience of instant transactions without having to enter credit card information, PIN numbers, and shipping addresses each time they make a purchase.⁶¹ Mobile wallets

⁵⁸Federal Deposit Insurance Corporation, *2015 FDIC National Survey of Unbanked and Underbanked Households*, October 20, 2016, accessed December 29, 2016, <https://www.fdic.gov/householdsurvey/>. The survey found that between 2013 and 2015, smartphone access increased by 30 percent for unbanked households and by 17 percent for underbanked households.

⁵⁹FDIC defines underbanked as those who have an account but also obtain financial services from nonbank alternative financial services providers such as check cashers or payday lenders. Federal Deposit Insurance Corporation, *Opportunities for Mobile Financial Services to Engage Underserved Consumers Qualitative Research Findings*, May 25, 2016, accessed January 5, 2017, https://www.fdic.gov/consumers/community/mobile/MFS_Qualitative_Research_Report.pdf.

⁶⁰According to the Federal Reserve's 2015 survey, underbanked is defined as having a bank account but also using an alternative financial service (typically from a nonbank provider), including a money order, check-cashing service, tax refund anticipation loan, pawn shop loan, payday loan, auto title loan, or a paycheck advance/deposit advance. In addition, according to the Federal Reserve survey, the list of alternative financial services included in the Federal Reserve's survey differs from those included in FDIC's work on unbanked and underbanked groups, and thus comparability of underbanked figures across the two surveys must be approached with these differences in mind.

⁶¹Board of Governors of the Federal Reserve System, *Consumers and Mobile Financial Services 2014*, March 2014; Alan McQuinn, Weining Guo, and Daniel Castro, *Policy Principles for Fintech*, Information Technology & Innovation Foundation, October 2016; and Krista Becker, *Mobile Phone: The New Way to Pay?* Federal Reserve Bank of Boston Emerging Payments Industry Briefing, February 2007.

can also streamline the checkout time. For example, consumers can wave their smartphone in front of an in-store terminal to make a purchase, which can be faster than swiping a credit or debit card.

Data security: Mobile payments can be protected by various security mechanisms, such as codes that must be entered to access a mobile device.⁶² According to publications we reviewed, mobile wallets may also improve data security by replacing a consumer's payment card information with a randomly generated number, or token.⁶³ Mobile payments can use this token to transact with a merchant, which better protects consumer account credentials.

Potential Risks

Many of the potential risks associated with mobile payments are the same as those that exist with traditional payment products. Some examples of those risks are discussed below.

Data security: Data security risks include the possibility of payment and personal data being lost or vulnerable to theft because of consumers' reliance on the use of smartphones or other mobile communication devices. According to the Federal Reserve's 2015 survey, respondents identified concerns about the security of the technology as one of the main reasons they do not use mobile payments.⁶⁴ Security concerns include the event of a smartphone being hacked, the loss or theft of a smartphone, or if a company does not sufficiently protect mobile transactions, among other concerns.

⁶²Consumer Financial Protection Bureau, *The Consumer Credit Card Market*, December 2015.

⁶³This process is referred to as tokenization. Marianne Crowe, David Lott, Steve Mott, and Susan Pandy, *Is Payment Tokenization Ready for Primetime?* Federal Reserve Bank of Atlanta and Federal Reserve Bank of Boston, June 11, 2015; The Clearing House, *Ensuring the Safety & Security of Payments, Faster Payments Symposium*, August 4, 2015.

⁶⁴Board of Governors of the Federal Reserve System, *Consumers and Mobile Financial Services 2016*, March 2016. Responses from the question, "Which one of the following security aspects are you most concerned with?"

Human error and confusion: According to publications we reviewed, mobile payment methods can create operational risk for human error.⁶⁵ For example, consumers can deposit or send money to the wrong person when using P2P payments (e.g., if they type in the wrong phone number). Mobile payment methods can also increase consumer confusion regarding protections based on the underlying funding source. According to FDIC, consumers may not understand which regulators supervise the parties providing mobile payments and may be unsure which consumer protections apply.⁶⁶

Industry Trends	<p><i>Mobile Payment Activities:</i> According to the Federal Reserve's 2015 survey, the three most common mobile payment activities among mobile payments users with smartphones were paying bills through a mobile phone web browser or app (65 percent), purchasing a physical item or digital content remotely using a mobile phone (42 percent), and paying for something in-store using a mobile phone (33 percent).⁶⁷</p> <p><i>Partnerships:</i> Some industry stakeholders we spoke with said that the relationship between banks and mobile payment firms has changed to more partnerships because banks and mobile payment firms recognize mutual benefits. For example, mobile payment firms can benefit from banks' experience with regulatory compliance and banks can remain competitive by meeting the needs of their customers.</p>
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Regulation and Oversight	The regulatory and oversight framework for mobile payments consists of a variety of federal and state regulation and oversight. Determining which laws apply to mobile payments depends on several factors, including agency jurisdiction, mobile payment providers' relationship to depository institutions, and the type of account used by a consumer to make a mobile payment.
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⁶⁵Federal Deposit Insurance Corporation, Supervisory Insights, *Mobile Payments: An Evolving Landscape*, Winter 2012; Professor Mark E. Budnitz, Pew Charitable Trusts, *The Legal Framework Of Mobile Payments: Gaps, Ambiguities, and Overlap*, February 10, 2016.

⁶⁶Federal Deposit Insurance Corporation, Supervisory Insights, *Mobile Payments: An Evolving Landscape*, Winter 2012.

⁶⁷Board of Governors of the Federal Reserve System, *Consumers and Mobile Financial Services 2016*, March 2016.

Three of the federal prudential regulators—Federal Reserve, FDIC, and OCC—are authorized to examine and regulate the provision of certain services provided by mobile payment providers for federally insured banks and thrifts.⁶⁸ For example, these regulators can examine mobile payment providers that are considered third-party service providers of a regulated depository institution if the payment provider offers services to customers on behalf of a depository institution. The federal prudential regulators can also take enforcement actions against mobile payment providers if the provider is an institution-affiliated party of the bank.⁶⁹

CFPB has consumer protection authority over certain nonbank institutions and enforcement jurisdiction over entities that offer or provide consumer financial products or services.⁷⁰ In October 2016, CFPB issued a final rule to add prepaid cards and some of the payment services that fintech providers are offering, such as PayPal, to the definition of accounts covered under regulations applicable to electronic fund transfer systems such as automated teller machine transfers, telephone bill-payment services, point-of-sale terminal transfers in stores, and preauthorized transfers from or to a consumer's account (such as direct deposit and Social Security payments).⁷¹ According to CFPB staff, the rule is aimed at

⁶⁸As previously discussed in the regulation and oversight of marketplace lending, the fourth federal prudential regulator, NCUA, does not have formal authority over fintech firms that partner with federally insured credit unions.

⁶⁹The Bank Service Company Act gives FDIC, OCC, and the Federal Reserve authority to examine a federally insured bank's third-party service providers to see what risks they impose on the bank. The *Federal Financial Institutions Examination Council Examination Handbook* encourages financial institutions to effectively assess, manage, and monitor risk with respect to third-party mobile financial service providers. The Federal Deposit Insurance Act authorizes the federal banking agencies to take enforcement actions against "institution affiliated parties" which are defined to include independent contractors, which may include third-party service providers. The banking agency must establish that the independent contractor engaged in knowing or reckless misconduct that "caused or is likely to cause more than a minimal financial loss to, or a significant adverse effect on, the insured depository institution." 12 U.S.C. § 1813(u)(4).

⁷⁰CFPB has consumer protection oversight for certain nonbank entities that offer consumer financial products and services and for depository institutions with more than \$10 billion in total assets and their affiliates. CFPB also has rulemaking and interpretive authority for certain federal consumer financial laws relevant to mobile financial services (see table 2).

⁷¹Prepaid Accounts Under the Electronic Fund Transfer Act (Regulation E) and the Truth in Lending Act (Regulation Z), 81 Fed. Reg. 83934 (Nov. 22, 2016). The CFPB director signed the final rule on October 3, 2016. In March 2017, CFPB issued a proposed rule that would delay the effective date of the Prepaid Account rule for six months, until April 1, 2018. 82 Fed. Reg. 13782 (March 15, 2017).

providing wide-ranging protections to consumers holding prepaid accounts. Although this rule largely focuses on prepaid cards, the protections also extend to P2P payments and certain mobile wallets that can store funds.⁷²

Nonbank providers of financial products and services, including mobile payment providers and prepaid card providers, may be subject to FTC consumer protection enforcement actions.⁷³ According to FTC staff, FTC has brought and settled enforcement actions alleging unfair or deceptive conduct by wireless providers providing mobile payment services.

Finally, at the federal level, the Federal Communications Commission (FCC) has jurisdiction over wireless providers, which provide the devices used for mobile payments or sometimes collect such payments through their customers' billing statements.⁷⁴

According to FDIC, to date, no federal laws and regulations specifically govern mobile payments. However, to the extent a mobile payment uses an existing payment method, the laws and regulations that apply to that method also apply to the mobile payment.⁷⁵ Table 2 provides examples of federal laws and regulations relevant to mobile payment transactions.

⁷²The rule also recognizes that some covered products are offered on mobile devices so the agency provides clarity on how to comply with the rule, including the font size for disclosures, on a mobile device.

⁷³CFPB and FTC share joint enforcement jurisdiction over certain nonbank providers of financial products and services, as governed by the Dodd-Frank Act and a memorandum of understanding. "Memorandum of Understanding between the Consumer Financial Protection Bureau and the Federal Trade Commission" (Mar. 6, 2015), <https://www.ftc.gov/policy/cooperation-agreements/ftc-cfpb-interagency-cooperation-agreement>.

⁷⁴FCC is responsible for the Truth-in-Billing rule. Mobile payment products that include wireless bill charges as a payment method may be subject to FCC's authority.

⁷⁵Federal Deposit Insurance Corporation, Supervisory Insights, *Mobile Payments: An Evolving Landscape*, Winter 2012.

Table 2: Examples of Federal Laws and Regulations Relevant to Mobile Payment Transactions

Law or regulation	Example of relevant requirements or provisions	Applicability to mobile payment transactions	Federal agencies with regulatory or enforcement authority
Bank Service Company Act	Provides the federal banking agencies with the authority to regulate and examine the performance of certain services by a third-party service provider for a depository institution (or for any subsidiary or affiliate of a depository institution that is subject to examination by that agency) “to the same extent as if such services were being performed by the depository institution itself on its own premises.”	Applies when a mobile payment provider is a third-party service provider to a depository institution.	FRS, OCC, FDIC
Electronic Fund Transfer Act (Regulation E)	Provides certain consumer rights regarding the electronic transfer of funds to and from consumers’ bank accounts. Requires disclosure of terms and conditions of electronic transfers, limits consumer liability for unauthorized transfers, and establishes procedures for preauthorizing transfers and error resolution procedures. ^a	Applies when the underlying payment is made to or from a consumer’s account via an electronic fund transfer.	OCC, FRS, FDIC, NCUA, FTC, CFPB
Truth in Lending Act (Regulation Z)	Requires creditors to provide meaningful disclosures concerning certain terms and conditions of certain loan and credit transactions with consumers; intended to help consumers understand the cost of credit and compare credit options. ^a	Applies when the underlying source of payment is a credit card (or other credit account covered by the Truth in Lending Act and Regulation Z).	CFPB, FRS, OCC, NCUA, FDIC, FTC
UDAAP	Prohibits unfair, deceptive, or abusive acts or practices (UDAAP).	Applies to all mobile payments regardless of underlying payment source.	CFPB, FRS, FDIC, OCC, NCUA
Section 5 of the Federal Trade Commission Act	Prohibits unfair or deceptive acts or practices (UDAP).	Applies to all mobile payments regardless of underlying payment source.	FTC, FRS, FDIC, OCC, NCUA

Law or regulation	Example of relevant requirements or provisions	Applicability to mobile payment transactions	Federal agencies with regulatory or enforcement authority
Title V of the Gramm-Leach-Bliley Financial Modernization Act (Regulation P)	Limits when a financial institution may disclose a consumer's "nonpublic personal information" to nonaffiliated third parties; requires financial institutions to notify their customers about their information-sharing practices and to tell consumers of their right to "opt out" if they do not want their information shared with certain nonaffiliated third parties.	Applies when a financial institution handles information of a "consumer" or "customer."	FTC, CFPB, FRS, OCC, NCUA, FDIC
Truth in Billing	Requires wireless carriers to provide certain billing information to customers.	Applies when mobile payment results in charges to mobile phone bill.	FCC

Legend

CFPB – Bureau of Consumer Financial Protection, known as the Consumer Financial Protection Bureau

FCC – Federal Communications Commission

FDIC – Federal Deposit Insurance Corporation

FRS – Board of Governors of the Federal Reserve System

FTC – Federal Trade Commission

NCUA – National Credit Union Administration

OCC – Office of the Comptroller of the Currency

Source: GAO and FDIC information. | GAO-17-361

Note: This table is not exhaustive, and other federal laws and regulations may apply.

^aAdditional requirements will become effective at a later date, including comprehensive consumer protections for prepaid accounts under Regulation E, implementing the Electronic Fund Transfer Act, and Regulation Z, implementing the Truth in Lending Act. Prepaid Accounts Under the Electronic Fund Transfer Act (Regulation E) and the Truth in Lending Act (Regulation Z), 81 Fed. Reg. 83934 (Nov. 22, 2016). CFPB issued a proposed rule in March 2017 to extend the effective date of these provisions an additional six months to April 2018. 82 Fed. Reg. 13782 (March 15, 2017).

State regulators also have authority to regulate mobile payment providers. For example, most states have licensing and regulatory authority over money service businesses that provide money transfer services or payment instruments, which can include mobile payment providers. For example, fintech firms such as PayPal and Google Wallet are subject to state money transmitter laws. State regulators have made efforts to make the state licensing process less burdensome by conducting multistate exams and using NMLS to facilitate these processes.⁷⁶

According to interviews with some agencies, they formed working groups to monitor and understand mobile payments. These examples are listed below.

⁷⁶For more information on the multistate exam process, see <https://www.csbs.org/news/presentations/annualreports/Documents/2015%20MMET%20Annual%20Report.pdf>.

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- In January 2010, the Federal Reserve started the Mobile Payments Industry Working Group to facilitate discussions as to how a successful mobile payments (as opposed to mobile banking) system could evolve in the United States.⁷⁷ The working group meets several times annually to share information and ideas. In addition, the Federal Reserve established a multidisciplinary working group focused on analyzing potential innovation in fintech including payments.
 - FDIC established a formal FinTech Steering Committee and two working groups, one focus of one of the working groups includes mobile payments.
 - CFPB met with payment innovators through its Project Catalyst.⁷⁸
 - CSBS formed an Emerging Payments and Innovation Task Force in 2013 to study changes in payment systems to determine the potential impact on consumer protection, state law, and banks and nonbank entities chartered or licensed by the states.⁷⁹

Digital Wealth Management

Digital wealth management platforms, including robo-advisors, use algorithms based on consumers' data and risk preferences to provide digital services, including investment and financial advice, directly to consumers.⁸⁰ Digital wealth management platforms provide services including portfolio selection, asset allocation, banking and account aggregation, and online risk assessments.⁸¹

⁷⁷The group is run by the Federal Reserve Banks of Atlanta and Boston and includes a variety of industry stakeholders. See <https://www.bostonfed.org/publications/mobile-payments-industry-workgroup/mobile-payments-industry-workgroup.aspx> for more information.

⁷⁸In October 2016, CFPB released its first report on Project Catalyst, the project to encourage consumer-friendly innovation in markets for consumer financial products and services, see Consumer Financial Protection Bureau, *Project Catalyst report: Promoting consumer-friendly innovation*, October 2016.

⁷⁹For more information see <https://www.csbs.org/REGULATORY/EP/Pages/default.aspx>.

⁸⁰For purposes of this report, we refer to firms that provide digital wealth management platforms as digital wealth management firms.

⁸¹BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016, <https://www.blackrock.com/corporate/en-at/literature/whitepaper/viewpoint-digital-investment-advice-september-2016.pdf>; Financial Industry Regulatory Authority, *Report on Digital Investment Advice*, March 2016, <http://www.finra.org/sites/default/files/digital-investment-advice-report.pdf>; Gauthier Vincent, Rohit Gera, Deloitte, *Digital Disruption in Wealth Management Why Established Firms Should Pay Attention To Emerging Digital Business Models For Retail Investors*, 2014.

What It Is and How It Works

According to data from SEC, there were over 12,000 SEC-registered investment advisers in 2016.⁸² However, according to staff from SEC, because digital wealth management firms register as investment advisers and are not all separately counted or categorized, the total number of these entities is not known. Digital wealth management firms incorporate technologies into their portfolio management platforms primarily through the use of algorithms designed to optimize wealth management services. Fully automated platforms have features that let investors manage their portfolios without direct human interaction. Examples of current digital wealth management firms include Betterment, Wealthfront, Personal Capital, BlackRock's Future Advisor, and Acorns.

Publications we reviewed indicate that digital wealth management platforms typically collect information on customers and their financial history using online questionnaires.⁸³ These questionnaires may cover topics such as the customer's age, income, investment horizon, risk tolerance, and expected returns, among other information.⁸⁴ Digital wealth management platforms allow customers with a need to connect multiple accounts—often across multiple providers—to create a holistic picture of their wealth and more easily manage their finances across multiple asset classes and firms.⁸⁵ Digital wealth management platforms use the information inputted by the customer to help the customer select a risk profile. The firms then use algorithms to generate a suggested investment strategy to the customer based on that risk profile. Platforms can automatically rebalance customers' portfolios in response to the performance of the underlying investments, and the customers' goals (see fig. 5).

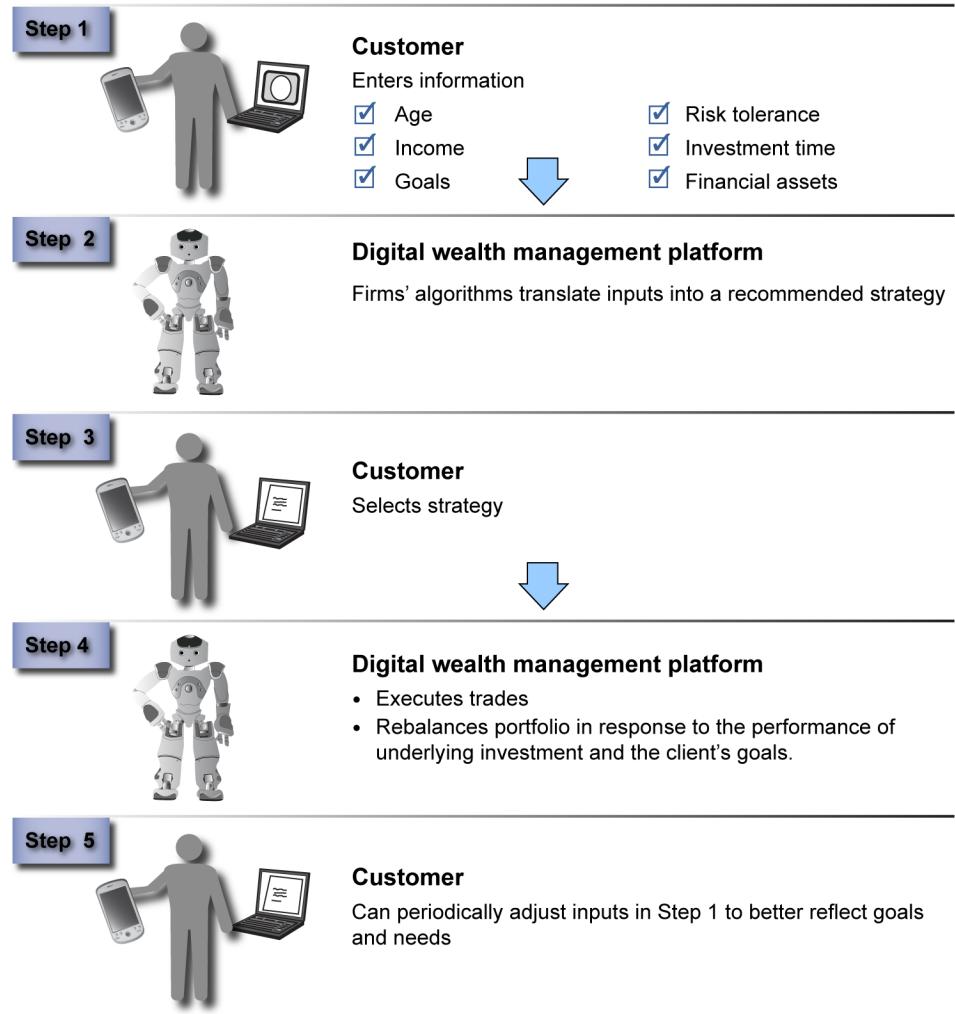
⁸²According to SEC staff, digital wealth management firms typically register with SEC as investment advisers. Advisers qualifying under the SEC rule for Internet investment advisers (Rule 203A-2(e)) report that status on their SEC registration filing. However, the number of Internet investment advisers that file under Rule 201A-2(e) is likely under-inclusive for purposes of identifying digital wealth management firms because some firms may register with SEC on another basis (e.g., because they have over \$100 million in regulatory assets under management), and so may not identify themselves as Internet advisers on their SEC registration filings.

⁸³BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016; Financial Regulatory Authority, *Report on Digital Investment Advice*, March 2016.

⁸⁴BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016; Financial Regulatory Authority, *Report on Digital Investment Advice*, March 2016.

⁸⁵Gauthier Vincent and Rohit Gera, Deloitte, *Digital Disruption in Wealth Management - Why Established Firms Should Pay Attention to Emerging Digital Business Models for Retail Investors*, 2014.

Figure 5: Example of a Digital Wealth Management Platform



Source: GAO analysis. | GAO-17-361

Adviser-assisted digital wealth management platforms combine a digital client portal and investment automation with a virtual financial adviser typically conducting simple financial planning and periodic reviews over the phone. Examples of current platforms in this category include Personal Capital, Future Advisor, and LearnVest. To further differentiate themselves, they may offer value-added services like asset aggregation capabilities that enable the provision of more holistic advice than fully automated digital wealth managers, based on a comprehensive view of

client assets and liabilities, as well as expense-tracking and advice on budgeting and financial-goal planning.⁸⁶

Potential Benefits

Increased access to wealth management services: Publications we reviewed indicated that digital wealth management platforms may expand access to underserved segments such as customers with smaller asset amounts than those of traditional consumers of wealth management services.⁸⁷ For example, some platforms may not require customers to maintain minimum balance amounts. Traditional firms may require minimum investment amounts of \$250,000, whereas some digital platforms require a minimum of approximately \$500 or no minimum at all.⁸⁸

Convenience: Regardless of location or the time of day, investors with a smart phone, tablet, or computer can make changes to their data and preference inputs, send instructions, access their portfolios, and receive updated digital advice.⁸⁹

Lower fees: According to publications we reviewed, digital wealth management platforms may charge lower fees for services such as investment trade fees than traditional wealth management firms.⁹⁰

⁸⁶EY, *Advice Goes Virtual: How new Digital Investment Services Are Changing The Wealth Management Landscape*, 2015.

⁸⁷Deloitte, *Robo Advisors: Capitalizing on a growing opportunity*, 2015; EY, *Advice Goes Virtual: How new Digital Investment Services Are Changing The Wealth Management Landscape*, 2015; Accenture, *The Rise of Robo-Advice: Changing the Concept of Wealth Management*, 2015; BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016.

⁸⁸Bloomberg QuickTake, *Robo-advisors: They Invest by Algorithm But Don't Return Calls*, June 7, 2016, accessed December 14, 2016, <https://www.bloomberg.com/quicktake/robo-advisers>.

⁸⁹According to SEC staff, the instructions inputted into the platform may not be carried out until the relevant markets open. BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016.

⁹⁰Securities and Exchange Commission Office of Investor Education and Advocacy, *Investor Bulletin: Robo-Advisers*, February 23, 2017, https://www.sec.gov/oiea/investor-alerts-bulletins/ib_robo-advisers.html; Qplum, *What is Robo-Advising* (Jersey City, NJ: May 5, 2016).

Potential Risks

Some of the potential risks associated with digital wealth management platforms may be similar to those that exist with traditional wealth management services. Examples of those risks are discussed below.

Insufficient or incomplete information from customers: According to publications we reviewed, some digital wealth management platforms generate investment outputs based on information provided by the client from questionnaire responses.⁹¹ A traditional wealth manager is able to ask and clarify questions and request follow-up information to capture a customer's full finances and goals. However, automated responses may not allow the platform to capture a full picture of the customer's circumstances or short-term goals, for example, whether the customer may need investment money to buy a new home. If the customer does not understand a question, or does not answer it completely, the platform may not assess customers' full financial circumstances; for example, if a customer provides conflicting information on his or her finances, the digital wealth management platform may not have a full picture of the client's financial condition or a customer may end up with an undesired portfolio.⁹²

Inaccurate or inappropriate assumptions: Staff of SEC's Office of Investor Education and Advocacy (OIEA) and FINRA issued an investor alert on May 8, 2015, which cautioned that assumptions that underlie the algorithms used by digital wealth management firms could be incorrect.⁹³ For example, the alert states that the platform may be programmed to use economic assumptions that will not react to shifts in the market. Specifically, if the platform assumes that interest rates will remain low but

⁹¹Financial Regulatory Authority, *Report on Digital Investment Advice*, March 2016; BlackRock, *Digital Investment Advice: Robo Advisors Come of Age*, September 2016.

⁹²Securities and Exchange Commission Office of Investor Education and Advocacy and Financial Industry Regulatory Authority, *Investor Alert: Automated Investment Tools*, May 8, 2015, accessed January 3, 2017, <https://www.sec.gov/oiea/investor-alerts-bulletins/autolistngtoolshtm.html>; Financial Regulatory Authority, *Report on Digital Investment Advice*, March 2016.

⁹³Securities and Exchange Commission Office of Investor Education and Advocacy and Financial Industry Regulatory Authority, *Investor Alert: Automated Investment Tools*, May 8, 2015.

interest rates rise instead, the platform's output will be flawed, which could adversely affect investors.⁹⁴

Consumer Data Protection: To use digital wealth management platforms customers must enter personal information. According to an investor alert issued by SEC and FINRA staff, digital wealth management platforms may be collecting and sharing personal information for purposes unrelated to the platform. The alert cautions customers to safeguard personal information.⁹⁵

Industry Trends

According to publications we reviewed, fintech firms, including at least one digital wealth management platform, are using or have considered using innovative technologies such as machine learning and artificial intelligence.⁹⁶ For example, one platform is intended to track consumers' financial account activity and apply user behavior to the advice it delivers.

Hybrid services have evolved that combine traditional wealth management and digital wealth management. For example, in 2015 Vanguard implemented a service that offers investors an option of consulting with a human advisory representative in addition to its automated investment platform.⁹⁷ Traditional wealth management firms also offer digital wealth management services. For example, in 2015, Charles Schwab developed Intelligent Portfolios, available to customers

⁹⁴Securities and Exchange Commission Office of Investor Education and Advocacy and Financial Industry Regulatory Authority, *Investor Alert: Automated Investment Tools*, May 8, 2015.

⁹⁵Securities and Exchange Commission Office of Investor Education and Advocacy and Financial Industry Regulatory Authority, *Investor Alert: Automated Investment Tools*, May 8, 2015.

⁹⁶Advanced machine learning is an artificial intelligence (AI) discipline that allows computers to handle new situations via analysis, self-training, observation, and experience – with minimal “supervision” by humans. See GAO, *Data and Analytics Innovation: Emerging Opportunities and Challenges, Highlights of a Forum*, GAO-16-659SP (Washington, D.C.: September 2016); Qplum, *What is Robo-Advising* (Jersey City, NJ: May 5, 2016).

⁹⁷Vanguard Press Room, Vanguard Introduces Personal Advisor Services, Lowers Minimum to Investors With \$50,000, https://pressroom.vanguard.com/news/Vanguard_Introduces_Personal_Advisor_Services_Lowers_Minimum.html.

with \$5,000 in savings, and Deutsche Bank launched a robo-advisor within its online investment platform.⁹⁸

Regulation and Oversight

SEC regulates investment advisers, which generally includes firms that provide digital wealth management platforms. Other federal and state agencies have a role with respect to oversight of digital wealth management firms, depending upon the services a digital wealth management platform provides.

SEC and state securities regulators share responsibility for the oversight of investment advisers in accordance with the Investment Advisers Act of 1940 (Advisers Act).⁹⁹ SEC subjects digital wealth management firms to the same regulations as traditional investment advisers and requires digital wealth management firms that manage over \$110 million in assets to register as investment advisers.¹⁰⁰ The Advisers Act generally requires anyone in the business of receiving compensation for providing investment advice to others regarding securities to register with SEC or one or more states. SEC's supervision of investment advisers includes evaluating their compliance with federal securities laws by conducting examinations, including reviewing disclosures made to customers. It also investigates and imposes sanctions for violations of securities laws. SEC held a forum in November 2016 that discussed fintech innovation in the financial services industry, including the impact of recent innovation in investment advisory services, which includes digital wealth management. In January 2017, SEC's Office of Compliance Inspections and Examinations announced that electronic investment advice is a 2017 examination priority.¹⁰¹ In February 2017, SEC's Division of Investment

⁹⁸Charles Schwab press release, Charles Schwab Launches Schwab Intelligent Portfolios, <https://pressroom.aboutschwab.com/press-release/corporate-and-financial-news/charles-schwab-launches-schwab-intelligent-portfolios>; Deutsche Bank press release, https://www.db.com/newsroom_news/2015/medien/deutsche-bank-launches-maxblue-robo-advisor-en-11366.htm.

⁹⁹The Advisers Act defines an investment adviser as any person (i.e., individual or firm) who is in the business of providing advice, or issuing reports or analyses, regarding securities, for compensation. 15 U.S.C. § 80b-2(a)(11); IA Rel. No. 1092.

¹⁰⁰As noted, SEC Rule 203A-2(e) permits internet investment advisers to register with SEC if the adviser provides investment advice to all of its clients exclusively through the adviser's interactive website, except that the investment adviser may provide investment advice to fewer than 15 clients through other means during the preceding 12 months.

¹⁰¹Securities and Exchange Commission Office of Compliance Inspections and Examinations, *Examination Priorities for 2017*.

Management issued guidance for robo-advisers that provide services directly to clients over the Internet. SEC's Office of Investor Education and Advocacy issued an Investor Bulletin that provided information to help investors using robo-advisers to make informed decisions in meeting their investment goals.¹⁰²

State securities regulators generally have registration and oversight responsibilities for investment adviser firms that manage less than \$100 million in client assets, if they are not registered with SEC. According to staff from SEC, state securities regulators can bring enforcement actions against firms with assets of any amount for violations of state fraud laws. For example, the state of Massachusetts' Securities Division issued a policy in April 2016 stating that fully automated robo-advisers may be inherently unable to carry out the fiduciary obligations of a Massachusetts state-registered investment adviser.¹⁰³ The policy states that until regulators have determined the proper regulatory framework for automated investment advice, robo-advisers seeking state registration will be evaluated on a case-by-case basis.¹⁰⁴

FINRA, a self-regulatory organization, is also responsible for regulating broker-dealers doing business with the public in the United States.¹⁰⁵

¹⁰²Securities and Exchange Commission Division of Investment Management, "Guidance Update, Robo-Advisers," No. 2017-02 (Washington, D.C.: February 2017), <https://www.sec.gov/investment/im-guidance-2017-02.pdf>; Securities and Exchange Commission Office of Investor Education and Advocacy, *Investor Bulletin: Robo-Advisers*, February 23, 2017, https://www.sec.gov/oiea/investor-alerts-bulletins/ib_robo-advisers.html.

¹⁰³Massachusetts Securities Division Policy Statement – *Robo-Advisers and State Investment Adviser Registration*, April 1, 2016.

¹⁰⁴Massachusetts Securities Division Policy Statement – *Robo-Advisers and State Investment Adviser Registration*, April 1, 2016.

¹⁰⁵Most broker-dealers must register with SEC and join a self-regulatory organization, such as FINRA. By statute, a broker, in general, is any person engaged in the business of effecting transactions in securities for the accounts of others. 15 U.S.C. § 78c(a)(4). Additionally, by statute, a dealer is, in general, any person engaged in the business of buying or selling securities for that person's own account through a broker or otherwise. 15 U.S.C. § 78c(a)(5). A broker-dealer is a person or company that is in the business of buying and selling securities—stocks, bonds, mutual funds, and certain other investment products—on behalf of its customers (as broker), for its own account (as dealer), or both. Individuals who work for broker-dealers—the sales personnel whom most people call brokers—are technically known as registered representatives. For additional information on FINRA and its oversight, see GAO, *Securities Regulation: SEC Can Enhance Its Oversight of FINRA*, GAO-15-376 (Washington, D.C.: Apr. 30, 2015).

Broker-dealers can use digital investment advice tools to provide investment services to clients.¹⁰⁶ According to FINRA staff, FINRA may test the use of digital wealth management technologies by broker-dealers as part of its examinations. According to FINRA staff, FINRA has taken one enforcement action against a broker-dealer offering clients robo-adviser-like functionality.¹⁰⁷ In March 2016, FINRA issued a report to share effective practices related to digital investment advice tools and remind FINRA-registered broker-dealers of their obligations under FINRA rules, including that broker-dealers are required to supervise the types of businesses in which they engage.¹⁰⁸

CFTC has oversight authority with respect to commodity trading advisers under the Commodity Exchange Act.¹⁰⁹ According to CFTC officials, digital wealth management firms that meet the statutory definition of a commodity trading adviser would be subject to the same oversight and compliance obligations as other traditional commodity trading advisers.¹¹⁰ The act generally requires that commodity trading advisers register with CFTC.¹¹¹

Digital wealth management firms are subject to consumer protection laws that are enforced by FTC. FTC is charged with protecting consumers against unfair or deceptive acts or practices in commerce. According to

¹⁰⁶The Financial Industry Regulatory Authority generally categorizes digital investment tools into two groups: (1) those that are available to clients, referred to as “client facing” tools, and (2) those that are used by broker-dealers’ registered representatives, referred to as “inward-facing” or “advisor-facing” tools. For more information, see: Financial Industry Regulatory Authority, *Report on Digital Investment Advice*, March 2016.

¹⁰⁷Financial Industry Regulatory Authority Letter of Acceptance, Waiver, and Consent No. 2013039465901 regarding Capital One Investing, LLC.

¹⁰⁸Financial Industry Regulatory Authority, *Report on Digital Investment Advice*, March 2016.

¹⁰⁹7 U.S.C. § 1 *et seq.*

¹¹⁰The Commodity Exchange Act defines a commodity trading advisor as “any person who for compensation or profit, engages in the business of advising others, either directly or through publications, writings, or electronic media, as to the value of or the advisability of trading in” swaps, commodity futures, commodity options, or FOREX. 7 U.S.C. §1a(12).

¹¹¹7 U.S.C. § 6m(1). Pursuant to CFTC regulations, registered commodity trading advisors are required to provide certain disclosures to participants, and maintain specified books and records relating to the clients and subscribers of the commodity trading advisor as well as the advisor itself. CFTC also investigates and disciplines firms for violations of CEA and its regulations.

FTC staff, FTC enforces applicable consumer protection laws in regard to fintech services, such as digital wealth management, just as it applies those laws to other products and services. According to staff from CFPB, certain aspects of digital wealth management such as data aggregation, credit, or linked deposit accounts may also be subject to consumer oversight authority by CFPB.¹¹²

In April 2016, the Department of Labor (DOL) adopted a regulation that would expand the circumstances in which those who provide retirement investment advice, including digital wealth management firms, would have to abide by a “fiduciary” standard, acting prudently and in the best interest of their clients.¹¹³ The rule was scheduled to be applicable in April 2017.¹¹⁴ However, the President issued a memorandum on February 3, 2017, that directed the Secretary of DOL to examine the fiduciary duty rule to determine whether it may adversely affect the ability of Americans to gain access to retirement information and financial advice.¹¹⁵ In April 2017, DOL extended the applicability date for an extra 60 days.¹¹⁶

Distributed Ledger Technology

Distributed ledger technology (DLT) was introduced in 2009 as a technology intended to facilitate the recording and transferring of bitcoin, a virtual currency, specifically using blockchain.¹¹⁷ DLT has the potential

¹¹²Under the Dodd-Frank Wall Street Reform and Consumer Protection Act, CFPB was granted rulemaking authority to require certain entities to make available to consumers certain types of their digital financial account information. Pub. L. No. 111-203, § 1033, 124 Stat. 1376, 2008 (2010) (codified at 12 U.S.C. § 5533).

¹¹³See <https://www.dol.gov/ProtectYourSavings/FactSheet.htm>, accessed January 13, 2017.

¹¹⁴Definition of the Term “Fiduciary;” Conflict of Interest Rule – Retirement Investment Advice, 81 Fed. Reg. 20946 (Apr. 8, 2016).

¹¹⁵82 Fed. Reg. 9675 (Feb. 7, 2017).

¹¹⁶Definition of the Term “Fiduciary;” Conflict of Interest Rule. 82 Fed. Reg. 16902 (April 7, 2017).

¹¹⁷See GAO, *Virtual Currencies: Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges*, GAO-14-496 (Washington, D.C.: May 29, 2014).

to be a secured way of conducting transfers of digital assets in a near real-time basis potentially without the need for an intermediary.¹¹⁸

What It Is and How It Works

DLT is a generic technology for a distributed database, while blockchain is one type of DLT.¹¹⁹ According to one study we reviewed, DLT involves a distributed database maintained over a network of computers connected on a peer-to-peer basis, such that network participants can share and retain identical, cryptographically secured records in a decentralized manner.¹²⁰ A network can consist of individuals, businesses, or financial entities.

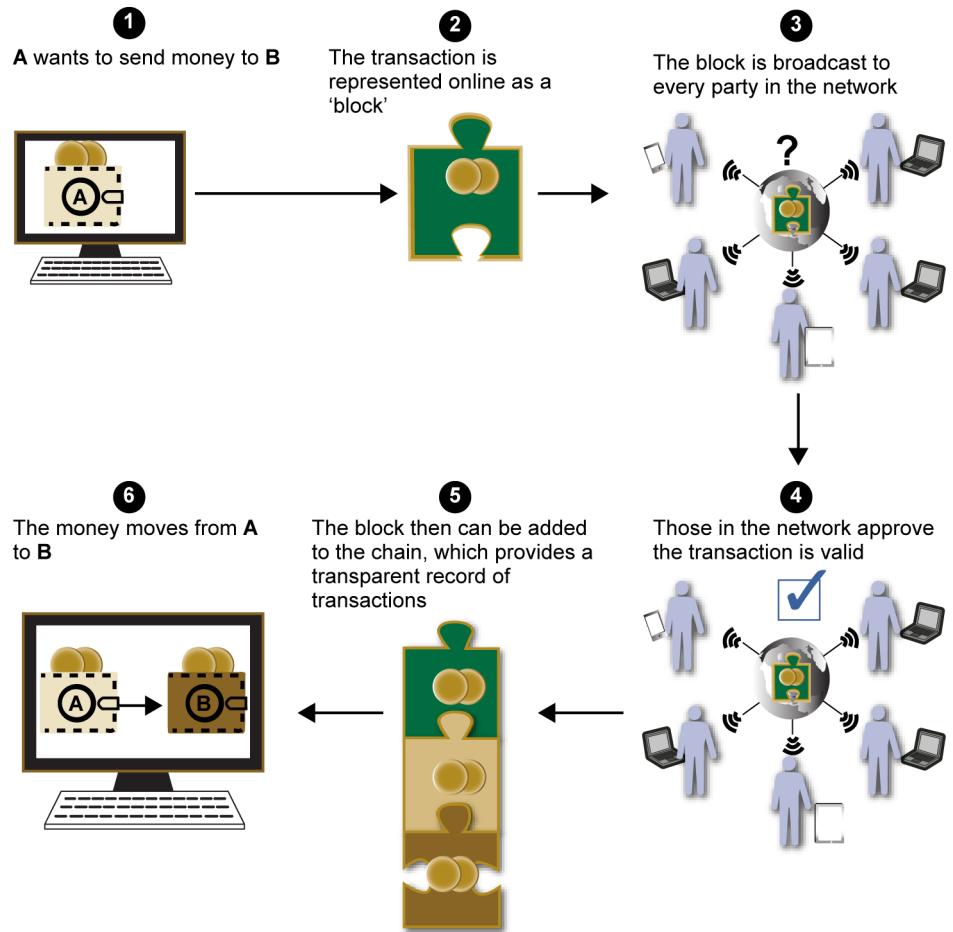
One type of DLT is blockchain, which is a shared ledger that records transactions in a peer-to-peer network. Blockchain is a series of digital blocks of information (transactions) that are chained together. The party initiating a transaction sends a message represented as a block to a network of participants that can include financial institutions, financial market participants, and regulators. For a transaction to be included, network participants must validate the transaction. Once a transaction has been confirmed, details of the transaction are recorded on the blockchain that can be visible to network participants (see fig. 6).

¹¹⁸An intermediary can include financial institutions (such as banks, broker/dealers, and other institutions that interact with the end-users of a financial transaction) and infrastructures (such as payment, clearing, and settlement systems for funds, securities, and derivatives). See David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>; Board of Governors of the Federal Reserve System, *Consumer Compliance Outlook, Fintech Special Edition*, 3rd ed. (Philadelphia, Pa.: 2016).

¹¹⁹For purposes of this report, we refer to blockchain as a type of distributed ledger technology.

¹²⁰Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January 2017.

Figure 6: How Blockchain Works



Source: GAO. | GAO-17-361

DLT solutions can have different types of access control. For example, there may be “permissionless” (public) ledgers that are open to everyone to contribute data to the ledger and cannot be owned; or “permissioned” (private) ledgers that may have one or many owners and only they can add records and verify the contents of the ledger. According to one study, permissioned DLT is not fully decentralized.¹²¹

¹²¹International Organization of Securities Commissions, *IOSCO Research Report on Financial Technologies (Fintech)*, February 2017.

According to publications we reviewed, an important feature of blockchain is that transactions added to a ledger are validated by network participants.¹²² This validation process is referred to as a consensus mechanism.¹²³ Consensus mechanisms can help prevent the problem of double spending.¹²⁴ Publications we reviewed indicate there are different kinds of consensus mechanisms that include proof-of-work and proof-of-stake.¹²⁵ Proof-of-work may be used in permissionless DLT and proof-of-stake may be used in permissioned DLT. Consensus mechanisms also incorporate security aspects such as cryptography and digital signatures that are listed below:

- Cryptography is used to encrypt data to ensure transactions are valid and provide identity verification. For example, during asset transfers, a form of cryptography known as public key cryptography usually forms the foundation of the transaction validation process.¹²⁶

¹²²United States Postal Service, Office of Inspector General, *Blockchain Technology: Possibilities for the U.S. Postal Service*, Report No. RARC-WP-16-011, May 23, 2016, accessed January 11, 2017, <https://www.uspsoig.gov/sites/default/files/document-library-files/2016/RARC-WP-16-001.pdf>; United Kingdom Government Office for Science, *Distributed Ledger Technology: beyond block chain*, December 2015, accessed January 11, 2017, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf.

¹²³A consensus mechanism is the way in which a majority or all network members agree on the value of a proposed transaction, which is then updated to the ledger. There are different mechanisms that can build consensus using algorithms.

¹²⁴For example, bitcoins are created and entered into circulation through a process called mining. Bitcoin miners download free software that they use to solve complex math problems. Solving these problems verifies the validity of bitcoin transactions by grouping several transactions into a block and mathematically proving that the transactions occurred and did not involve double spending of a bitcoin.

¹²⁵Byzantine Fault Tolerance is another example of a consensus mechanism. For more information on consensus mechanisms, see International Organization of Securities Commissions, *IOSCO Research Report on Financial Technologies (Fintech)*, February 2017; United Kingdom Government Office for Science, *Distributed Ledger Technology: beyond block chain*, December 2015.

¹²⁶David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), “Distributed ledger technology in payments, clearing, and settlement,” Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>.

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- Digital signatures are based on cryptography and are used in DLT to certify the authenticity of transactions (i.e., to show that a person is the true owner of an indicated digital identity). When a person creates and sends a DLT transaction, the transaction must also bear that person's digital signature.¹²⁷

Who Uses It

According to publications we reviewed, agencies, financial institutions, and industry stakeholders have identified potential uses for DLT in the financial service industry through the clearing and settlement of financial transactions.¹²⁸ Examples of these transactions include:

- international money transfers;¹²⁹
- private trades in the equity market; and
- insurance claims processing and management.

DLT can also incorporate smart contracts. Smart contracts can automate different kinds of processes and operations. For example, smart contracts can facilitate the automation of complex, multiparty transactions, such as the payment of bonds and insurance coupons.¹³⁰ According to one study,

¹²⁷United Kingdom Government Office for Science, *Distributed Ledger Technology: beyond block chain*, December 2015.

¹²⁸David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>; Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January 2017; Financial Stability Oversight Council 2016 Annual Report (Washington, D.C.: June 21, 2016); Alan McQuinn, Weining Guo, and Daniel Castro, *Policy Principles for Fintech*, Information Technology & Innovation Foundation, October 2016; United Kingdom Government Office for Science, *Distributed Ledger Technology: beyond block chain*, December 2015; United States Postal Service, Office of Inspector General, *Blockchain Technology: Possibilities for the U.S. Postal Service*, Report No. RARC-WP-16-011, May 23, 2016; World Economic Forum, *The Future of Financial Infrastructure: An ambitious look at how blockchain can reshape financial services*, August 2016, accessed January 11, 2017, <https://www.weforum.org/reports/the-future-of-financial-infrastructure-an-ambitious-look-at-how-blockchain-can-reshape-financial-services>.

¹²⁹See GAO-14-496. As we previously reported, virtual currencies can be used to make payments and transfer funds.

¹³⁰Financial Stability Oversight Council, 2016 Annual Report (Washington, D.C.: June 21, 2016).

there are several versions of smart contracts composed using computer code.¹³¹

Potential Benefits

Transparency: According to publications we reviewed, DLT has the potential to facilitate transparency between financial institutions, regulators, and other financial market participants.¹³² DLT can increase transparency between participants by creating a shared record of activity where participants have access in real time. Changes by any participant with the necessary permission to modify the ledger are immediately reflected in all copies of the ledger. Because distributed ledgers can be designed to be broadly accessible and verifiable, the technology could enhance financial market transparency.

Efficiencies: According to publications we reviewed, DLT can enhance efficiencies in securities and payment clearing and settlement times.¹³³ Specifically, DLT has the potential to reduce settlement times for securities transactions by facilitating the exchange of digital assets during the same period of time as the execution of a trade. According to staff from SEC, while the financial services industry is moving toward shortening settlement cycles, DLT may offer efficiencies should it be deployed in securities clearance and settlement functions. In 2015, SEC requested comments on how blockchain technology could facilitate the role of a transfer agent and separately, in 2016, requested comments on the utility of DLT in shortening the settlement cycle for most broker-dealer

¹³¹Chamber of Digital Commerce, Smart Contracts Alliance, *Smart Contracts: 12 Use Cases for Business & Beyond* (Washington, D.C.: December 2016).

¹³²David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>; Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January 2017; United Kingdom Government Office for Science, *Distributed Ledger Technology: beyond block chain*, December 2015; World Economic Forum, *The Future of Financial Infrastructure: An ambitious look at how blockchain can reshape financial services*, August 2016.

¹³³Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January 2017; S&P Global Market Intelligence, *An introduction to fintech: Key Sectors and trends*, October 2016.

securities transactions.¹³⁴ In addition, conducting international money transfers through DLT can provide real-time settlement.

Potential Risks

Like most new technologies, DLT can pose certain risks and uncertainties, which market participants and financial regulators and agencies will need to monitor.

Operational risk including security risk: According to a publication by the Board of Governors of the Federal Reserve System, operational failures include errors or delays in processing, system outages, insufficient capacity, fraud, and data loss and leakage.¹³⁵ According to a FINRA report, given that DLT involves sharing of information over a network it poses security-related risks.¹³⁶ The Financial Stability Oversight Council noted that market participants have limited experience working with distributed ledger systems, and it is possible that operational vulnerabilities associated with such systems may not become apparent until they are deployed at scale.¹³⁷ According to officials from CSBS, permissionless DLT presents security risks (e.g., anti-money-laundering and Bank Secrecy Act) that can be mitigated.

Industry Trends

Publications we reviewed suggest some financial institutions have taken several approaches to adopt DLT. For example, some financial institutions have initiated blockchain projects, joined a multiparty consortium, or announced partnerships to examine DLT's potential. In

¹³⁴Transfer agents record changes of ownership, maintain an issuer's security holder records, cancel and issue certificates, and distribute dividends. See Transfer Agent Regulations, 80 Fed. Reg. 81948 (December 31, 2015) and Amendment to Securities Transaction Settlement Cycle, 81 Fed. Reg. 69240 (October 5, 2016).

¹³⁵David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>.

¹³⁶Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January 2017.

¹³⁷Financial Stability Oversight Council, *2016 Annual Report* (Washington, D.C.: June 21, 2016).

addition, the largest securities depository and a large stock exchange have used DLT.

- According to the World Economic Forum, 80 percent of banks are expected to initiate blockchain projects by 2017.¹³⁸
- The R3 industry consortium made up of over 50 financial institutions designed a DLT platform for recording and managing financial agreements named Corda.¹³⁹
- The Depository Trust and Clearing Corporation proposed to build a derivatives distributed ledger solution for post-trade processing.¹⁴⁰ Through this initiative, the Depository Trust and Clearing Corporation seeks to reduce costs and increase efficiencies in the post-trade process.
- In December 2015, the stock exchange Nasdaq enabled its first trade on a blockchain using its Linq ledger through a private blockchain developer.¹⁴¹ Nasdaq Linq is a digital ledger technology that leverages a blockchain to issue and record transfers of shares of privately-held companies.

Regulation and Oversight

Continued development of DLT is needed to understand how DLT and its components will be regulated by the existing legal and regulatory system.¹⁴² Additionally, it is unclear whether new regulation will need to be created because DLT can present new and unique challenges. According to the Financial Stability Oversight Council, financial regulators should monitor how a DLT network can affect regulated entities and their

¹³⁸World Economic Forum, *The Future of Financial Infrastructure: An ambitious look at how blockchain can reshape financial services*, August 2016.

¹³⁹R3, "Introducing R3 Corda: A Distributed Ledger Designed for Financial Services," April 5, 2016, accessed March 6, 2017, <http://www.r3cev.com/blog/2016/4/4/introducing-r3-corda-a-distributed-ledger-designed-for-financial-services>.

¹⁴⁰See <http://www.dtcc.com/news/2017/january/09/dtcc-selects-ibm-axoni-and-r3-to-develop-dtccs-distributed-ledger-solution>, for more information.

¹⁴¹Accessed March 7, 2017, <http://ir.nasdaq.com/releasedetail.cfm?releaseid=948326>.

¹⁴²David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird (2016), "Distributed ledger technology in payments, clearing, and settlement," Finance and Economics Discussion Series 2016-095, Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.095>; Financial Stability Oversight Council, 2016 Annual Report (Washington, D.C.: June 21, 2016).

operations.¹⁴³ Representatives of financial regulators have noted the importance of implementing DLT in a manner that is transparent and satisfies regulatory requirements.¹⁴⁴

With respect to virtual currencies, federal and state regulators have taken varied approaches to regulation and oversight.¹⁴⁵ For example, in 2015, CFTC stated it considers bitcoin and other virtual currencies to be included in the definition of “commodity” under the Commodity Exchange Act.¹⁴⁶ SEC’s Office of Investor Education and Advocacy has stated that the rise of bitcoin and other virtual and digital currencies creates new concerns for investors.¹⁴⁷ Two bureaus within the Department of the Treasury treat bitcoin in different ways, including the Department of the Treasury Financial Crimes and Enforcement Network (FinCEN), which determined that certain virtual currency businesses would be money transmitters under the Bank Secrecy Act, subject to regulation as money services businesses, and the Internal Revenue Service, which treats bitcoin as property for U.S. federal tax purposes.¹⁴⁸ FTC can apply the Federal Trade Commission Act to combat unfair or deceptive acts or practices in or affecting commerce, which includes virtual currencies. In addition, approximately 44 states have issued licenses to companies that use virtual currency in their business model.¹⁴⁹ The existing regulatory

¹⁴³The Financial Stability Oversight Council was created by the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 as a body designed to identify risks and respond to emerging threats to the United States’ financial stability. Pub. L. No. 111-203, § 112, 124 Stat. 1376, 1394-1398 (2010).

¹⁴⁴Governor Lael Brainard, *Distributed Ledger Technology: Implications for Payments, Clearing, and Settlement*, Speech at the Institute of International Finance Annual Meeting Panel on Blockchain, Washington, D.C., October 7, 2016; Securities and Exchange Commission, Fintech Forum: The Evolving Financial Marketplace, November 14, 2016, accessed February 21, 2017, <https://www.sec.gov/spotlight/fintech/transcript-111416.pdf>.

¹⁴⁵This report does not cover all applicable regulatory requirements and oversight activities related to virtual currencies. For more information see [GAO-14-496](#).

¹⁴⁶CFTC’s jurisdiction is generally limited to the Commodity Exchange Act and entities registered with CFTC, such as intermediaries or derivatives clearing organizations.

¹⁴⁷See https://www.sec.gov/oiea/investor-alerts-bulletins/investoralertsia_bitcoin.html.

¹⁴⁸FinCEN coordinates with its state counterparts to encourage application of FinCEN’s guidance on virtual currencies as part of this process. FinCEN is the administrator of the Bank Secrecy Act.

¹⁴⁹The Conference of State Bank Supervisors and Money Transmitter Regulators Association, *The State of State Money Services Businesses and Regulation and Supervision*, May 2016.

complexity for virtual currencies indicates that regulatory approaches for future applications for DLT will also be complex.

According to interviews we conducted, some agencies and one industry association formed working groups to monitor and understand DLT and virtual currencies. These examples are listed below.

- In 2015, CFTC formed a working group on blockchain, distributed ledger technology, and virtual currencies to study their application to the derivatives market and promote understanding and communication across the agency. In 2017, the group broadened its focus to cover other aspects of fintech and changed its name to the FinTech Working Group.
- In 2016, the Federal Reserve established a working group that is looking at financial innovation across a broad range of responsibilities, including in payments and market infrastructures, supervision, and financial stability.
- In November 2013, SEC formed an internal Digital Currency Working Group to build expertise; identify emerging risk areas for potential regulatory, examination, and enforcement action; and coordinate efforts within SEC in the digital and virtual currency space. In November 2016, the group changed its name to reflect that its efforts had expanded beyond digital and virtual currencies into related distributed ledger technologies and their applications. According to SEC staff, the Distributed Ledger Technology Working Group plans to evaluate when and how distributed ledger technology will be used within the securities market.
- In 2016, FDIC established the FinTech wholesale working group of intra-agency experts to monitor work in the areas of DLT, blockchain, and smart contracts.
- In 2015, the Chamber of Digital Commerce formed an alliance to provide technical assistance and periodic informational sessions on Bitcoin, other digital currencies, and broader uses of blockchain.¹⁵⁰

Agency Comments and Our Evaluation

We provided a draft of this report for review and comment to CFPB, CFTC, CSBS, FDIC, the Federal Reserve, FINRA, FTC, NCUA, OCC, SBA, SEC, and Treasury. We incorporated technical comments we received from these agencies, as appropriate. In addition, we received

¹⁵⁰<http://www.digitalchamber.org/blockchain-alliance.html>.

written comments from NCUA and CSBS, which are summarized below and reprinted in appendixes II and III.

In its written comments, NCUA acknowledged that regulators face challenges understanding the risk of the rapidly evolving financial technology industry and the challenge of balancing regulations and guidance to address those risks against stifling innovation. NCUA noted that it continues to evaluate risks and monitor the evolving market impact driven by fintech companies and to indirectly supervise activities through credit unions to the extent possible.

In its written comments, CSBS noted that it had formed a task force to study fintech developments and determine the potential impact on consumer protection, state law, and banks and nonbank entities chartered or licensed by the states. CSBS also provided additional information about the state regulatory system for marketplace lending, mobile payments, and distributed ledger consumer products while noting that the states actively license and supervise companies engaged in these services. CSBS also noted that the states have work under way to improve the Nationwide Multistate Licensing System with a technological overhaul to improve compliance with state licensing requirements.

We are sending copies of this report to the congressional requesters, agencies, and other interested parties. In addition, this report will be available at no charge on our website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-8678 or evansl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

A handwritten signature in black ink, appearing to read "Lawrence L. Evans, Jr." The signature is fluid and cursive, with "Lawrence" on the left, "L." in the middle, and "Evans, Jr." on the right.

Lawrence L. Evans, Jr.
Director, Financial Markets and Community Investment

Appendix I: Agencies with Oversight Responsibilities Related to Financial Technology Firms

Regulation of financial technology (fintech) firms depends on the extent to which the firms provide a regulated service and the format in which the services are provided. Table 3 explains the basic functions of federal and state regulators and agencies with oversight responsibilities related to the following subsectors: marketplace lending, mobile payments, digital wealth management, and distributed ledger technology.

Table 3: Federal and State Regulators and Agencies with Oversight Responsibilities Related to Financial Services Offered by Financial Technology Firms

Regulator or agency	Basic function
Board of Governors of the Federal Reserve System	Supervises state-chartered banks that opt to be members of the Federal Reserve System, bank and thrift holding companies, and the nondepository institution subsidiaries of those institutions, and nonbank financial companies designated by the Financial Stability Oversight Council (FSOC) for consolidated supervision and enhanced prudential standards and certain financial market utilities designated as systemically important by FSOC. Supervises state-licensed branches and agencies of foreign banks and regulates the U.S. nonbanking activities of foreign banking organizations.
Federal Deposit Insurance Corporation	Supervises insured state-chartered banks that are not members of the Federal Reserve System, as well as state savings associations and any insured state chartered branches of foreign banks; insures the deposits of all banks and thrifts that are approved for federal deposit insurance; resolves all failed insured banks and thrifts; and may be appointed to resolve large bank holding companies and nonbank financial companies that are supervised by the Board of Governors of the Federal Reserve System. Also has backup supervisory responsibility for all federally insured depository institutions
National Credit Union Administration	Charters and supervises federally chartered credit unions and insures savings in federal and most state-chartered credit unions.
Office of the Comptroller of the Currency	Charters and supervises national banks, federal savings associations, and federally chartered branches and agencies of foreign banks.
Bureau of Consumer Financial Protection	Regulates the offering and provision of consumer financial products or services under the federal consumer financial laws. For depository institutions with over \$10 billion in assets and their affiliates, the Bureau of Consumer Financial Protection (CFPB) has exclusive examination authority as well as primary enforcement authority for the federal consumer financial laws. CFPB also supervises certain nondepository financial entities, including certain kinds of mortgage market participants, private student lenders, and payday loan lenders, and enforces the federal consumer financial laws. The Dodd-Frank Act prohibits unfair, deceptive, or abusive acts or practices and CFPB enforces this prohibition and the other federal consumer financial laws for persons under its jurisdiction.
Department of the Treasury Financial Crimes Enforcement Network	The Treasury Financial Crimes Enforcement Network (FinCEN) implements and enforces the Bank Secrecy Act (BSA). FinCEN has the authority under 31 U.S.C. §5318(a)(3) to examine financial institutions for compliance with BSA and regulations promulgated under BSA at 31 C.F.R. Chapter X, as well as to take enforcement actions for violations of BSA and the implementing regulations under 31 U.S.C. §§ 5320-23.
Federal Communications Commission	Primary regulator of interstate and international communications by radio, wire, satellite, and cable.

Appendix I: Agencies with Oversight Responsibilities Related to Financial Technology Firms

Regulator or agency	Basic function
Federal Trade Commission	Maintains competition and has consumer protection enforcement authority over certain nonbank financial entities, including certain kinds of mortgage market participants, payment processors, private student lenders, and payday loan lenders, for the purposes of enforcing the consumer financial protection laws. The Federal Trade Commission has investigative and law enforcement authorities to protect consumers from unfair or deceptive acts or practices in most sectors of the economy.
Securities and Exchange Commission	Primary regulator of the securities markets, including offers and sales of securities and regulation of securities activities of certain participants such as securities exchanges, broker-dealers, investment companies, clearing agencies, transfer agents, and certain investment advisers and municipal advisors. The Securities and Exchange Commission's (SEC) mission is to protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation. SEC also oversees self-regulatory organizations, such as the Financial Industry Regulatory Authority (FINRA). FINRA regulates the broker-dealer industry with the mission to pursue investor protection and market integrity.
Commodity Futures Trading Commission	Primary regulator of the derivatives markets whose mission is to protect market users and the public from fraud, manipulation, abusive practices, and systemic risk related to derivatives subject to the Commodity Exchange Act and to foster open, competitive, and financially sound futures markets.
State banking regulators	Oversee depository and nondepository institutions for safety and soundness, consumer protection, and Bank Secrecy Act requirements.
State securities regulators	Oversee the securities market and have responsibility for licensing securities firms and investment professionals, such as broker-dealers and investment advisers, registering certain securities offerings, and investigating securities fraud.

Source: GAO. | GAO-17-361.

Appendix II: Comments from the National Credit Union Administration



National Credit Union Administration

March 20, 2017

SENT BY E-MAIL

Lawrence L. Evans, Jr.
Director, Financial Markets and Community Investment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548
evansl@gao.gov

Dear Mr. Evans:

We have reviewed the GAO's draft report entitled *Financial Technology – Information on Subsectors and Regulatory Oversight (GAO-17-361)*. We acknowledge your observation that regulators face challenges understanding the risks of the rapidly evolving financial technology industry. We also acknowledge the challenge of balancing regulations and guidance to address those risks against stifling innovation.

The report acknowledges that NCUA is impeded from supervising fintech activities affiliated with credit unions because we do not possess comparable authority provided to federal banking regulators under the Bank Service Company Act. Under the Bank Service Company Act, bank regulators have authority to examine third-party service providers.

Like the other regulators, NCUA continues to evaluate risks and monitor the evolving market impact driven by fintech companies and we continue to indirectly supervise activities through credit unions partners to the extent possible.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink that reads "Mark Treichel".

Mark Treichel
Executive Director

1775 Duke Street - Alexandria, VA 22314-3428

Appendix III: Comments from the Conference of State Bank Supervisors



CONFERENCE OF STATE BANK SUPERVISORS

March 24, 2017

Lawrence L. Evans, Jr.
Director, Financial Markets and Community Investment
Government Accountability Office
441 G St., NW
Washington, DC 20548

Re: GAO-17-361 Financial Technology: Information on Subsectors and Regulatory Oversight

Dear Mr. Evans,

The Conference of State Bank Supervisors ("CSBS") is pleased to comment on GAO-17-361, *Financial Technology: Information on Subsectors and Regulatory Oversight* ("Report"). The advancement of technology in financial services has expanded the industry's ability to reach consumers, support small businesses, and improve operations. The diversity of financial technology ("fintech") products warrants research by policy makers, and this report by the Government Accountability Office ("GAO") provides a strong foundation for some of the current fintech issue areas.

To further address the purpose and subject matter of this report, CSBS submits this letter to:

1. Review the state system of regulatory oversight; and
2. Provide analytical insight that is only available from state regulators.

CSBS has also submitted some technical edits to GAO, and consents to GAO using language from this letter to update the Report if GAO deems it prudent.

CSBS welcomes any further discussion on fintech from GAO or Congress. The states recognize that fintech developments warrant an environment where technological innovation can be developed and regulated in a clear manner. To facilitate this process, CSBS formed the Emerging Payments and Innovation Task Force to study fintech developments and determine the potential impact on consumer protection, state law, and banks and non-bank entities chartered or licensed by the states. The Task Force continues to take a comprehensive approach to fintech, engaging with a broad range of stakeholders to understand how new entrants and technologies affect the

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stability of the financial marketplace and to develop ideas for connecting fintech to the financial regulatory fabric.

State Regulators Actively Oversee Fintech Companies

Defining and describing fintech is a difficult task, which GAO tackles in an effective manner by outlining common business models and the respective regulatory models. CSBS would like to take the opportunity to expand on the regulatory models reviewed, including a general overview of the applicability of state financial services laws and fintech-specific applications.

The State Regulatory System

CSBS and its members have first-hand knowledge of companies this report identified as “fintech” companies, particularly in marketplace lending, mobile payments, and distributed ledger technology consumer services. Most State legislatures have placed responsibility for regulating non-bank financial services industries with the state banking department. Accordingly, CSBS members are responsible for non-bank consumer lenders, money services businesses (“MSBs”), and mortgage lenders, including those with business models that are fintech in nature. When fintech companies perform these activities, the states are responsible for licensure and supervision consistent with state and federal law.

Accordingly, the states actively license and supervise companies engaged in marketplace lending, mobile wallets, and some distributed ledger business models.

Marketplace Lenders – Consumer Finance

State consumer finance licensing laws require prospective licensees to file an application that typically includes the submission of credit reports, fingerprints, a business plan, financial statements, and a surety bond. The prospective licensee may be required to provide evidence of policies, procedures, and internal controls that will facilitate the organization’s compliance with state and federal laws, including disclosure, servicing, and debt collection requirements. Once a license is granted, management is required to maintain compliance with federal and state law. State regulators then have the ability to supervise these lenders, ensuring that the company is complying with state and federal lending laws.

3

The act of making an unsecured loan to a consumer¹ – on the internet or in person – requires state licensure as a consumer credit provider.² Though state product requirements may vary,³ marketplace lending consumer loans like those described in the Report generally fall into consumer credit licensing.

Using examples from the Report, CSBS can confirm that all identified consumer marketplace lenders hold state licenses.⁴ Though many of these marketplace lenders originate through a depository institution, state licensure is still appropriate in most situations. However, some licensed marketplace lenders have taken the position that loans purchased from a bank are outside the scope of state consumer credit licensing authority. This argument makes marketplace lenders susceptible to the “true lender test.” If a marketplace lender is deemed to be the “true lender” in a transaction, they will be required to be state-licensed and products must comply with state law.⁵

Once licensed, the states supervise marketplace lenders through on-site examinations. These exams review both state and federal consumer protection laws in addition to state financial safety and soundness requirements. While federal regulators may have authority to conduct examinations under the Bank Service Company Act, the states are required to examine licensed consumer credit companies – including marketplace lenders – regularly.

Mobile Wallets and Distributed Ledger Consumer Products – Money Services Businesses

Mobile wallet providers offering direct to consumer services are likely money transmitters under state law.⁶ Generally, taking, holding, and/or sending money is a licensed activity under state

¹ As in federal law, commercial lending is exempt from most state law protections. However, there are states that regulate commercial loans. See, e.g. North Dakota Money Broker License, available at <http://mortgage.nationwidelicensingsystem.org/sl/PublishedStateDocuments/ND-MB-License-Description.pdf>.

² See, e.g. Oregon Consumer Finance License, available at <http://mortgage.nationwidelicensingsystem.org/sl/PublishedStateDocuments/OR-Cosumer-Finance-License-Company-Description.pdf>; New Hampshire Small Loan Lender Company License, available at <http://mortgage.nationwidelicensingsystem.org/sl/PublishedStateDocuments/NH-Small-Loan-Lender-Company-Description.pdf>.

³ Typically, state thresholds vary for interest rate, principal, and term.

⁴ Licensing records for Avant, SoFi, LendingClub, Prosper, and UpStart can all be found on NMLS Consumer Access at nmlsconsumeraccess.org.

⁵ See *Meade v. Avant*, Case No. 17CV30377 (D. Colorado Mar. 9, 2017). CSBS further explained this issue in a 2015 letter to Treasury on marketplace lending, available at <https://www.csbs.org/regulatory/policy/Documents/2015/CSBS-NACCA%20Marketplace%20Lending%20RFI.pdf>.

⁶ The core underpinning of NMLS is agreed upon business activity definitions. Despite different statutory language, thirty-six states apply the following business activity definition for electronic money transmitting, likely covering all mobile wallet providers: “Accepting or instructing to be delivered currency, funds, or other value, such as stored value, that substitutes for currency to another location or person by electronic means, such as mobile-to-mobile payments.” Available at

MSB laws. Despite the use of different language in MSB laws, a common set of requirements exists for companies seeking to operate nationally. To operate in 49 states,⁷ D.C., and Puerto Rico, a money transmitter must be bonded, maintain permissible investments, and satisfy minimum net worth requirements. While the dollar amount of these requirements varies, the legal requirement to meet these regulatory standards is consistent.

Importantly, the states do not just examine for state law. The Electronic Funds Transfer Act and Bank Secrecy Act are key components to the state examination process. The states have taken actions against licensed money transmitters for violations of the Bank Secrecy Act, Office of Foreign Asset Control requirements, and other federal requirements.⁸

Since the regulatory requirements are common among the states, industry oversight is in the process of standardization. As of March 2017, 45 states, D.C., and Puerto Rico have signed the Nationwide Cooperative Agreement for MSB Supervision and its companion Protocol for Performing Multi-State Examinations.⁹ This Protocol and Agreement establishes the Multi-State MSB Examination Taskforce, a group of 10 states tasked with enhancing the state system for money services businesses supervision and fostering regulatory consistency. Through the MMET, the states coordinate oversight of the approximately 250 MSBs that operate in multiple states, including companies listed in the Report. In 2016, the MMET coordinated 56 examinations of multi-state MSBs where teams of examiners from different states conducted coordinated supervision.¹⁰ Notwithstanding varying licensing requirements and oversight mechanisms, the states examine together in a manner that increases efficiency for both the states and industry.

Several fintech business models have emerged in which a digital wallet is provided to customers using distributed ledger virtual currencies. The states and CSBS have addressed this issue through the CSBS Emerging Payments and Innovation Task Force. After engagement with industry participants, state and federal regulators, and other stakeholders, CSBS concluded that activities involving third party control of virtual currency should be subject to state licensure and

⁷ Montana does not require licensure of money services businesses.

⁸ See, e.g. *In the Matter of PayPal, Inc.*, Massachusetts Consent Order, Docket No. 2014-005 (28 May 2014). Available at <http://nmlsconsumeraccess.org/EntityDetails.aspx/Artifact/Final%20Order.pdf?g=111350-211164>.

⁹ Nationwide Cooperative Agreement for MSB Supervision (January 2012), available at <https://www.csbs.org/regulatory/Cooperative-Agreements/Documents/MSB/MSB-CooperativeAgreement010512clean.pdf>;

Protocol for Performing Multi-state Examinations (January 2012) available at <https://www.csbs.org/regulatory/Cooperative-Agreements/Documents/MSB/MSB-Protocol010512.pdf>.

¹⁰ See MMET Annual Reports, available at <https://www.csbs.org/news/presentations/annualreports/Pages/nondereports.aspx>. At the time of this letter, the 2016 MMET Annual Report is not finalized. It will be available in the second quarter of 2017.

supervision.¹¹ CSBS produced a model regulatory framework for states to utilize, and continue to work with the states and industry to tailor the regulatory process for licensed activities that occur with virtual currency.

Since the release of the CSBS Virtual Currency Model Regulatory Framework, states have licensed and examined virtual currency mobile wallet providers. In the states' experience, the traditional approach to MSB examination has worked, though unique issues have arisen that warrant further review in the supervisory process. These issues include valuation of virtual currency transactions, fluctuating value of virtual currency, verifying virtual currency ownership, confirming balances, cybersecurity, and the irreversible nature of virtual currency transactions. The MMET is cognizant of these issues and continues to monitor for best practices.

Paperless Mortgage Origination – Mortgage Lenders

Though not mentioned in the report, non-bank mortgage lenders are actively engaged in deploying fintech innovations. Several mortgage loan originators now offer an application process that can be completed without paperwork. Others are utilizing technology to streamline the process of transmitting financial records between the consumer, company, and investors. Deploying technology in an innovative manner is possible because of a strong state licensing and supervisory system.

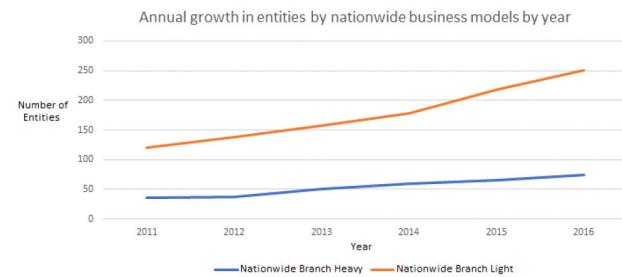
Mortgage loan originators in every state are required to be licensed through the Nationwide Multi-State Licensing System ("NMLS").¹² Further, all non-bank mortgage companies are required to submit reports of condition through NMLS, which creates a concise picture of the non-bank mortgage industry. From this data, NMLS can derive technology trends in the mortgage lending industry, including the number of companies that operate with a limited or no physical presence.

State regulators have recognized an increase in technology-dependent mortgage lenders over the past 5 years.¹³ Logically, companies with a limited physical presence and nationwide originations ("Branch Light") are dependent on technology to interact with customers. Conversely, companies with numerous, widespread branch locations ("Branch Heavy") rely on the traditional in-person, bricks and mortar business model.

¹¹ For more information, see <https://www.csbs.org/regulatory/ep/pages/framework.aspx>.

¹² The Secure and Fair Enforcement for Mortgage Licensing Act, 12 U.S.C. § 5101 et seq.

¹³ For the purposes of this analysis, technology-dependent companies are considered firms with more state licenses than branches.



The technology-dependent “Branch Light” entities are growing at a rate far outpacing the traditional “Branch Heavy” entities. However, this growth in technology-dependent companies has not affected market share.

Technology-dependent mortgage lenders originated approximately \$226 billion in 2016, up from \$176 billion in 2015. Despite this growth in nominal volume, the market share percentage has remained the same. Technology-dependent companies have consistently originated about 20% of the non-bank mortgage loans over the past 4-years.

Based on the data above, the state system clearly supports technological innovation on a large scale. All mortgage lenders, regardless of technology deployed, are licensed and supervised to ensure compliance with federal and state consumer protection laws. Business models dependent on technology can thrive in the state system because the NMLS serves as an efficient licensing resource, and state regulators actively ensure the use of technology protects consumer and economic interests.

Banks

States are also responsible for chartering and supervising state chartered banks. These banks originate loans through marketplace lenders, purchase marketplace lender loans, utilize mobile wallet products, and are actively exploring distributed ledger technology development. The dual responsibility of bank and non-bank supervision gives the states unique insight into depository and non-depository fintech issues.

Drawing from this dual responsibility, state regulators can confirm the Report’s findings that fintech companies generally must comply with bank third-party vendor oversight or state licensure and supervision.¹⁴ Only commercial lenders operating independently of banks would avoid both third-party bank oversight and state licensure.

¹⁴ CSBS explains third-party oversight in detail in a 2015 letter to Treasury on marketplace lending, *available at* <https://www.csbs.org/regulatory/policy/Documents/2015/CSBS-NACCA%20Marketplace%20Lending%20RFI.pdf>.

The NMLS Provides Insight into Fintech

The states developed the NMLS to serve as the system that facilitates compliance with state licensing laws.¹⁵ Through this common structure, the states gather information useful to policy makers, industry, and regulators alike.

Through the NMLS, the states collect a substantial amount of information. Notable data fields for fintech companies include:

- Identifying information, including trade names;
- Financial statements;
- Bank account information;
- Legal status, including corporate formation and state;
- Affiliates and subsidiaries; and
- Control and ownership.

This information is used to inform a view of regulated industries, which can be leveraged for public stakeholders. NMLS also has information specific to the types of fintech companies identified in the Report.

NMLS Data – Money Transmitters

By the end of 2016, 36 agencies managed their money transmitter licenses in NMLS.¹⁶ The NMLS Uniform Authorized Agent Reporting (“UAAR”) functionality, deployed in 2014, permits state-licensed money transmitters to upload their authorized agents for reporting to state regulators. At year-end 2016, 31 agencies were using the UAAR functionality. From these reports, NMLS data reflects:

- 346 companies hold a total of 3,806 state money transmitter licenses in NMLS;
- 58 percent of the companies are licensed in more than one state;
- 99 companies are licensed in more than 10 states;
- 178 companies report 233,145 Active Authorized Agent relationships in NMLS, and 98 report no agents use (as of 9/30/2016);
- NMLS contains 157,839 Active Agent Locations, with 43,032 used by multiple principals (as of 9/30/2016); and

¹⁵ At the end of 2016, NMLS was the licensing system of record for 62 state agencies, managing a total of 601 different license authorities covering a broad range of non-depository financial services. This is up from 585 at the end of 2015. NMLS manages 327 company, 193 branch, and 81 individual license types.

¹⁶ On April 1, 2017, Oregon will become the 37th state to manage licenses through the NMLS.

- Ten companies have uploaded over 5,000 agents (as of 9/30/2016).¹⁷

From this data, policy makers can extract several trends. First, the MSB industry trends towards multi-state activity. Second, companies without agents likely utilize the internet. Accordingly, the MSB industry has diverging business models: large multi-state companies that engage in electronic money transfer,¹⁸ large multi-state companies that engage in physical money transfer,¹⁹ and specialty MSBs that serve local communities.²⁰

The NMLS has also developed functionality for collecting MSB call report information. Starting with first quarter 2017 data, NMLS will be collecting company-specific data, including financial condition, state-specific transactions, company-wide transactions, permissible investments, and destination country reporting. This information will be a primary source for determining market trends, allocating regulatory resources, and streamlining reporting requirements for companies operating across state lines.

The MSB Call Report will be particularly useful when discussing remittances and access to financial services. Currently, there is no data source for U.S. consumer payments across borders. Once MSB Call Report data is collected and verified, the NMLS will be able to identify where U.S. consumers send money, as well as market trends over time.

NMLS Data – Marketplace Lenders

When states license any company, financial statements and business plans are required to be submitted to the regulator. When performed through NMLS, a record is created that can be used to determine market conditions and risk profiles of licensed companies. Accordingly, NMLS contains data that might be useful to regulators and policymakers alike.

In their letter requesting a fintech study, Senators Brown, Shaheen, and Merkley asked about the size and structure of fintech lending.²¹ The Senators stated, “[s]ince many fintech companies are privately held, information about the size of their portfolios is often not transparent.” It is true that private companies – including marketplace lenders and mobile wallet providers – are not obligated to release financial details. However, state-licensed companies are required to submit financial information to their regulators. State regulators use this information to make regulatory and supervisory decisions, and are glad to discuss portfolio information upon request.

¹⁷ For more information, see the SRR Annual Report. Available at <http://mortgage.nationwidelicensingsystem.org/about/Documents/2016%20SRR%20AR%20Report%20Web%20Version.pdf>.

¹⁸ Large multi-state companies engaged in electronic money transfer are likely licensed in 10 or more states without agents.

¹⁹ Large multi-state companies engaged in physical money transfer are likely licensed in 10 or more states with a significant number of agents that handle money from customers.

²⁰ Specialty MSBs are likely licensed in 1-state, often providing services to a particular community.

²¹ The letter is available at <http://www.brown.senate.gov/download/160418-sl-gao-fintech>.

NMLS 2.0

The Report notes “that the states are working on developing tools that can facilitate compliance with state-by-state licensing mechanisms, such as the Nationwide Mortgage Licensing and Registry System.” To clarify, the NMLS is already developed and has been operational for 9 years. However, work is currently underway to improve NMLS with a technological overhaul. Though the details are still under development, this project – NMLS 2.0 – will operate in real time, provide uniform data, establish a common framework, automate what is manual and routine, leverage data, and operate at the highest levels of data security. Through enhanced regulatory technology features, NMLS will improve compliance with state licensing requirements.²²

Conclusion

CSBS appreciates the opportunity to review the Report and submit this overview of the state regulatory system. Between the supervision actively occurring at licensed fintech companies and the information processed through the NMLS, the states are a prime source for information concerning the technology landscape for financial services. CSBS welcomes any opportunity to follow up on this Report or provide information that may be relevant in the fintech sector.

Sincerely,



John W. Ryan
President & CEO

²² For more information, see <http://mortgage.nationwidelicensingsystem.org/Pages/NMLS20Information.aspx>.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

GAO staff who made major contributions to this report include Harry Medina (Assistant Director), Lauren Comeau (Analyst in Charge), Namita Bhatia-Sabharwal, Chloe Brown, Pamela Davidson, Janet Eackloff, Cody Goebel, Davis Judson, Silvia Porres, Tovah Rom, Jessica Sandler, and Jena Sinkfield.

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