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Report to the Chairman, Committee on Financial Services, House of Representatives

September 2023

FINANCIAL TECHNOLOGY

Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices

GAO-23-106168

GAO Highlights

Highlights of GAO-23-106168, a report to the Chairman, Committee on Financial Services, House of Representatives

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FINANCIAL TECHNOLOGY

Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices

Why GAO Did This Study

Financial institutions are increasingly using financial technology. However, policymakers have raised questions about whether regulators' staff have the technological skills and expertise needed to oversee entities offering products and services that use this technology. GAO was asked to review regulators' financial technology expertise, among other issues. This report examines (1) the technological skills or expertise of regulators' staff, (2) regulators' workforce planning practices, (3) how regulators address innovation in financial technology, and (4) how regulators use technology to improve their supervisory capabilities.

GAO reviewed 181 position descriptions and documentation on regulators' workforce planning, innovation offices, and supervisory technology. GAO also conducted 16 focus groups with nongeneralizable samples of policymaking and oversight staff from each agency (90 total staff across the five agencies).

What GAO Recommends

GAO is recommending that all five agencies collect staff skillset data and fully incorporate leading workforce planning practices; that CFPB, NCUA, and OCC develop performance measures for their innovation offices; and that CFPB, the Federal Reserve, NCUA, and OCC develop performance measures for their supervisory technology strategic objectives. NCUA agreed with the recommendations. CFPB, FDIC, the Federal Reserve, and OCC did not agree or disagree with the recommendations, but indicated they would take actions to implement them.

View GAO-23-106168. For more information, contact Michael E. Clements at (202) 512-8678 or clementsm@gao.gov.

What GAO Found

Financial technology refers to the use of technology and innovation to provide financial products and services. The Consumer Financial Protection Bureau (CFPB), Federal Deposit Insurance Corporation (FDIC), Board of Governors of the Federal Reserve System, National Credit Union Administration (NCUA), and the Office of the Comptroller of the Currency (OCC) require many of their staff responsible for policymaking and oversight related to financial technology to have some level of technological skills, according to 181 position descriptions GAO reviewed. The skill requirements ranged from basic technological skills, such as knowledge of office software, to more specialized knowledge, such as expertise in data analysis. The agencies expressly required knowledge of financial technology in 18 of the position descriptions. GAO held focus groups with agency staff where less than half of the participants said they had financial technology-related skills.

The agencies have taken some steps to incorporate leading workforce planning practices identified by GAO in prior work. For example, all of the agencies have developed programs or provided training to help develop staff knowledge of financial technology. However, the agencies have not systematically or comprehensively collected data on their policymaking and oversight staff's technological skills related to financial technology or conducted assessments to determine the financial technology skills these staff need. The agencies also have not measured the effectiveness of their financial technology training in addressing their skill needs. By fully incorporating leading workforce planning practices, the agencies could help ensure their staff have the knowledge and skills needed to effectively conduct policymaking and oversight related to financial technology.

CFPB, NCUA, and OCC have offices dedicated to addressing innovation in financial technology or the financial industry more broadly. These innovation offices research and monitor industry developments and communicate with industry participants, such as through conference participation (though CFPB's and OCC's offices have recently paused or stopped some outreach and innovation-related activities). The three innovation offices, however, have not developed performance goals or measures that target their key activities. Doing so could help ensure the offices are better able to assess the effectiveness of their initiatives and the extent to which they are accomplishing their missions.

All of the regulators reported using a variety of technologies to improve their supervisory capabilities. Examples include a tool that reviews compliance with certain legal requirements and the use of machine learning techniques to help identify risk. Additionally, all of the regulators had at least one strategic objective focused on improving supervision with technology. However, CFPB, the Federal Reserve, NCUA, and OCC have not developed performance measures for these objectives. Doing so could better position the agencies to gauge their progress toward enhancing their supervisory capabilities through the use of technology.

Contents

Tables

Figures

Abbreviations

ACCESS	Advancing Communities through Credit, Education, Stability, and Support
CFPB	Consumer Financial Protection Bureau
FDIC	Federal Deposit Insurance Corporation
Federal Reserve	Board of Governors of the Federal Reserve System
fintech	financial technology
NCUA	National Credit Union Administration
OCC	Office of the Comptroller of the Currency
OPM	Office of Personnel Management

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

September 6, 2023

The Honorable Patrick McHenry
Chairman
Committee on Financial Services
House of Representatives

Dear Mr. Chairman:

Financial institutions are increasingly using technology and innovation to provide financial products and services (referred to as financial technology or fintech). However, the technology underlying financial technology products and services may present regulators with oversight challenges. These challenges may be exacerbated by the rapid pace at which the financial technology industry has grown and the evolving nature of the technology. These issues have raised questions among policymakers about whether regulators' staff have the technological skills and expertise needed to oversee entities that offer financial technology products and services, while also encouraging innovation.

You asked us to review the prudential regulators' and the Consumer Financial Protection Bureau's (CFPB) technological expertise related to financial technology, among other issues. The 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).[1]

This report examines (1) the technological skills or expertise related to financial technology policymaking and oversight that regulators' staff possess; (2) regulators' workforce planning processes to ensure their staff are sufficiently knowledgeable to engage in policymaking and oversight related to financial technology products and services and the extent to which those processes are consistent with leading practices; (3) how regulators address innovation in financial technology and measure

[1]We are separately reviewing similar issues regarding the Securities and Exchange Commission's technological expertise related to financial technology. We will issue a separate report based on that review.

the results of those efforts; and (4) how regulators use technology to improve their supervisory capabilities.[2]

To address the first objective, we reviewed agencies' position descriptions and job vacancy announcements.[3] We interviewed agency officials and held between two and four focus groups per agency with a sample of agency employees (for a total of 16 focus groups consisting of a total of 90 staff across the five agencies). Employees were selected based on position type (to obtain a mix of policymaking staff, examiners, and enforcement staff) and tenure, among other factors. Additionally, we conducted a literature review and interviewed representatives from a sample of seven industry associations and four members of one of the associations. We selected the associations to represent a range of regulated entities, among other factors. Information and views obtained from the focus groups and meetings with industry associations cannot be generalized to all staff within the agencies or all industry participants.

To address the second objective, we reviewed agencies' workforce planning documents for the primary offices responsible for policymaking and oversight related to financial technology, interviewed agency officials, and conducted focus groups (as described earlier). We then assessed the extent to which the agencies' workforce planning processes followed leading practices on workforce planning that we identified in prior work, with a specific focus on how the agencies' processes addressed financial technology.[4]

To address the third objective, we reviewed the agencies' annual performance plans, mission statements for their innovation offices, and related performance measures, where relevant. We also interviewed agency officials and the selected industry associations and members (as

[2]For the purposes of this report, policymaking refers to the development of rules, regulations, policies, and guidance. Oversight refers to the supervision of regulated institutions, including activities such as monitoring and examining and taking enforcement actions. Supervisory technology generally refers to innovative tools or techniques that regulatory agencies use to improve their supervisory capabilities.

[3]We reviewed agency documentation because the agencies do not collect data on staff's technological skills.

[4]GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: Dec. 11, 2003). The 2003 report identified key principles of strategic workforce planning. For purposes of this report, we refer to the principles as leading practices.

described earlier). We then assessed the extent to which the agencies used performance measurement best practices we identified in prior work.[5]

To address the fourth objective, we reviewed agencies' planning documentation for their supervisory technologies, such as information technology modernization and strategic plans. We also conducted a literature review. We then assessed the extent to which the agencies' plans addressed selected components of sound planning practices, which we identified in prior GAO work.[6] Appendix I provides more detailed information on our scope and methodology.

We conducted this performance audit from July 2022 to September 2023 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.

Background

Financial technology encompasses a broad range of products and services, which can be offered by banks or credit unions in partnership with financial technology companies.[7] Examples of products and services include, but are not limited to,

- loans to consumers and businesses made by using credit models that incorporate alternative data into credit decisions,
- payments made using mobile wallets,

[5]See, for example, GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118 (Washington, D.C.: June 1996), GAO, *The Results Act: An Evaluator's Guide to Assessing Agency Annual Performance Plans*, GAO/GGD-10-1.20 (Washington, D.C.: Apr. 1998), and GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 2023).

[6]GAO, *Combating Terrorism: Evaluation of Selected Characteristics in National Strategies Related to Terrorism*, GAO-04-408T (Washington, D.C.: Feb. 3, 2004).

[7]We define financial technology companies as companies that provide financial technology products and services and are not insured depository institutions, such as banks and credit unions. For example, a consumer may interact with an online platform created by a financial technology company through which a bank account or loan is offered.

- wealth management services using algorithms based on investors' data and risk preferences, and
- distributed ledger technology (such as blockchain) used to conduct and record transfers of digital assets.[8]

The federal prudential regulators—FDIC, the Federal Reserve, NCUA, and OCC—oversee their respective depository institutions (such as banks and credit unions) for safety and soundness and compliance with applicable laws and regulations.[9] Examinations or other supervisory activities can include assessing the institution's risk-management procedures related to third-party relationships with financial technology companies. Some prudential regulators may examine functions or operations that a third party performs on behalf of the institution.[10]

CFPB's statutory mission includes ensuring that markets for consumer financial products and services facilitate innovation, among other things. CFPB has supervisory authority for federal consumer financial laws with respect to insured depository institutions with assets of more than $10 billion and their affiliates, and certain nonbank institutions, which can

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[8]Alternative data refers to any information not traditionally used by the national consumer reporting agencies when calculating a credit score, such as rent and utility payments. Mobile wallets allow consumers to conduct transactions without having to enter credit or debit card information for each transaction. Distributed ledger technologies are a secure way of conducting and recording transfers of digital assets without the need for a central authority. It is "distributed" because multiple participants in a computer network (such as individuals and businesses) share and synchronize copies of the ledger. Blockchain is a type of distributed ledger technology where transactions are grouped together in blocks, which are cryptographically chained together.

[9]The Federal Reserve, FDIC, and OCC supervise institutions for which they are the appropriate federal banking agency as defined in the Federal Deposit Insurance Act. *See* 12 U.S.C. § 1813(q). NCUA supervises federally chartered credit unions and has certain oversight authorities with respect to federally insured, state-chartered credit unions, among others. *See, e.g.*, 12 C.F.R. pt. 741. With respect to federal consumer financial laws (defined below), the prudential regulators have supervisory authority for insured depository institutions with assets of $10 billion or less.

[10]*See* Interagency Guidance on Third-Party Relationships: Risk Management, 88 Fed. Reg. 37,920, 37,936-37 (June 9, 2023) (discussing supervisory reviews by the Federal Reserve, FDIC, and OCC). Separately, NCUA has the authority to review the internal controls and records of credit union service organizations (as defined at 12 C.F.R. § 712.1(d)).

include some financial technology companies.[11] Additionally, CFPB can examine companies—including financial technology companies—that act as service providers to bank and nonbank institutions subject to CFPB's supervisory authority.[12] In April 2022, CFPB announced plans to invoke its authority to supervise nonbank institutions whose activities CFPB has reasonable cause to determine pose risks to consumers, which could include financial technology companies.[13]

Regulators Developed Positions that Focused on Financial Technology, but Lack Data on Staff Technological Skills or Expertise

Regulators Have Developed Some Positions to Specifically Address Financial Technology

Policymaking and oversight responsibilities related to supervised entities' financial technology activities are shared among the offices, divisions, or other components within the prudential regulators and CFPB that are generally responsible for the supervision and regulation of financial

[11]CFPB also has rulemaking authority for federal consumer financial laws, the latter of which are more fully defined in section 1002(14) of the Consumer Financial Protection Act of 2010. Pub. L. No. 111-203, tit. X, § 1002(14), 124 Stat. 1955, 1957 (codified at 12 U.S.C. § 5481(14)). CFPB's authorities with respect to such laws are subject to certain exceptions. *See*, *e.g.*, 12 U.S.C. §§ 5517, 5519.

[12]*See, e.g.*, 12 U.S.C. §§ 5514(e), 5515(d), 5516(e). In general, a "service provider" means a person that provides a material service in connection with the offering or provision of a consumer financial product or service, subject to certain exclusions for general business support and advertising. 12 U.S.C. § 5481(26).

[13]*Consumer Financial Protection Bureau*, "CFPB Invokes Dormant Authority to Examine Nonbank Companies Posing Risks to Consumers" (Washington, D.C.: Apr. 25, 2022), https://www.consumerfinance.gov/about-us/newsroom/cfpb-invokes-dormant-authority-to-examine-nonbank-companies-posing-risks-to-consumers/.

institutions.[14] According to agency officials, the primary offices, divisions, or components are

- CFPB's Research, Monitoring, and Regulations Division and Supervision, Enforcement, and Fair Lending Division;
- FDIC's Division of Risk Management Supervision and Division of Depositor and Consumer Protection;
- The Federal Reserve's Division of Reserve Bank Operations and Payment Systems, Division of Supervision and Regulation, Division of Consumer and Community Affairs, and Legal Division;
- NCUA's Office of National Examinations and Supervision, Office of Examination and Insurance, Office of Consumer Protection, and Office of General Counsel; and
- OCC's Bank Supervision Policy, Chief Counsel, Large Bank Supervision, Midsize and Community Bank Supervision, and Supervision Risk and Analysis components.

The regulators have also established some positions, programs, or offices that focus specifically on financial technology. These include the following:

- CFPB's Senior Markets and Policy Fellow positions, which develop policy goals related to consumer financial services market areas, including consumer financial technology.
- FDIC's Emerging Technology Section, which involved developing new positions to bring in staff with subject matter expertise in areas related to financial technology, such as digital assets, artificial intelligence, machine learning, and third-party financial technology relationships.
- The Federal Reserve's System Fintech Supervision Program, a 3-year initiative established in December 2021 to develop and support

[14]Most of the regulators told us that staff in other offices may also be involved in financial technology policymaking and oversight because financial technology is widespread and may come up in multiple areas. However, agency officials agreed that these are the primary offices with policymaking and oversight responsibilities related to financial technology.

the implementation of a supervisory approach to address the rapid growth in firms' financial technology activities.[15]

- NCUA's Office of Financial Technology and ACCESS, which was established in January 2023 to serve as the principal advisor to the NCUA Board of Directors and Executive Director on financial technology, including how this technology can be used to enhance the agency's examination and supervision process and expand financial inclusion.[16]
- OCC's Office of Financial Technology, which was established in March 2023 and incorporates the Office of Innovation, which the OCC established in 2016. This office focuses on policy involving digital assets, artificial intelligence, machine learning, cloud adoption, financial technology partnerships, and other technologies and business models that are within or affect OCC's regulated institutions.

In addition to these efforts, regulators have established or participate in a number of internal and interagency working groups formally and as needed to address emerging and financial technology issues.[17] According to agency officials, these working groups are intended to serve as networks of support providing assistance, guidance, and knowledge

[15]According to Federal Reserve officials, the System Fintech Supervision Program is expected to be superseded by the newly established Novel Activities Supervision Program by the end of 2023. In August 2023, the Federal Reserve issued a Supervision and Regulation letter stating that the Federal Reserve had established the program to enhance the supervision of novel activities conducted by supervised banking organizations, with a focus on novel activities related to crypto assets; distributed ledger technology; and complex, technology-driven partnerships with nonbanks to deliver financial services to customers. Federal Reserve, *SR 23-7: Creation of Novel Activities Supervision Program*, (Aug. 8, 2023), https://www.federalreserve.gov/supervisionreg/srletters/SR2307.htm. According to officials, other Federal Reserve initiatives related to financial technology are the division of Supervision and Regulation's Business Technology Risk Section, which includes supervision of emerging technology, and the Operational Risk Executive Committee, which sets the direction of the Federal Reserve's information technology supervisory program and sets annual training priorities that have recently included financial technology.

[16]According to NCUA officials, Office of Financial Technology and ACCESS is the office's official name, and the acronym ACCESS stands for Advancing Communities through Credit, Education, Stability, and Support.

[17]These include internal working groups such as the Federal Reserve's Crypto Task Force, which is part of the System Fintech Supervision Program, and external groups such as the Interagency Artificial Intelligence/Machine Learning Working Group.

sharing to staff on technology-related matters, including financial technology.

Regulators Lack Data on Staff Technological Skills or Expertise, but Position Descriptions and Staff Indicate Skills Varied

The regulators told us they have not systematically collected data on the general technological skills or expertise of staff involved in policymaking and oversight. They also have not systematically or comprehensively collected data on technological skills related to financial technology, such as knowledge of machine learning or artificial intelligence.[18] The prudential regulators told us they may be able to collect data on staff skills on an as-needed basis for a specific position or office, or through the hiring process, but most regulators had not established a formal process for systematically identifying staff technological skills, as of July 2023.[19]

Because the regulators have not collected data on staff technological skills, we reviewed position descriptions and job vacancy announcements for positions agencies identified as being related to financial technology policymaking and oversight. We determined if the descriptions listed any required or desired technological skills.[20] We reviewed a total of 181 position descriptions and 30 job vacancy announcements from the prudential regulators and CFPB.[21]

[18]As discussed later in the report, FDIC and the Federal Reserve have collected some staff skillset data related to financial technology, but they have not collected complete data for their primary offices involved in policymaking and oversight related to financial technology.

[19]We discuss the importance of agencies collecting staff skillset data for purposes of workforce planning later in the report.

[20]We reviewed all sections of the position descriptions, including information about the positions' duties and responsibilities and competencies, to identify the technological skills that agencies required or preferred their staff possess. Technological skills related to financial technology can include knowledge of artificial intelligence (including machine learning), distributed ledger technology (including blockchain), cybersecurity, data analysis, data science, and software application and development, according to reports we reviewed and our interviews. These skills generally vary by the sector, product, or service provided by a financial institution.

[21]Position descriptions may not fully reflect the technological skills that staff currently possess. For example, agency staff may acquire technological skills and expertise through their job experience or with training, and actual staff skills may vary from those identified in position descriptions and vacancy announcements. The Federal Reserve provided 11 draft job vacancy announcements, which included technological skills such as data analysis and information technology. The announcements were not included in our review because the Federal Reserve provided the documents at the conclusion of our audit work.

Across all regulators, over half of the position descriptions and job vacancy announcements we reviewed included a requirement or preference that staff have one or more technological skills. The skills varied from basic technological skills, such as experience in the use of office software, to more specialized knowledge, such as expertise in data analysis. For example, NCUA's Risk Officer position required working knowledge of computer functions, while OCC's Bank Information Technology Lead Expert position required expertise in information security systems. CFPB's Technologist job vacancy announcement required experience with data analysis and software development.

The position descriptions and job vacancy announcements we reviewed collectively placed greater emphasis on data analytics and data science skills than on other types of technological skills.[22] Specifically, more than one-third of all the position descriptions and almost one-half of all job vacancy announcements listed a need for data analysis experience. Almost one-fifth of all the position descriptions and vacancy announcements required knowledge of data science.

Of the 181 position descriptions we reviewed, 18 included an explicit requirement or preference for knowledge of, or expertise in, financial technology, and the level of expertise sought by the agencies varied. For example, OCC's Deputy Comptroller and Chief Financial Technology Officer position required knowledge of financial technology, including artificial intelligence and machine learning, as well as knowledge of how financial technology partnerships operate. Other position descriptions, such as for the Federal Reserve's Financial Institution and Policy Analyst, and FDIC's Compliance Technology Specialist, included as a preference a general knowledge of the financial technology industry.

Three of the 30 job vacancy announcements we reviewed expressly required knowledge of financial technology—OCC's Deputy Comptroller and Chief Financial Technology Officer, NCUA's Director of Financial Technology and ACCESS, and FDIC's Chief, Emerging Technology Section, each of which required expertise in financial industry innovations.[23] Figures 1 and 2 summarize the technological skills included

[22]For the purpose of this report, information technology includes information technology support, network administration, information security, and information science needed to perform oversight duties. We excluded information technology skills required for positions related to internal operations.

[23]All three positions were filled in early 2023.

in the position descriptions and job vacancy announcements, respectively.

Figure 1: Types of Technological Skills Included in Regulators' Position Descriptions for Policymaking and Oversight Staff

	Regulators (number of reviewed position descriptions)					
Technological skill	**CFPB** (56)	**FDIC** (70)	**Federal Reserve** (14)	**NCUA** (30)	**OCC** (11)	**All regulators** (181)
Data analysis	18% 10	51% 36	71% 10	47% 14	9% 1	39% 71
Data science	7% 4	27% 19	21% 3	20% 6	0% 0	18% 32
Information technology	7% 4	19% 13	0% 0	17% 5	55% 6	15% 28
Fintech knowledge	7% 4	9% 6	21% 3	7% 2	27% 3	10% 18
Software /applications development	4% 2	13% 9	21% 3	10% 3	9% 1	10% 18
Cybersecurity	0% 0	10% 7	0% 0	23% 7	27% 3	9% 17
Artificial intelligence/ machine learning	5% 3	10% 7	14% 2	0% 0	9% 1	7% 13
Engineering	4% 2	7% 5	14% 2	0% 0	0% 0	5% 9
Blockchain/ distributed ledger	0% 0	4% 3	14% 2	3% 1	0% 0	3% 6
General technological skills	2% 1	7% 5	14% 2	10% 3	0% 0	6% 11
Any technological skills	30% 17	69% 48	86% 12	77% 23	82% 9	60% 109

CFPB: Consumer Financial Protection Bureau
FDIC: Federal Deposit Insurance Corporation
Federal Reserve: Board of Governors of the Federal Reserve System
NCUA: National Credit Union Administration
OCC: Office of the Comptroller of the Currency

Source: : GAO analysis of position descriptions. | GAO-23-106168

Notes: Only information technology skills needed for external (oversight) purposes are included here. Information technology skills needed for internal operations are excluded. The percentages will not add up to 100 because individual position descriptions can reference multiple skills.

Figure 2: Types of Technological Skills Included in Regulators' Job Vacancy Announcements for Policymaking and Oversight Staff

	Regulators (number of reviewed job vacancy announcements)				
Technological skill	**CFPB** (12)	**FDIC** (7)	**NCUA** (8)	**OCC** (3)	**All regulators** (30)
Data analysis	58% 7	43% 3	38% 3	33% 1	47% 14
Software/applications development	25% 3	29% 2	13% 1	0% 0	20% 6
Engineering	25% 3	43% 3	0% 0	0% 0	20% 6
Artificial intelligence/ machine learning	33% 4	14% 1	0% 0	33% 1	20% 6
Information technology	25% 3	14% 1	13% 1	33% 1	20% 6
Data science	25% 3	14% 1	0% 0	0% 0	13% 4
Fintech knowledge	0% 0	14% 1	13% 1	33% 1	10% 3
Cybersecurity	0% 0	0% 0	25% 2	0% 0	7% 2
Blockchain/ distributed ledger	0% 0	0% 0	13% 1	0% 0	3% 1
General technological skills	8% 1	0% 0	13% 1	0% 0	7% 2
Any technological skills	83% 10	57% 4	88% 7	67% 2	77% 23

CFPB: Consumer Financial Protection Bureau
FDIC: Federal Deposit Insurance Corporation
NCUA: National Credit Union Administration
OCC: Office of the Comptroller of the Currency

Source: GAO analysis of job vacancy announcements. | GAO-23-106168

Notes: Only information technology skills needed for external (oversight) purposes are included here. Information technology skills needed for internal operations are excluded. The percentages will not add up to 100 because individual job vacancy announcements can reference multiple skills. The Board of Governors of the Federal Reserve System provided us with drafts for 11 job vacancy announcements, which included technological skills such as data analysis and information technology. The announcements were not included in the figure because the Federal Reserve provided the documents at the conclusion of our audit work.

Regulators Said Financial Technology Requires Broad Skillsets and Staff Indicated More Technological Skills Would be Helpful

Prudential regulators and industry participants told us that working on financial technology issues requires a broader set of skills beyond the knowledge of certain technologies. For example, agency officials told us that examiners should also have skillsets that are technology-neutral, such as understanding credit and fraud risk, business processes, risk management, and applicable laws and regulations. Industry associations told us that the staff of their member organizations (banks, credit unions, and financial services firms) also need to have a broader range of skills and knowledge, including marketing experience, project management skills, knowledge of financial services regulations, and risk management.

We conducted focus groups with agency policymaking and oversight staff (including examiners and enforcement staff) to learn about the technological skills they possess, how they acquired those skills, and whether additional skills may be helpful in performing their jobs.[24] Less than half of the 90 employees that participated in the focus groups across all agencies stated that they possessed one or more technological skills, and the types of skills they cited varied by position and management level.[25] For example, two examiners in management positions told us they had knowledge of blockchain or distributed ledger technology, whereas 21 examiners in nonmanagement positions said they had this skill. Seven out of 19 (about 37 percent) of policymaking staff, all of whom were in management positions, said they had data science or analysis skills. Some agency staff reported having other technological skills, including knowledge of digital assets, information technology, and payment systems (see fig. 3).

[24]We asked agency staff whether they had any financial technology skills within five categories. We identified those categories through reports we reviewed and our interviews with the prudential regulators, CFPB, and industry participants. The categories of skills we asked about were software/application development, data science/data analysis, cybersecurity, knowledge of artificial intelligence/machine learning, and knowledge of blockchain/distributed ledger technology. We also included an option to capture “other” technological skills not expressly listed in the categories. Staff were able to select more than one skill category. Information gathered from agency staff that participated in the focus groups cannot be generalized to all agency staff.

[25]We obtained this information by polling staff during the focus groups. We did not assess the appropriate level or type of technological skills that agency staff should have, which was outside of the scope of this review.

Figure 3: Self-reported Technological Skills of Prudential Regulators' and Consumer Financial Protection Bureau Staff

Function (number of responses)		Software/application development	Data science/ data analysis	Cybersecurity	Knowledge of artificial intelligence/ machine learning	Knowledge of block chain/distributed ledger technology	Other
		Technological skills self-reported by agency staff					
Examinations	(17)	6% 1	18% 3	18% 3	18% 3	12% 2	41% 7
	(46)	30% 14	26% 12	41% 19	39% 18	46% 21	28% 13
Enforcement	(2)	0% 0	0% 0	50% 1	50% 1	50% 1	50% 1
	(1)	0% 0	0% 0	0% 0	0% 0	0% 0	100% 1
Policymaking	(19)	11% 2	37% 7	21% 4	47% 9	47% 9	47% 9
Total responses	(85)	20% 17	26% 22	32% 27	36% 31	39% 33	36% 31

Management

Nonmanagement

Source: GAO analysis of poll responses. | GAO-23-106168

Notes: We asked agency staff whether they had any financial technology skills within five categories. We identified those categories through reports we reviewed and our interviews with agency officials and industry participants. We also included an option to capture "other" technological skills not expressly listed in the categories. Skills in the "Other" category include knowledge of digital assets, payment systems, and third-party relationships. Staff were able to select more than one skill category. Information gathered from agency staff that participated in the focus groups cannot be generalized to all agency staff.

We also polled agency staff that participated in the focus groups about how they acquired their technological skills. Over two-thirds of the participants said "on-the-job experience" (the most common response for all positions), and over half said internal training. Staff also told us they acquired skills from participating in working groups, getting help from subject matter experts within their agencies, and working with the entities they supervise. However, management and nonmanagement examiners also told us there were not enough in-house subject matter experts available to them.

Regulators' staff in 15 of the 16 focus groups (including staff from all the regulators we reviewed) told us they have encountered situations in which having additional technological skills would have been helpful to more effectively do their jobs. Focus group participants from three agencies (including management and nonmanagement staff) told us these situations occurred often or periodically. Two policymaking and one examiner staff in management positions in two of the agencies indicated these situations occurred frequently. Staff generally told us they leveraged resources at their disposal when they encountered these situations. For example, focus group participants from all the regulators told us they turned to subject matter experts within their agencies for assistance.

Some policymaking and oversight staff that participated in the focus groups told us that while they do not expect to be experts on the development of financial technology, they do need to understand how that technology works and how it can present risks to financial institutions and consumers. Staff cited some of the skills or expertise that would be helpful to them in performing their jobs. These included a better understanding of financial technology services and products, the risks that financial technology may present to consumers and financial institutions, and how institutions manage those risks. Staff also mentioned additional knowledge in specific technology-related areas such as information technology, distributed ledger technology (e.g., blockchain), and digital assets.

Industry participants we interviewed, including financial technology firms and banking associations, said the regulatory staff they engaged with had varying levels of technological skills.[26] For example, one industry association that represents financial technology firms told us skills of regulatory staff vary depending on the focus of their supervisory activities and the extent of their engagement with financial technology entities. One association that works with credit unions told us that examiners' skills vary widely depending on the examination team. For example, specialist examiners have the skills to understand both the technical aspects and business side of the operation, but nonspecialist examiners may not.[27]

However, five industry associations we interviewed indicated that regulators may be either missing or falling behind in the knowledge of some technologies, such as distributed ledger technology (e.g., blockchain), machine learning, or the use of consumer data. One financial

[26]The types of technological skills that regulators' staff need may not necessarily reflect the type or level of technological skills that regulated entities need. For example, Federal Reserve officials told us that regulatory staff may need different skills than staff at the regulated entities because the regulator is involved in making policy, which requires a different combination of skillsets than would be required in the private sector. One banking association told us that regulators and banks have different perspectives on technology—banks are more focused on using technology as a delivery tool, and regulators are more focused on the risk.

[27]Regulators may have examiners who are subject matter experts in areas such as capital markets, information security, and fraud. Other examiners are generalists.

technology firm and one industry association also told us that having a greater understanding of a technology's basic concepts could increase regulators' effectiveness in overseeing products and services using that technology.

Regulators Partially Followed Workforce Planning Leading Practices, but Have Not Fully Identified Needed Skills

Regulators Have Not Fully Identified Skill Needs Related to Financial Technology Policymaking or Oversight

The prudential regulators and CFPB have noted the importance of keeping pace with financial technology. The prudential regulators have stated in their strategic plans or risk management documents that it is important that they adequately prepare staff to address financial technology in their supervision of financial institutions. CFPB, the Federal Reserve, and OCC have also stated that their policymaking and oversight staff need to have some understanding of the technology underlying financial technology products and services. Similarly, FDIC said it aims to maintain a highly skilled workforce, which includes ensuring appropriate policymaking and oversight staff have an understanding of financial technology.

Our prior work suggests that an agency's human capital management approach should incorporate five leading practices, regardless of agency mission.[28] These leading practices can enhance the effectiveness of an agency's strategic workforce planning by helping the agency focus on the issues it needs to address and the information it needs to consider.[29] Additionally, federal internal control standards state that agencies should

[28]GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: Dec. 11, 2003). The 2003 report identified key principles of strategic workforce planning. For purposes of this report, we refer to the principles as leading practices.

[29]Strategic workforce planning focuses on aligning an organization's human capital program with its current and emerging mission and programmatic goals and developing long-term strategies for acquiring, developing, and retaining staff to achieve programmatic goals.

demonstrate a commitment to recruit, develop, and retain competent individuals, which can include establishing the knowledge, skills, and abilities needed for key roles.[30]

We found that the regulators generally or partially followed most leading practices in their workforce planning to ensure staff have the knowledge and skills needed to oversee the use of financial technology by regulated entities (see table 1).[31]

Table 1: Extent to Which Agencies Followed Leading Workforce Planning Practices for Financial Technology Policymaking and Oversight Staff, as of June 2023

Leading workforce planning practices	Consumer Financial Protection Bureau	Federal Deposit Insurance Corporation	Board of Governors of the Federal Reserve System	National Credit Union Administration	Office of the Comptroller of the Currency
Conduct strategic workforce planning that involves top management, employees, and other stakeholders.	○	●	●	◐	●
Determine critical skills and competencies needed to achieve current and future programmatic results.	◐	◐	◐	◐	◐
Develop workforce planning strategies designed to address gaps in critical skills and competencies.	◐	◐	◐	◐	◐
Build administrative and other capabilities to support workforce planning strategies.	●	●	●	●	●
Monitor and evaluate progress toward human capital goals and programmatic results.	◐	◐	◐	◐	○

Legend:

● Generally followed – Agency's actions followed all or most aspects of the leading practice

◐ Partially followed – Agency's actions followed some, but not most aspects of the leading practice

○ Did not follow – Agency's actions did not follow any aspects of the leading practice

Source: GAO analysis of agency information. I GAO-23-106168

Notes: This analysis focuses on the agencies' primary offices or divisions involved in policymaking and oversight related to financial technology. For additional information on the leading workforce

[30]GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: Sept. 2014).

[31]Our analysis focused on the regulators' primary offices or divisions that agency officials identified as being responsible for oversight and policymaking related to financial technology. Specifically, we assessed the extent to which these offices or divisions followed leading workforce planning practices with a specific focus on how their practices addressed financial technology.

planning practices, see GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: Dec. 11, 2003).

As discussed below, while the prudential regulators and CFPB have taken several steps to implement leading workforce planning practices, they have not fully identified their skill needs related to financial technology or measured the effectiveness of their financial technology training. For a more detailed discussion of the regulators' actions related to these practices, see appendix II.[32]

- **Conduct strategic workforce planning.**[33] FDIC, the Federal Reserve, and OCC have generally followed this practice. FDIC has engaged in strategic workforce planning related to financial technology as part of its enterprise risk management program.[34] For example, FDIC has identified several financial technology-related risks to the agency, such as the potential for not being equipped to effectively supervise financial institutions if it does not stay abreast of technology advances and financial technology products and services used in the financial industry. FDIC developed mitigation strategies to address these risks, such as supporting continuous learning and knowledge sharing related to financial technology. The Federal Reserve and OCC have conducted strategic workforce planning related to financial technology by incorporating objectives aimed at enhancing the agencies' knowledge of financial technology in their agencywide strategic plans, among other actions.

  NCUA has partially followed this practice by incorporating a strategic objective that addresses workforce planning related to financial technology into its agencywide strategic plan. However, NCUA's 2022–2026 strategic human capital plan does not address financial technology and officials told us NCUA's new Office of Financial

[32]We present illustrative examples of the agencies' actions related to each leading practice for the purposes of this report.

[33]This practice includes ensuring that top management sets the overall direction and goals of workforce planning and involves employees and other stakeholders (such as agency managers and supervisors) in developing and implementing future workforce strategies.

[34]According to FDIC's 2021 annual report, FDIC's agencywide risk management program has made an effort to identify and assess financial, reputational, and operational risks and incorporate corresponding controls into day-to-day operations. The program requires that divisions and offices document comprehensive procedures, thoroughly train employees, and hold supervisors accountable for performance and results. FDIC divisions and offices monitor compliance through periodic management reviews and various activity reports distributed to all levels of management. FDIC, *2021 Annual Report* (Washington, D.C.: 2022).

Technology and ACCESS has not yet participated in NCUA's workforce planning process.[35] NCUA officials told us this office has not been established long enough to implement workforce planning processes related to financial technology.[36]

CFPB has not engaged in strategic workforce planning specific to positions involved in financial technology policymaking and oversight. CFPB officials said CFPB has not yet developed a new human capital plan that identifies the agency's human capital priorities because a new Chief Human Capital Officer and Chief Operating Officer have only recently joined CFPB.

- **Determine critical skills.**[37] All of the regulators have partially followed this practice. For example, all the regulators have identified some skill or knowledge requirements related to financial technology in position descriptions. Additionally, the Federal Reserve has collected some financial technology skillset data and identified some financial technology skill gaps. FDIC surveyed staff in one of its divisions to gather information about staff financial technology knowledge, experience, and interest. However, none of the regulators have systematically or comprehensively collected data on the technological skills or expertise related to financial technology that their staff possess, which would provide the regulators with a baseline reference of their staff's skillsets and a starting point for determining skill needs. The regulators cited various reasons for not collecting data, including challenges with data collection and finding it more useful and practical to collect data for a specific position or office

[35]This office focuses in part on addressing innovation in financial technology, and in the future plans to play a role in providing resources and training for supervisory staff, including examiners, according to officials.

[36]According to officials, this office will begin participating in workforce planning in 2024. NCUA's strategic workforce planning process involves analyzing the current workforce, forecasting future needs, identifying existing or potential gaps, and determining human capital priorities through the appropriate composition of staffing levels, positions, competencies, and skills.

[37]This practice involves agencies determining the skills and competencies that are critical to successfully achieving their missions and goals. The practice emphasizes that it is essential for agencies to determine the critical skills and competencies that will be needed to achieve both current and future programmatic results, particularly as changes occur in technology and other areas.

rather than a broad skills inventory.[38] In addition, none have conducted an assessment to fully determine the critical financial technology skills needed for their policymaking and oversight staff.[39] The regulators cited competing human capital priorities, among other reasons, for not conducting an assessment to identify their skill needs.[40]

- **Develop strategies to address skills gaps.**[41] All of the regulators partially followed this practice. For example, in 2021, Federal Reserve officials developed the System Fintech Supervision Program in response to gaps the Federal Reserve identified related to how the agency approached financial technology. The program aims to facilitate knowledge sharing, build subject matter expertise, and train examiners. CFPB and FDIC have also developed programs to build

[38]CFPB officials told us CFPB has not identified a need for collecting staff financial technology skillset data. FDIC officials stated that FDIC trains examination staff to be generalists, but has a process to identify subject matter experts and hire staff into specialized positions with expertise in financial technology as needed. Federal Reserve officials said the Federal Reserve has collected skillset data for training purposes in the past, but stopped doing so because the data were not being used and collecting data as needed for a specific position or office was more useful and practical than a broader skills inventory. NCUA officials told us the agency's Office of Financial Technology and ACCESS is new and that NCUA is currently conducting competency and job analysis work that may involve gathering financial technology skillset information. OCC officials cited challenges with collecting meaningful and actionable data over the course of its 2-year cycle for establishing technical competency elements and measuring skillset data before new skillsets would be needed due to changing technology.

[39]For additional information on the regulators' efforts to identify financial technology-related skill needs, see app. II.

[40]CFPB officials stated that the agency has not identified a need to define competencies specific to financial technology and it believes that its current competencies are sufficient to ensure staff are appropriately addressing financial technology-related issues. FDIC officials told us FDIC has identified skill needs in areas such as artificial intelligence and crypto assets. Officials also said FDIC has a small, newly established human capital strategy team responding to competing human capital priorities, and with additional resources can begin addressing technical skills for financial technology. Federal Reserve officials told us that they conduct targeted skill assessments when needed. NCUA officials told us the agency's new Office of Financial Technology and ACCESS has not been established long enough to implement workforce planning processes. OCC officials told us OCC is currently updating its job analysis for entry-level hires, which will enable OCC to assess applicants' technical competence as part of the selection process.

[41]Applying this leading practice to strategic workforce planning means that agencies (1) develop hiring, training, staff development, succession planning, and other human capital strategies and tools that can be implemented with the resources that can be reasonably expected to be available, and (2) consider how these strategies can be aligned to eliminate gaps and improve the contribution of critical skills and competencies.

subject matter expertise within the agencies, and NCUA and OCC have established working groups to facilitate knowledge sharing.[42] All the regulators also have provided staff with financial technology training. However, as discussed earlier, because the regulators have not conducted an assessment, they have not fully identified their financial technology skill needs, which is a necessary first step for fully developing strategies specifically targeted to address any staff skill gaps related to financial technology.

- **Build capabilities to support workforce planning.**[43] All of the regulators have generally followed this practice. For example, CFPB used existing hiring authority to develop its Technologist program, according to officials. CFPB officials told us the program consists of term positions, which are designed to bring skills and expertise to CFPB through fellowships or other term appointments to support time-bound initiatives. OCC officials told us OCC has Schedule B excepted service appointment authority for examiners and Schedule A excepted service appointment authority for attorneys.[44] FDIC and the Federal Reserve participate in hiring programs, such as the federal

[42]For example, in February 2022, CFPB developed a Technologist program that embeds staff with technical expertise within CFPB's supervision and enforcement teams. In 2021, FDIC's Depositor and Consumer Protection division developed the Consumer Compliance Technology Specialist Program aimed at expanding technical knowledge and supervision capabilities of emerging technologies as they are adopted in financial services through the use of program specialists. NCUA established a working group called the Digital Assets Working Group to facilitate knowledge sharing related to financial technology. OCC has an artificial intelligence working group that arranges presentations from outside speakers, including vendors, about financial technology products.

[43]This practice includes making effective use of human capital flexibilities (which refers to the policies and practices that an agency has the authority to implement in managing its workforce, such as hiring authorities) and streamlining and improving administrative processes.

[44]According to an Office of Personnel Management website, federal government civilian positions are generally in the competitive civil service. To obtain a competitive service job, individual applicants must compete with other applicants in open competition. The Office of Personnel Management provides excepted service hiring authorities in certain circumstances under Schedules A, B, C, and D. Excepted service hiring authorities enable agencies to hire when it is not practical to use traditional competitive hiring procedures, among other things. Office of Personnel Management, "Excepted Service," website, accessed July 13, 2023, https://www.opm.gov/policy-data-oversight/hiring-information/excepted-service/.

CyberCorps scholarship program, according to officials.[45] NCUA officials told us the agency hired a recruitment firm to assist in recruiting for the Director of Financial Technology position after facing some difficulties filling the position. Officials said NCUA also has conducted outreach to universities and posted on jobsites to recruit other positions for NCUA's Office of Financial Technology and ACCESS.

- **Monitor and evaluate progress.**[46] Four of the regulators have partially followed this practice, and one regulator has not followed this practice. For example, FDIC is tracking the completion of mitigation strategies the agency developed to address agency risks related to human capital and financial technology. CFPB and the Federal Reserve have reviewed the progress of the programs they developed that address financial technology, according to officials.[47] NCUA also monitors its progress toward achieving its strategic objective on financial technology in its annual performance plan. However, OCC does not currently have any workforce planning performance goals or measures, according to officials. OCC officials told us this is because OCC is in the process of developing new goals and measures to reevaluate the skill proficiencies of several occupational series.

  Additionally, none of the regulators have developed performance measures for or evaluated the effectiveness of their financial technology training in addressing their financial technology skill needs. CFPB and FDIC officials told us their agencies have not done so because they obtain feedback from training participants and believe this feedback is sufficient to assess their training. However,

[45]The CyberCorps Scholarship for Service program was created in 2000 to enhance the security of critical information infrastructure, increase the national capacity of educating IT specialists in Information Assurance disciplines, produce new entrants into the government Information Assurance workforce, increase national research and development capabilities in Information Assurance, and strengthen partnerships between institutions of higher learning and relevant employment sectors. CyberCorps Scholarship for Service website, accessed July 13, 2023, https://sfs.opm.gov/About/History.

[46]This practice involves measuring the outcomes of human capital strategies and how these outcomes have helped organizations accomplish their missions and goals. For example, performance measures can be used to indicate whether the agency executed its hiring, training, or retention strategies as intended and achieved the goals for these strategies, and how these initiatives changed the workforce's skills and competencies.

[47]For example, in 2021 and 2022, the Federal Reserve reviewed the structure of the System Fintech Supervision Program and its work plan, according to officials. CFPB officials told us that staff in the Technologist program are subject to performance standards.

the agencies have not fully identified their financial technology skill needs and therefore cannot fully assess the effectiveness of their training in addressing those needs. Federal Reserve officials cited the fast-paced nature of financial technology as a challenge to developing measures for assessing the effectiveness of the Federal Reserve's financial technology training.[48] NCUA officials cited the recent establishment of its Office of Financial Technology and ACCESS as a factor for not fully implementing this and other workforce planning practices. Finally, OCC officials told us that OCC is continuing to formalize its financial technology technical competency elements and proficiency targets, and noted that the rationale for measuring or evaluating training is to understand how it helps maintain and expand skillsets defined in such elements and targets.

Financial institutions, including banks and credit unions, are increasingly using financial technology to offer products and services. Further, the complexity and potential risks of the technology underscore the importance of regulatory staff having sufficient knowledge and skills to oversee its use by regulated entities. By fully incorporating leading workforce planning practices, the agencies could help ensure their staff have the knowledge and skills they need to effectively develop policy and conduct oversight related to financial technology.

Some Staff Said They Faced Challenges Obtaining Knowledge and Skills, Including Access to or Time for Training

As discussed earlier, focus group participants across all of the regulators noted that they had experienced novel or challenging situations for which additional technological skills and expertise could have been useful. For example, staff in one group noted it would have been helpful to have more knowledge about coding when analyzing an institution's data and staff in another group said it would be helpful to know about artificial intelligence and machine learning when conducting examinations. Staff in

[48]While developing such measures can be challenging, they could help ensure the Federal Reserve's financial technology training is achieving its intended results. Our past work has also highlighted strategies agencies can use to overcome these challenges, such as surveying the intended audience to ask about changes in knowledge and selecting outcomes closely associated with the program. See GAO, *Program Evaluation: Strategies for Assessing How Information Dissemination Contributes to Agency Goals*, GAO-02-923 (Washington, D.C.: Sept. 30, 2002). We have also reported on regulators' use of outcome-oriented performance measures in other areas, including related to training. See GAO, *Banking Services: Regulators Have Taken Actions to Increase Access, but Measurement of Actions' Effectiveness Could Be Improved*, GAO-22-104468 (Washington, D.C.: Feb.14, 2022).

some focus groups expressed a need for additional training in financial technology.

However, focus group participants across all the agencies cited challenges in obtaining the financial technology training or resources they need.[49]

- **Training was unavailable when needed**. Staff in one CFPB group, one OCC group, and one FDIC group noted instances when they needed training that was not available. For example, staff in the CFPB group cited difficulty getting external training and staff in the OCC group said training can be delayed and hard to find.
- **Access to subject matter experts was limited.** Staff in two FDIC focus groups, one Federal Reserve group, one CFPB group, and one OCC group said access to specialists or subject matter experts was limited because the regulators did not have enough of them.
- **Staff did not have enough time for training.** Staff in three FDIC groups, two OCC groups, one Federal Reserve group, and one NCUA group told us they did not have enough time in their schedules to take training. Some focus group participants cited their workloads and staff shortages as factors that prevented them from taking the training they needed.

Focus group participants also identified potential steps their agencies could take to address the training or resources challenges they cited. For example, staff in two FDIC groups, two NCUA groups, one CFPB group, and one Federal Reserve group told us the regulators could provide additional or better quality financial technology training. For example, staff in the CFPB group said they would prefer training from external financial technology experts and noted that CFPB should ensure the trainer has the skills and knowledge to provide the training. Additionally, staff in one Federal Reserve group, one NCUA group, and one OCC group noted their agencies could do a better job of informing staff about the training or resources available to them.

[49]We conducted a total of 16 focus groups with staff across all the regulators. Specifically, we conducted two focus groups each with CFPB and OCC, and four focus groups each with FDIC, the Federal Reserve, and NCUA. We conducted fewer focus groups with CFPB and OCC due to agency staff availability.

Regulators Have Addressed Financial Industry Innovation in Various Ways, but Have Not Measured Results

Most Regulators have Dedicated Innovation Offices, Which Are New or Have Recently Changed in Scope and Purpose

Three of the five regulators we reviewed have offices—which we refer to collectively as innovation offices—dedicated to addressing innovation in the financial industry (see table 2).

Table 2: Overview of Agency Offices of Innovation and Precursors

Agency	Office name	Location within agency	Created	Purpose
Current offices of innovation				
CFPB	Office of Competition and Innovation	Research, Monitoring, and Regulations Division	May 2022[a]	To promote competition and innovation that benefits consumers in the financial products and services market.
NCUA	Office of Financial Technology and ACCESS	Office of the Executive Director	January 2023	To advise NCUA board and executive directors on financial technology, represent NCUA at events, oversee technological methods for making examinations more effective and efficient, manage NCUA's ACCESS program[b], and plan outreach and innovation programs.
OCC	Office of Financial Technology	Bank Supervision Policy Division	March 2023[c]	To expand on the work of the prior Office of Innovation with a focus on financial technology and partnerships between banks and financial technology companies by analyzing and evaluating trends, emerging risks, and potential implications for bank supervision.
Precursory offices or initiatives				
CFPB	Office of Innovation	Office of the Director	July 2018	To encourage consumer-friendly innovation and promote competition, innovation, and consumer access within financial services.

Agency	Office name	Location within agency	Created	Purpose
OCC	Office of Innovation	Bank Supervision Policy Division	October 2016	To encourage sound innovation by serving as an outreach and technical assistance program for banks and nonbanks, develop training activities for OCC staff, encourage coordination and facilitation, establish an innovation research function, and promote interagency collaboration.
CFPB	Project Catalyst	Office of the Director	November 2012	To encourage marketplace innovation so that new and emerging products can be developed that are safe and beneficial for consumers.

Source: GAO analysis of agency documentation. I GAO-23-106168

[a]The Office of Competition and Innovation replaced CFPB's prior Office of Innovation, which opened in 2018.

[b]ACCESS is an acronym that stands for Advancing Communities through Credit, Education, Stability, and Support.

[c]The Office of Financial Technology incorporated OCC's prior Office of Innovation, which was established in 2016.

The offices aim to address innovation through direct outreach to industry participants separate from their agencies' role in examining regulated entities or other oversight and supervision processes. For example, according to agency officials and documentation we reviewed, the innovation offices stay abreast of new technologies, companies, or partnerships through research and monitoring of industry developments, which allows them to target outreach to specific types of companies. The innovation offices also may contribute to agency policymaking and oversight processes by serving as subject matter experts and advisors.

Some of the agencies have made recent changes to their innovation offices. Specifically, CFPB and OCC changed the scope or purpose of their innovation offices within the last 2 years, and NCUA established its first innovation office in January 2023.

- **CFPB's Office of Competition and Innovation.** CFPB established its first Office of Innovation in 2018 with the purpose of creating policies to facilitate innovation, engaging with entrepreneurs and other regulators, and reviewing outdated or unnecessary regulations.[50] According to an agency announcement, in May 2022 CFPB established a new iteration of the office that broadened the mission of the prior office. The new office added a focus on analyzing obstacles to open markets, understanding the competitive effects that large companies may have on smaller ones, and making it easier for people to switch financial service providers. CFPB changed the name to the Office of Competition and Innovation and moved it from the Office of the Director to the Research, Monitoring, and Regulations Division.

- **OCC's Office of Financial Technology.** OCC established its first Office of Innovation in 2016.[51] OCC established a new office called the Office of Financial Technology in March 2023, which expands the scope of its Office of Innovation by specifically focusing on financial technology and enhancing OCC's expertise in that area. This will involve analysis, evaluation, and discussion of trends in financial technology, including emerging risks and the potential implications for OCC's supervision. The office is to continue its work on outreach, research, and providing insight on innovation and financial technology to other OCC staff. But officials noted that the new office will add to OCC's ability to monitor financial technology by broadening its focus on nonbank financial companies, including those focused on financial technology who partner with banks. Officials emphasized the importance of focusing on financial technology given the recent expansion of and developments in financial innovation.

[50]The work conducted by CFPB's Office of Innovation was preceded by an initiative called Project Catalyst, which launched in November 2012 and focused on encouraging marketplace innovation with an emphasis on emerging products that would be safe and beneficial for consumers. Project Catalyst worked toward those goals by establishing communication channels with stakeholders (including financial technology companies, traditional financial institutions, consumer advocacy organizations, academics, and others), developing programs and policies to support innovation, and engaging in pilot projects and research collaborations.

[51]The office's purpose was to implement OCC's then-recently developed framework for responsible innovation. According to officials and documentation we reviewed, this included conducting outreach and providing technical assistance to bank and nonbank industry participants, training and knowledge sharing for OCC staff, coordinating and facilitating innovation-related decisions within the agency, collaborating with other regulators, and conducting research.

Access to Financial Products and Services for Underserved Consumers

We have previously reported about how underserved communities can face difficulty accessing financial products and services. Underserved consumers can include

- unbanked households, in which no one has checking or savings accounts;
- underbanked households, which have used nonbank financial products or services, such as payday loans, in the past 12 months; or
- credit-invisible consumers, who lack credit scores due to insufficient or nonexistent credit records.

Our prior reporting found that financial technology products could offer benefits to these types of consumers, such as digital deposit accounts, small-dollar loans based on alternative data not found in traditional credit reports, or platforms that offer access to wages earned but not yet paid. However, we also found that these products posed risks, such as confusion over how to access funds if a company goes out of business or fees that are not transparent.

Source: GAO. | GAO-23-106168

- **NCUA's Office of Financial Technology and ACCESS.** NCUA's Office of Financial Technology and ACCESS is the agency's first innovation office. It was founded in January 2023 to serve as principal advisor to the NCUA board on agency policy related to financial technology and keep abreast of developments and transformation in the financial services sector.[52] According to officials, the office will also conduct outreach to industry participants. The office's purposes also include exploring methods to enhance NCUA's virtual examination and supervision processes. Additionally, the office is to deploy new technologies or innovations that can expand financial inclusion and equitable consumer access in the credit union system, as part of NCUA's broader ACCESS initiative. NCUA's focus on inclusion and disparities in minority, underserved, and unbanked populations within the Office of Financial Technology is unique among the innovation offices. A program coordinator in the office will oversee that effort.[53]

FDIC currently does not have a dedicated innovation office that conducts outreach to industry participants, but it does have an office that focuses on technology. In March 2019, FDIC established FDITECH with a mission focused on engaging and collaborating with the private sector to support innovation that promotes economic inclusion, consumer protection, competition, and identification of risk. The mission also aimed to facilitate internal FDIC understanding, development, and adoption of technologies to improve FDIC operations. In January 2023, FDIC eliminated the portion of the office's mission focused on fostering innovation within the financial sector, and will now only focus on adoption of technologies within FDIC, such as small automation solutions to enhance workflow. According to FDIC, this new mission better integrates FDITECH within FDIC's overall internal technology framework. Along with the change in mission, FDITECH was reorganized as a branch within the agency's Division of Information Technology and no longer focuses on external competition or innovation within the financial sector. While FDIC does not have a central innovation office, officials noted they engage with industry participants

[52]NCUA did not have a prior office of innovation focused on industry outreach, but it has an Office of Business Innovation focused on innovation internal to NCUA, such as agency business processes and supervisory technology.

[53]NCUA's ACCESS Initiative, which stands for Advancing Communities through Credit, Education, Stability, and Support and spans multiple offices, seeks to foster financial inclusion and address the financial disparities experienced by minority, underserved, and unbanked populations. The initiative has a stated objective of helping to develop policies and programs in support of financial inclusion within the NCUA and the credit union system by addressing the financial services, financial literacy, and employment needs of diverse, underserved, and unbanked communities.

across a range of divisions, offices, and positions that are separate from examinations. For example, multiple FDIC divisions work with technology service providers to improve access to loan image files, according to officials. While FDITECH staff are involved in these activities for their expertise, they are not primarily responsible for outreach to industry.

Federal Reserve officials told us the Federal Reserve does not have one single innovation office, but that various divisions and offices address different aspects of innovation and conduct outreach as needed. For example, the System Innovation Office coordinates across the Federal Reserve and Reserve Banks on innovation related to supervision and regulation and developing technological expertise relevant to the Federal Reserve, such as expertise on payments technology, according to officials. Additionally, the Federal Reserve's TechLab is a unit within the Division of Reserve Bank Operations and Payment Systems focused on understanding specific technologies through experimentation and research, broadening technical expertise across the Federal Reserve System, and supporting policy and oversight frameworks.[54] According to officials, these and other divisions and offices conduct outreach to the industry, such as hosting and participating in conferences or taking part in face-to-face meetings and information-sharing sessions.[55]

The agency innovation offices regularly communicate and coordinate with each other, according to agency officials, such as through routine meetings.[56] The offices have also participated jointly on panels or presentations to industry and worked collectively on interagency bodies that develop policy for industry participants (such as the Federal Financial Institutions Examination Council and the Financial Stability Oversight Council). In addition, some offices have participated in policy sprints

[54]Additionally, all Federal Reserve Banks, except the Federal Reserve Bank of Boston and Federal Reserve Bank of Minneapolis, had teams, groups, or communities that address some aspect of financial technology. However, individual Federal Reserve Banks were outside the scope of our review.

[55]As previously mentioned, in addition to technology-focused offices and innovation offices, agencies used a variety of cross-functional groups—such as working groups, task forces, and programs—to address innovation. These groups are focused on developing agency technological expertise and knowledge for supervision purposes.

[56]Relevant FDIC and Federal Reserve divisions similarly coordinate, according to officials.

designed to develop coherent interagency positions or guidance on topics related to financial technology, such as crypto assets.[57]

Officials at one agency noted that these coordination activities had decreased recently due to the offices' refocusing. Another agency said they were hopeful coordination would increase once the newly formed offices became more established.

Innovation Offices Used Multiple Methods to Engage with Industry Participants, but Are Currently Refocusing Efforts

Agencies' innovation offices have engaged directly with industry participants in a variety of ways:[58]

- **Office hours.** All three agencies' innovation offices have held or plan to hold periodic open office hours as opportunities to discuss new financial technology products or services, partnerships between financial technology companies and banks, and other innovation-related topics.[59]
- **Meetings with industry participants.** All the innovation offices said they hold unplanned meetings, which may be initiated by regulators or industry participants, to discuss specific events, technologies, or questions. These meetings can help inform regulated entities about legal compliance and help agencies stay current on issues affecting innovators, according to officials.
- **Industry event participation.** All the innovation offices said they participate in industry events, such as technology conferences, where they may speak on panels or meet with industry participants.
- **Technology sprints.** CFPB has conducted technology sprints (tech sprints), which bring relevant agency staff and consumer, financial, and regulatory stakeholders together for short, problem-solving sessions on how technology can be used to develop solutions to specified challenges. For example, CFPB held tech sprints in 2021

[57]Policy sprints are events where agency staff with various backgrounds and relevant subject matter expertise conduct preliminary analysis and joint findings on various issues over a short period of time. Crypto assets are assets that are issued or transferred using distributed ledger technology such as blockchain, and can include but are not limited to virtual currencies, coins, and tokens.

[58]This section focuses on the three regulators—CFPB, NCUA, and OCC—with offices dedicated to addressing innovation in the financial industry. For industry participants' views on regulator outreach, see app. IV.

[59]OCC held four sessions in 2022, and CFPB held joint office hours with OCC in 2020. NCUA plans to hold office hours in 2024, according to officials.

related to Home Mortgage Disclosure Act requirements and rental assistance.[60]

Some agencies have engaged with industry participants in ways that are unique to their innovation offices. OCC's office has provided technical assistance to regulated entities, and has assisted OCC's Chief Counsel's Office with interpretive letters to industry participants, according to officials.[61] CFPB's office administers a Disclosure Sandbox designed to facilitate innovation in financial products and services by allowing companies to test alternative ways of providing required disclosures.[62]

However, OCC and CFPB's innovation offices have paused or stopped some outreach activities. According to officials, OCC paused OCC-initiated outreach events and has no plans to deploy an innovation pilot program it developed.[63] Additionally, according to officials, CFPB has not formally held office hours since December 2020 under the prior Office of Innovation.

Further, CFPB formally rescinded two of its innovation-related policies. In September 2022, CFPB rescinded its Compliance Assistance Sandbox policy which was intended to facilitate innovation in conditions of

[60]Home Mortgage Disclosure Act of 1975, Pub. L. No. 94-200, tit. III (codified as amended at 12 U.S.C. §§ 2801-2810). The tech sprint that focused on Home Mortgage Disclosure Act requirements involved data submission processes and tools to enhance analytics or publication of data. The Home Mortgage Disclosure Act and related federal regulations require covered financial institutions to collect, report, and publicly disclose loan-level information about mortgage loan applications and originations, among other things.

[61]Interpretive letters are letters from OCC's Chief Counsel that provide interpretations of existing laws and regulations. According to officials, OCC's Office of Innovation collaborated with OCC's Chief Counsel on letters focused on financial technology topics, such as a November 2021 interpretive letter regarding authority of OCC-regulated banks to engage in cryptocurrency activities.

[62]*See* Policy to Encourage Trial Disclosure Programs, 84 Fed. Reg. 48,260 (Sept. 13, 2019).

[63]The Innovation Pilot Program proposal was intended to provide a consistent and transparent framework for eligible entities to engage with OCC on small-scale and short-term tests to determine feasibility or consider how large-scale activity might work in practice. OCC publicly released a whitepaper, FAQs, and solicited public comments on the proposed program in April 2019. According to officials, while OCC received good comments on the proposed program, it recognized that the industry was going through an accelerated use of technology and decided to pause to ensure resources were aligned with OCC's overall mission of safety and soundness. The officials said OCC did not formally terminate the proposal but has no current plans to implement or adjust the program.

regulatory uncertainty while enabling better compliance with federal consumer financial laws.[64] According to the Federal Register Notice rescinding the policy, CFPB determined that the policy did not advance the stated objective of facilitating consumer-beneficial innovation, and failed to meet appropriate standards for transparency and stakeholder participation.[65] CFPB officials were not aware of any formal evaluation or analysis to determine whether the policy was effective in meeting its intended purpose.

Additionally, CFPB rescinded its No-Action Letter policy, which was also intended to facilitate innovation and enhance compliance with federal consumer financial laws.[66] CFPB rescinded this policy in the same Federal Register notice that rescinded the Compliance Assistance Sandbox policy, and for the same reasons. Officials said they were not aware of any formal evaluation or analysis to determine whether the policy was effective.

Innovation Offices Do Not Have Performance Goals or Measures for Key Parts of their Missions

All three innovation offices have identified addressing innovation in the industry as part of their missions, but they currently lack measurable performance goals or measures that are clearly targeted to key aspects of those missions.[67]

[64]CFPB's Compliance Assistance Sandbox policy offered regulated entities help in understanding how federal consumer financial law applies to specific aspects of particular products and services. It also offered a safe harbor from liability for those aspects approved under the policy. Policy on the Compliance Assistance Sandbox, 84 Fed. Reg. 48,246, 48,247, 48,256 (Sept. 13, 2019).

[65]Statement on Competition and Innovation, 87 Fed. Reg. 58,439 (Sept. 27, 2022). Officials further explained that CFPB had concerns about the program creating winners and losers or lacking a level playing field if one entity obtained approval while others did not. The officials also noted that CFPB found that some industry participants had made public statements overstating or overselling the approval they received from CFPB.

[66]CFPB's no-action letters would advise a regulated entity that, subject to certain limitations, CFPB would not initiate enforcement or supervisory action against the entity for a specified aspect of the product or service. Policy on No-Action Letters, 84 Fed. Reg. 48,229, 48,244 (Sept. 13, 2019).

[67]For the purposes of this section, a performance goal is a target level of performance expressed as a tangible, measurable objective against which actual achievement can be compared. A performance measure is the information used to monitor and report on progress toward those goals. The agencies use various terms for these goals and measures, such as a performance objective or performance indicator. For additional information on the performance goals and measures for these innovation offices, see app. III.

We have previously reported on leading practices for performance management.[68] These leading practices are based on requirements of the Government Performance and Results Act of 1993, as updated and expanded by the GPRA Modernization Act of 2010, and are relevant to any organizational level, such as offices of innovation. These leading practices state that performance goals and measures should cover key aspects of programs and activities, and be clear, targeted, and measurable.

CFPB's Office of Competition and Innovation

The Office of Competition and Innovation's mission is in part to promote competition and innovation that benefits consumers in the financial products and services market. Officials said the office's goals are still in flux given the office's recent reorganization. But the prior office's performance goals and measures related to industry outreach have carried over to the new Office of Competition and Innovation, according to officials. The office also had performance goals related to CFPB's sandbox and no-action letter policies, as well as measures that tracked how many applications were received, processed, and granted. Given the recent changes to the office's focus and activities, officials said they are in the process of developing new performance goals and measures.

CFPB officials also told us that its Office of Competition and Innovation contributes to some of the performance goals of the Division of Research, Monitoring, and Regulations—within which the Office of Competition and Innovation now resides. For example, the Office of Competition and Innovation tracks its external engagement focused on competition and emerging trends, which feeds into the division's performance goal related to monthly external engagements.

However, those goals and measures are not clearly targeted at the key activities or aspects of the office's mission, such as external engagements focused on innovation or internal support to other CFPB

[68]See, for example, GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118 (Washington, D.C.: June 1996), GAO, *The Results Act: An Evaluator's Guide to Assessing Agency Performance Plans*, GAO/GGD-10-1.20 (Washington, D.C.: Apr. 1998), GAO, *Defense Logistics: Improved Performance Measures and Information Needed for Assessing Asset Visibility Initiatives*, GAO-17-183 (Washington, D.C.: Mar. 2017), GAO, *Coast Guard: Additional Actions Needed to Improve Commercial Fishing Vessel Safety Efforts*, GAO-23-105289 (Washington, D.C.: Nov. 2022), and GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 2023).

offices or divisions. Specifically, while two performance measures track rulemaking results, they do not track internal collaboration efforts at the level in which the Office of Competition and Innovation is involved.[69] They are also not specific to promoting innovation. Additionally, while one performance measure tracks external engagement, it does so related to trends and risks focused on consumers as identified in another performance goal and does not mention innovation in financial products and services.[70] Similarly, while one performance goal mentions competition and innovation, none of the performance measures associated with that goal involve promoting innovation such as tracking external engagements with industry participants.[71]

OCC's Office of Financial Technology

OCC is in the process of preparing a mission and vision statement for the Office of Financial Technology, and the office is developing plans to continue tracking outreach efforts, as was done for its Office of Innovation, according to officials. Officials said the Office of Financial Technology does not have goals or measures specific to the office, but is informed by and contributes to OCC-wide performance goals and measures. Officials said the Office of Innovation did not have tracking expectations or performance goals before it was incorporated into the Office of Financial Technology.

We reviewed OCC's fiscal year 2022 and 2023 annual performance plan and reports and found that they do not include performance goals or measures related to innovation or outreach to industry participants.[72] We also reviewed OCC's strategic plan for fiscal years 2023–2027. It includes strategic goals that reference innovation and outreach to stakeholders, but it does not clearly lay out the activities needed to accomplish the goals, specify which offices in OCC address the goals, or include performance measures.

[69]See CFPB performance measures 1.1.1 and 1.1.2 in table 5 of app. III.

[70]See CFPB performance goal 3.1 and performance measure 3.1.2 in table 5 of app. III.

[71]See CFPB performance goal 3.2 in table 5 of app. III.

[72]OCC's 2022 annual performance plan and report described the activities carried out by the Office of Innovation, such as office hours, but the activities were not tied to any performance goal or measure.

Officials said they plan to develop tracking expectations for the Office of Financial Technology, but have not yet done so because the office is new and the mission and vision statements must be developed first.

NCUA's Office of Financial Technology and ACCESS

The mission of NCUA's office includes promoting the development and deployment of technologies and innovations that can expand financial inclusion and equitable and affordable consumer access within the credit union system. The office is currently operating under several performance goals and measures from NCUA's fiscal year 2023 Annual Performance Plan that are relevant to the office, according to an NCUA official.

The official noted that some of these goals and measures are related to policymaking, but none to the industry outreach activities the office says it plans to conduct. An official said goals and measures on industry outreach are likely to be included in next year's plan.

By developing performance goals and measures that are targeted to their innovation offices' specific missions and key activities, CFPB, OCC, and NCUA could better assess the effectiveness of their initiatives and the extent to which they are accomplishing their missions.

Regulators Use Supervisory Technology, but Some Do Not Have Performance Measures for Related Strategic Objectives

Supervisory technology generally refers to innovative tools or techniques that regulatory agencies use to improve their supervisory capabilities, according to literature we reviewed.[73] All five regulators said they use a variety of supervisory technologies, about half of which were implemented in the past 10 years. All regulators had at least one strategic objective focused on improving supervision with technology. The regulators have addressed some components of sound planning, such as identifying roles and responsibilities related to supervisory technology, but some have not developed performance measures for their objectives related to improving supervision with technology.

[73]See, for example, Hilary J. Allen, "Experimental Strategies for Regulating Fintech," *Journal of Law & Innovation (JLI)* 3 (2020): 1-35; Simone di Castri et al., *State of SupTech Report 2022*, (Cambridge: Cambridge Centre for Alternative Finance, University of Cambridge: 2022), accessed March 7, 2023, https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/state-of-suptech-report-2022/; Financial Stability Board, *The Use of Supervisory and Regulatory Technology by Authorities and Regulated Institutions: Market Developments and Financial Stability Implications* (Basel, Switzerland: Oct. 9, 2020).

Regulators Reported Using a Variety of Supervisory Technologies, About Half of Which Were Implemented in the Past 10 Years

All five agencies said they use a variety of supervisory technologies to support their supervision activities (see fig. 4).[74]

Figure 4: Supervisory Technologies That Regulators Reported Using

Type of supervisory technology[a]	Number of supervisory technologies used by regulator: CFPB	FDIC	Federal Reserve	NCUA	OCC
Data collection: Includes digital or online document management and advanced collection techniques (such as tools that automate the process of gathering data from websites)	2	4	5	0	1
Data processing: Includes task automation and advanced processing (such as machine learning or natural language processing)	1	7	1	1	0
Data storage: Includes big data tools and digitized recordkeeping (such as cloud or hybrid computing systems that store files digitally and can be accessed through the internet)	2	10	14	0	2
Data analytics: Includes descriptive or diagnostic analytics and predictive analytics (such as statistical tools that estimate the likelihood of risk)	1	7	4	2	3
Data products: Includes reporting tools that generate charts, metrics, or dashboards	0	7	7	0	6
Workflow tools: Includes communication platforms and scheduling systems	0	5	4	0	2
Other technologies: Includes all other supervisory tools identified by regulators	0	1	11	0	2
Total supervisory technologies reported	6	41	46	3	16

No supervisory technologies reported
1–5 reported
6–10 reported
More than 10 reported

CFPB: Consumer Financial Protection Bureau
FDIC: Federal Deposit Insurance Corporation
Federal Reserve: Board of Governors of the Federal Reserve System
NCUA: National Credit Union Administration
OCC: Office of the Comptroller of the Currency

Source: GAO analysis of agency information. | GAO-23-106168

Note: We asked the agencies we reviewed to identify the supervisory technology they used. The agencies provided lists of their supervisory technology from May through August 2023. We did not evaluate the effectiveness or potential limitations of these technologies.

[a]These categories of supervisory technology are based on a taxonomy from the Cambridge SupTech Lab. Simone di Castri et al., *State of SupTech Report 2022*, (Cambridge: Cambridge Centre for Alternative Finance, University of Cambridge: 2022), accessed March 7, 2023, https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/state-of-suptech-report-2022/.

[74]We asked the agencies we reviewed to identify the supervisory technology they used. We did not evaluate the effectiveness or potential limitations of these technologies.

The regulators told us they use supervisory technologies in several ways.[75] Some examples include the following:

- **Data collection.** Four regulators said they use technology to collect data from sources such as financial institutions, supervised entities, or consumers. For example, officials said CFPB and FDIC have platforms to securely share digital files.
- **Data processing.** Four regulators use technology to enhance the validation, consolidation, or cleaning of data, according to agency officials. For example, FDIC officials said the agency automates the creation of certain reports that are used in fair lending reviews or Community Reinvestment Act performance evaluations.[76] In addition, officials from two agencies said they use advanced data processing tools that use machine learning or natural language processing. For example, NCUA officials said their agency uses machine learning to identify errors in call reports.[77]
- **Data storage.** Four regulators told us they use supervisory technology to securely store data, such as information from examinations. Additionally, CFPB, FDIC, and the Federal Reserve are in the process of modernizing their digital repositories that organize examination data and documents, according to the agencies.[78]
- **Data analytics.** All regulators use technologies for data analysis, according to officials. For example, OCC officials said the agency has

[75]We categorized the supervisory technology that agencies said they use with a taxonomy from the Cambridge SupTech Lab. One method the Cambridge SupTech Lab uses for categorizing supervisory technology is by the technology and data science that are used. Castri et al., *State of SupTech Report 2022*, 14-17.

[76]Under the Community Reinvestment Act of 1977, federal banking agencies assess the extent to which banking institutions meet the credit needs of the communities in which they operate, consistent with safe and sound operations. Pub. L. No. 95-128, tit. VIII, 91 Stat. 1147 (codified as amended at 12 U.S.C. §§ 2901-2908).

[77]Call reports are quarterly financial reports prepared by insured depository institutions (such as banks and credit unions) for federal banking regulators.

[78]CFPB officials said CFPB plans to launch a redesigned and rebuilt supervision examination system in summer 2023. According to CFPB, this new system will automate certain data entry and be integrated with other CFPB data systems. FDIC officials said FDIC is in the middle of a multi-stage implementation of a new examination system. According to FDIC, this new system is cloud-based, supports examination workflow, centralizes information, and replaces a 25-year-old system FDIC had previously been using. Federal Reserve officials said the Federal Reserve is developing new supervision systems that will be cloud-based, consolidate multiple data sources, and improve users' experience accessing and analyzing supervision data.

an examination tool to test compliance with certain legal requirements. Additionally, FDIC officials said the agency uses machine learning techniques in off-site supervisory monitoring to help identify risk.

The supervisory technologies used by the regulators were implemented at different times (see table 3). Some of these technologies were introduced in phases over multiple years, and some technologies have been updated since their initial implementation, according to officials from some agencies.

Table 3: Supervisory Technology Regulators Indicated Using, by Year Implemented

Year implemented	Consumer Financial Protection Bureau	Federal Deposit Insurance Corporation	Board of Governors of the Federal Reserve System	National Credit Union Administration	Office of the Comptroller of the Currency
1993-2002	0	3	7	0	4
2003-2012	1	6	13	0	7
2013-2023	3	29	26	1	5
Year not specified	2	3	0	2	0
Total supervisory technologies regulators indicated using	**6**	**41**	**46**	**3**	**16**

Source: GAO analysis of agency information. I GAO-23-106168

Note: We asked the agencies we reviewed to identify the supervisory technology they used. The agencies provided lists of their supervisory technology from May through August 2023. We did not evaluate the effectiveness or potential limitations of these technologies.

Some agency officials said there were both benefits and challenges to using supervisory technology. All five regulators said supervisory technology supported or improved data analysis or understanding, four regulators said the technology helped them identify areas of risk, and three regulators said supervisory technology increased efficiency and helped examiners complete tasks quickly. For example, FDIC officials said certain tools improved efficiency by automating or centralizing certain processes, such as scheduling exams, collecting data and documents from banks electronically, and populating digital examination forms and reports. Three regulators told us they faced some challenges when implementing supervisory technology, such as the cost of contractor support.[79]

Agencies Have Identified Supervisory Technology as a Strategic Objective, but Some Have Not Developed Performance Measures

Components of sound planning are important because they help define what organizations seek to accomplish, identify specific activities to obtain desired results, and provide tools to help ensure accountability and mitigate risks.[80] Although there is no established set of requirements for all plans, our prior work identified components of sound planning to include (1) setting objectives, activities, and performance measures and (2) identifying roles and responsibilities.[81]

All of the agencies have established at least one strategic objective for using technology to improve supervision. In addition, they all identified the roles of specific staff, offices, or divisions involved in supervisory technology, and their responsibilities related to supervisory technology.

[79]For example, FDIC officials told us FDIC has a process that reviews images of loan files in a standardized format to increase the efficiency of electronic review. However, the officials said some regulated institutions do not image their loan files, and third party service providers may charge institutions to send the images to FDIC. The officials said FDIC is exploring ways to incentivize institutions to image their loan files, and also is considering ways for its staff to view the loan files at the institution, without requiring their delivery to the regulator.

[80]In previous work, we identified components of sound planning by developing six components that are desirable characteristics of national strategies. We developed the components based on analysis of key legislation, legislative and executive branch guidance, and literature on strategic planning and performance, among other sources. See GAO, *Combating Terrorism: Evaluation of Selected Characteristics in National Strategies Related to Terrorism*, GAO-04-408T (Washington, D.C.: Feb. 3, 2004).

[81]Our prior work identified six components of sound planning. We selected two components to review because of their relevance to our analysis. Prior GAO work has included goals in one of these selected components. We determined agencies' strategic goals were not relevant to this analysis because strategic goals for supervision are generally broad. We determined there was limited value in assessing whether agencies addressed the other four components for supervisory technology. For example, one other component is integration and implementation, which includes addressing how a plan relates to other strategies' goals, objectives and activities, and implementation plans. Supervisory technology is, by definition, related to agencies' supervisory capabilities, and is therefore related to agency goals, objectives, and activities addressing supervision. Therefore, we determined that assessing the agencies' integration of supervisory technology with other goals, objectives, or activities was not relevant to our analysis. For more detail, see app. I.

However four agencies have not developed performance measures for their supervisory technology strategic objectives (see table 4).[82]

Table 4: Extent to Which Regulators Addressed Two Selected Components of Sound Planning Related to Supervisory Technology, as of May 2023

Component of sound planning	Consumer Financial Protection Bureau	Federal Deposit Insurance Corporation	Board of Governors of the Federal Reserve System	National Credit Union Administration	Office of the Comptroller of the Currency
Roles, responsibilities, and other coordination *Elements of this component include roles and responsibilities of specific departments or offices; lead, support, and partner roles and responsibilities; and specific processes for coordination and collaboration*	●	●	●	●	●
Objectives, activities, and performance measures[a] *Elements of this component include overall results desired (i.e., "end-state"); specific activities to achieve results; and specific performance measures.*	◐	●	◐	◐	◐

Legend:
● Generally addressed – Agency's actions followed all or most aspects of the component
◐ Partially addressed – Agency's actions followed some, but not most aspects of the component
○ Did not address – Agency's actions did not follow any aspects of the component

Source: GAO analysis of agency information. I GAO-23-106168

[a]Prior GAO work has included goals in this component. We determined agencies' strategic goals were not relevant to this analysis because strategic goals for supervision are generally broad.

Roles, responsibilities, and other coordination. All five regulators generally addressed this component of sound planning. They identified specific divisions, offices, or roles that are responsible for supervisory technology. In particular, CFPB, officials from the Federal Reserve, and officials from NCUA identified specific offices or roles that are responsible for supervisory technology. For example, CFPB's fiscal year 2023 annual performance plan states that the Supervision, Enforcement, and Fair

[82]We present illustrative examples of the agencies' actions related to selected components of sound planning for purposes of this report.

Lending Division is the primary leader for two objectives related to developing and enhancing supervision tools. The plan identifies the division's associate director as responsible for the agency's efforts to research new supervisory technology.

FDIC and OCC officials said both their individual supervision offices and general information technology offices explore or develop supervisory technology. For example, OCC officials said OCC's Information Technology Services and lines of business are evaluating new supervisory technology tools. Additionally, FDIC, the Federal Reserve, and OCC have policies or processes for developing new technology, which include specific roles, defined responsibilities, and established guidelines for coordination.

Objectives, activities, and performance measures.[83] One regulator generally addressed and four regulators partially addressed this component of sound planning. All had at least one strategic objective focused on improving supervision with technology. The regulators also identified specific activities to achieve those results. However, only one of the regulators, FDIC, had performance measures specific to their objectives about supervisory technology.

- **CFPB.** CFPB's fiscal year 2022–2026 strategic plan states that the agency plans to promote development of and enhance its use of supervisory technology and tools.[84] Its fiscal year 2023 annual performance plan also describes planned increases in supervisory technology and identifies artificial intelligence as a potential tool for supervision activities.[85] However, CFPB has not developed

[83]This component involves addressing what the plan is trying to achieve (objectives), how it will achieve those results (activities), and a method used to monitor and gauge results (performance measures). Our prior work stated that specific and outcome-related performance measures are key elements of sound planning practices.

[84]CFPB's 2022–2026 strategic plan states a specific activity for two of its objectives related to supervision and enforcement is to promote development and enhancement of tools, processes, and methods to identify potential violations and to ensure compliance with Federal consumer financial laws.

[85]CFPB's 2023 annual performance plan also states that CFPB is continuing to assess sources and capabilities that will provide an enhanced data-driven approach to its areas of supervisory focus. It notes that leveraging additional data sources and artificial intelligence within the supervisory prioritization process may allow CFPB to identify risk signals more efficiently and effectively. The plan also states that CFPB is researching new supervisory technology tools to ensure it focuses its supervisory resources as effectively as possible.

performance measures to gauge its progress toward the strategic objectives or activities related to supervisory technology.[86] CFPB officials told us the agency has not developed measures because it is still evaluating its use of supervisory technology.

- **FDIC.** The agency's 2020–2024 IT Modernization Plan has an objective to modernize supervision, which includes using supervisory technology.[87] For example, the plan states FDIC intends to equip and train examiners to use new tools like artificial intelligence and machine learning.[88] Additionally, agency officials said FDIC has identified performance goals for this objective and some performance measures to gauge progress toward those goals. Officials said FDIC develops performance measures for its IT Modernization Plan, including milestones for supervisory technology initiatives, on an annual basis.
- **Federal Reserve.** The Federal Reserve's 2020–2023 strategic plan has an objective to broaden supervision through investments in people, technology, and data. The 2020–2023 strategic plan, 2023 annual performance plan, and 2019 Supervision IT Strategic Direction describe specific activities the Federal Reserve will complete to achieve this objective, such as investigating or advancing supervisory tools.[89]

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[86]CFPB's 2023 annual performance plan contains performance measures for its objectives, but the measures are not related to supervisory technology. For example, one performance measure is the number of fair lending supervision events opened during the fiscal year. Another measure is the average duration, in months, to file or settle investigations.

[87]Specifically, the plan states that to, "optimally support examiners and minimize regulatory burden on financial institutions will require technologies and capabilities that facilitate remote examination, collaboration with internal FDIC and external stakeholders (banks and other federal and state regulators), decreased reliance on and production of paper documents, and predictive analytical tools that support mining large volumes of examination data."

[88]FDIC's plan describes key actions for supervision modernization, including automating processes related to compliance and risk examinations, reducing manual processing and overhead, improving analytics and access to data, and improving off-site exam review tools and connectivity.

[89]For example, the strategic plan states that to achieve its objective, the agency will continue to implement the supervision information technology strategic plan, investigate the use of technologies to execute supervisory activities more efficiently and to improve risk identification, and expand use of data to further supervisory objectives. The Supervision IT Strategic Direction states the agency will leverage new or emerging technology and actively seek, assess, and determine if new technology is a good fit to meet business needs.

The agency regularly evaluates the technology its supervision offices use, but these evaluations do not assess the Federal Reserve's progress toward its strategic objective related to supervisory technology. Officials told us the Federal Reserve has not yet developed performance measures because it is developing a new process for reviewing and assessing supervisory technology initiatives, and has been focused on metrics related to staff engagement and awareness about supervisory technology tools.

- **NCUA.** The agency's 2022–2026 strategic plan and 2023 annual performance plan include an objective to enhance data analysis and implementation of innovative technologies.[90] The strategic plan describes specific activities for achieving this objective, such as modernizing systems for examinations and improving analytics to better predict risks. However, NCUA has not developed performance measures for the objectives specific to supervisory technology.[91] NCUA officials told us the agency hired a Director of Financial Technology and Access in January 2023, and that role will develop performance measures once the NCUA board approves the 2024 performance plan.
- **OCC.** The agency's 2023–2027 strategic plan states the agency has two objectives related to supervisory technology, which are to enhance risk-based supervision and invest in innovation. The plan also includes specific activities OCC plans to complete to achieve these objectives, including investing in researching and developing innovative supervision approaches. Additionally, OCC's Statement of IT Services Strategy has objectives and specific activities to modernize the agency's supervision systems. OCC has performance measures for its technology projects, including measures for project scope and cost. However, the agency has not developed performance measures that are specific to the strategic objectives or activities related to supervisory technology. Agency officials told us OCC might

[90]Specifically, the strategic plan states that one of the agency's strategic objectives is to "[d]eliver improved business processes supported by secure, innovative, and reliable technology solutions and data." In further describing this objective, the plan states the agency "plans for new and improved approaches to harness emerging data, advance its analytical techniques, deploy innovative technology, and implement improvements in its supervisory approach."

[91]NCUA has developed performance measures for implementing technology in general, but they are not specific to supervisory technology objectives. For example, one of the measures is to offer training sessions for NCUA's self-service business intelligence tool, and another is to report certain computer security incidents within 1 hour of identification.

develop measures aligned with OCC's strategic plan, but provided no details or time frames for this potential project.[92]

The regulators we reviewed have identified the enhancement of supervisory technology as a strategic objective. Agency officials from three regulators also said they were in the process of exploring the potential of implementing new supervisory technology that uses machine learning, artificial intelligence, or natural language processing. However, most of the agencies do not have performance measures specifically related to their strategic supervisory technology initiatives. For example, they do not have measures for such things as tracking the number of examinations improved by such technologies, or the time or cost savings as a result of the adoption of supervisory technologies. By developing performance measures specific to their strategic objectives related to supervisory technologies, the regulators could better monitor their progress toward enhancing their supervision through the use of supervisory technology.

Conclusions

Financial institutions are increasingly using financial technology, making it crucial for staff of the prudential regulators and CFPB to have the needed technological skills and expertise for policymaking and oversight in this area. The agencies have taken steps to enhance staff skills and expertise by developing positions, programs, and training related to financial technology. However, they have opportunities to improve their workforce planning processes in this area by fully incorporating leading practices. By identifying the critical technological skills related to financial technology that staff need, developing targeted strategies to address skill gaps, and measuring the effectiveness of their financial technology training, the agencies could help ensure their current and future workforces have the skills and expertise needed to effectively develop policy and conduct oversight related to financial technology.

Opportunities also exist for the agencies to improve how they measure the performance of their innovation offices and use of supervisory technology. Developing performance goals and measures that are clearly targeted to the innovation offices would help the agencies assess the extent to which the offices are accomplishing their missions and determine which initiatives are best suited toward addressing innovation.

[92]OCC has developed performance measures for technology in general, but those measures do not specifically address the agency's supervisory technology strategic objectives. For example, some of its performance measures include the scope and cost of individual technology projects, the number of unscheduled IT outages, and the percentage of cloud platforms or applications across the entire agency.

In addition, developing performance measures for the use of supervisory technology would better position the agencies to monitor progress toward their objectives of enhancing their supervisory capabilities through the use of that technology.

Recommendations for Executive Action

We are making a total of 12 recommendations, including three to CFPB, NCUA, and OCC, two to the Federal Reserve, and one to FDIC. Specifically:

The Director of the Consumer Financial Protection Bureau should fully incorporate leading workforce planning practices in the primary offices involved in policymaking and oversight related to financial technology by conducting strategic workforce planning that addresses financial technology; collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology-related training in addressing skill needs. (Recommendation 1)

The Director of the Consumer Financial Protection Bureau should develop performance goals and measures for CFPB's Office of Competition and Innovation that cover key aspects of the office's activities, such as outreach to industry participants, and that are clear, targeted, and measureable. (Recommendation 2)

The Director of the Consumer Financial Protection Bureau should develop performance measures that are specific to its strategic objectives related to supervisory technologies. (Recommendation 3)

The Chair of the Federal Deposit Insurance Corporation should fully incorporate leading workforce planning practices for the primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology-related training in addressing skill needs. (Recommendation 4)

The Chair of the Board of Governors of the Federal Reserve System should fully incorporate leading workforce planning practices in the primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology training in addressing skill needs. (Recommendation 5)

The Chair of the Board of Governors of the Federal Reserve System should develop performance measures that are specific to its strategic objectives related to supervisory technologies. (Recommendation 6)

The Chair of the National Credit Union Administration should fully incorporate leading workforce planning practices in the primary offices involved in policymaking and oversight related to financial technology by conducting strategic workforce planning that addresses financial technology; collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness its financial technology training in addressing skill needs. (Recommendation 7)

The Chair of the National Credit Union Administration should develop performance goals and measures for NCUA's Office of Financial Technology and ACCESS that cover key aspects of the office's activities, such as outreach to industry participants, and that are clear, targeted, and measureable. (Recommendation 8)

The Chair of the National Credit Union Administration should develop performance measures that are specific to its strategic objectives related to supervisory technologies. (Recommendation 9)

The Comptroller of the Currency should fully incorporate leading workforce planning practices in OCC's primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology-related training in addressing skill needs. (Recommendation 10)

The Comptroller of the Currency should develop performance goals and measures for OCC's Office of Financial Technology that cover key aspects of the office's activities, such as outreach to industry participants, and that are clear, targeted, and measureable. (Recommendation 11)

The Comptroller of the Currency should develop performance measures that are specific to OCC's strategic objectives related to supervisory technologies. (Recommendation 12)

Agency Comments

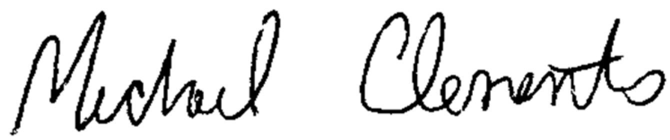
We provided a draft of this report to CFPB, FDIC, the Federal Reserve, NCUA, and OCC for review and comment. All of the agencies provided written comments, which are reproduced in appendixes VI through X. In addition, FDIC, the Federal Reserve, and OCC provided technical comments, which we incorporated as appropriate.

NCUA agreed with our recommendations and described the actions it will take in response to them. CFPB, FDIC, the Federal Reserve, and OCC neither agreed nor disagreed with our recommendations, but each indicated they would take actions to implement them. CFPB stated it appreciated the recommendations and it looks forward to continuing to work with us as we monitor its progress implementing the recommendations. FDIC stated it will consider additional workforce planning practices identified in the recommendation as part of its ongoing efforts to ensure staff involved in policymaking and oversight have appropriate skillsets related to financial technology. The Federal Reserve stated it will evaluate potential enhancements to its processes and expectations to best address our first recommendation (recommendation 5), including collecting skill data and developing strategies to address any skill gaps related to financial technology. In response to our second recommendation to the Federal Reserve (recommendation 6), the Federal Reserve stated it is committed to developing performance measures that address the agency's strategic objectives related to supervisory technologies. OCC stated the agency will develop planned actions for addressing each of our recommendations by the third quarter of 2024.

As agreed with your office, unless you publicly announce the contents of the report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Director of the Consumer Financial Protection Bureau, the Chair of the Federal Deposit Insurance Corporation, the Chair of the Board of Governors of the Federal Reserve System, the Chair of the National Credit Union Administration, the Acting Comptroller of the Currency, and other interested parties. In addition, the report will be available at no charge on the GAO website at https://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-8678 or clementsm@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 XI.

Sincerely yours,



Michael E. Clements
Director, Financial Markets and Community Investment

Appendix I: Objectives, Scope, and Methodology

We reviewed the prudential regulators'—the Federal Deposit Insurance Corporation (FDIC), Board of Governors of the Federal Reserve System (Federal Reserve), National Credit Union Administration (NCUA), and Office of the Comptroller of the Currency (OCC)—and the Consumer Financial Protection Bureau's (CFPB) technological expertise related to financial technology, among other issues. We defined financial technology as the use of technology and innovation to provide financial products and services.

This report examined (1) the technological skills or expertise related to financial technology policymaking and oversight that regulators' staff possess; (2) regulators' workforce planning processes to ensure their staff are sufficiently knowledgeable to engage in policymaking and oversight related to financial technology products and services and the extent to which those processes are consistent with leading practices; (3) how regulators address innovation in financial technology and measure the results of those efforts; and (4) how regulators use technology to improve their supervisory capabilities.[1]

For the first objective, because the prudential regulators and CFPB do not collect data on staff technological skills, we reviewed position descriptions and job vacancy announcements for positions the agencies identified as being related to financial technology policymaking and oversight. We then determined if these positions required any technological skills. We reviewed a total of 181 position descriptions and 30 job vacancy announcements from the agencies.

In addition, we interviewed agency officials and held between two and four focus groups per agency with a nongeneralizeable sample of employees from the primary offices involved in policymaking and oversight as identified by the agencies. In total, we held 16 focus groups consisting of a total of 90 staff across the five agencies to learn more about their technological skillsets and expertise related to financial technology. Employees were selected to reflect a judgmental mix of position type (policymaking staff, examiners, and enforcement staff), managerial status, tenure, agency subdivision or examination group, geographic location, subject matter expertise, and participation in task

[1]For purposes of this report, policymaking refers to the development of rules, regulations, policies, and guidance. Oversight refers to the supervision of regulated institutions, including activities such as monitoring and examining and taking enforcement actions. Supervisory technology generally refers to innovative tools or techniques that regulatory agencies use to improve their supervisory capabilities.

forces or initiatives related to financial technology. We gathered staff views on their experience and skillsets related to financial technology, as well as on agency staffing and training for policymaking and oversight positions. Information and views obtained from the focus groups cannot be generalized to all staff within the agencies.

Additionally, we conducted a literature review and interviewed a sample of seven industry associations and four members of one of the associations (for a total of 11 industry participants). The industry associations were the American Bankers Association, Alliance for Innovative Regulation, Financial Technology Association, Independent Community Bankers of America, Money Services Business Association, National Association of Federally-Insured Credit Unions, and Electronic Transactions Association. We selected the associations to represent a range of regulated entities that offer different types of financial technology products and services, and based on recommendations from other interviewees, among other factors. Information and views obtained from the industry associations and members cannot be generalized to all industry participants.

For the second objective, we reviewed workforce planning documents for the agencies' primary offices responsible for policymaking and oversight related to financial technology. Examples include strategic human capital plans, workforce plans, and training policies. We also interviewed agency officials about their workforce planning processes. Additionally, in our focus groups, we obtained employee perspectives on the training they need and receive related to financial technology.

We then assessed the extent to which the agencies' workforce planning processes followed leading practices on workforce planning we identified in prior work, with a specific focus on how the processes addressed financial technology.[2] We made this assessment using three categories. "Generally followed" indicates that an agency's actions reflect all or most aspects of the leading practice; "partially followed" indicates that an

[2]GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: Dec. 11, 2003). The 2003 report identified key principles of strategic workforce planning. For purposes of this report, we refer to the principles as leading practices. To develop the key principles for the 2003 report, we reviewed our own guidance, reports, and testimonies on federal agencies' workforce planning and human capital management efforts, as well as leading human capital periodicals. We also met with officials from organizations with governmentwide responsibilities for or expertise in workforce planning.

agency's actions reflect some, but not most aspects of the leading practice; and "did not follow" indicates that an agency's actions did not follow any aspects of the leading practice.[3] One analyst reviewed agency workforce planning documents for these offices to make an initial assessment. A second analyst then reviewed the same information to make an additional assessment. The analysts then discussed their assessments to reconcile any differences and agreed upon final determinations.

For the third objective, we reviewed documentation of agencies' innovation offices and programs, when available. These included, for example, announcements and documents that established these offices, as well as websites or operational documents and reports that described how the agencies address innovation. Additionally for agencies with innovation offices, we reviewed the agencies' annual performance plans and mission statements for those offices, and related performance measures, where available, to identify how the agencies or offices set goals related to innovation and measured the results of those efforts.[4]

In addition, we interviewed agency officials about their innovation offices and outreach efforts to industry participants related to financial technology. We also interviewed representatives of industry associations and their members (described above) to gather their views on how regulators have addressed innovation and communicated with industry participants. We then assessed the extent to which the agencies evaluated their efforts to address innovation in financial technology,

[3]We presented illustrative examples of the agencies' actions related to each leading practice for the purposes of this report.

[4]FDIC and the Federal Reserve do not currently have dedicated innovation offices that conduct outreach to industry participants, but they do have offices that focus on technology.

including their use of performance goals and measures, based on practices identified in our prior work.[5]

For the fourth objective, we requested that each of the agencies identify the technologies they use to help improve their supervisory capabilities. We then categorized these supervisory technologies using a taxonomy developed by the Cambridge SupTech Lab, which is a part of the University of Cambridge Judge Business School.[6] This taxonomy categorizes supervisory technology by the type of technologies and data science tools used and applications of the technologies. GAO added two categories to the Cambridge SupTech Lab's taxonomy, for the purposes of our analysis: "workflow tools" and "other technologies." One analyst reviewed the supervisory technologies to make an initial categorization assessment. A second analyst then reviewed the same information to make an additional assessment. The analysts then discussed their assessments to reconcile any differences and agreed upon final determinations.

We then reviewed agencies' planning documentation for their supervisory technologies. These included their information technology modernization plans, strategic plans, or annual performance plans. We then assessed the extent to which the agencies' plans addressed selected components

[5]See, for example, GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118 (Washington, D.C.: June 1996), GAO, *The Results Act: An Evaluator's Guide to Assessing Annual Agency Performance Plans*, GAO/GGD-10-1.20 (Washington, D.C.: Apr. 1998), GAO, *Defense Logistics: Improved Performance Measures and Information Needed for Assessing Asset Visibility Initiatives,* GAO-17-183 (Washington, D.C.: Mar. 2017), GAO, *Coast Guard: Additional Actions Needed to Improve Commercial Fishing Vessel Safety Efforts*, GAO-23-105289 (Washington, D.C.: Nov. 2022), and GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, GAO-23-105460 (Washington, D.C.: July 2023).

[6]Simone di Castri et al., "State of SupTech Report 2022," (Cambridge: Cambridge Centre for Alternative Finance, University of Cambridge: 2022), accessed March 7, 2023, https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/state-of-suptech-report-2022/.

of sound planning practices, which we identified in prior GAO work.[7] We made this assessment using three categories: "generally addressed" indicates that an agency's actions reflect all or most aspects of the component; "partially addressed" indicates that an agency's actions reflect some, but not most, aspects of the component; and "did not address" indicates that an agency's actions did not follow any aspects of the component. One analyst reviewed planning documents to make an initial assessment. A second analyst then reviewed the same information to make an additional assessment. The analysts then discussed their assessments to reconcile any differences and agreed upon final determinations.

Finally, to develop a working definition of supervisory technology used by financial regulators, we conducted a literature review of relevant research that was published from 2014 to 2022. For example, we conducted a structured search of multiple electronic databases, including ProQuest, Scopus, EBSCOHost, and Dialog, among others. We limited our search to English language materials and those focused on the United States. The materials we reviewed included peer-reviewed articles, government publications, and private sector reports.

Our structured search identified 34 articles relevant to the supervisory technology objective. Analysts then reviewed the articles to identify those to include in our review that met the following criteria: (1) discussed supervisory technology, and (2) discussed the financial regulators included in this report. Of the 34 articles identified in the structured literature review, we identified 24 that were relevant to this objective.

[7]Our prior work identified sound planning practices by developing six components that are desirable characteristics of national strategies, based on analysis of key legislation, legislative and executive branch guidance, and literature on strategic planning and performance, among other sources. We selected two components to review because of their relevance to our analysis. For the purposes of this report, we determined there was limited value in assessing whether agencies addressed the other four components for supervisory technology. For example, one other component is integration and implementation, which includes addressing how a plan relates to other strategies' goals, objectives and activities, and implementation plans. Supervisory technology is, by definition, related to agencies' supervisory capabilities, and is therefore related to agency goals, objectives, and activities addressing supervision. Therefore, we determined that assessing the agencies' integration of supervisory technology with other goals, objectives, or activities was not relevant to our analysis. See GAO, *Combating Terrorism: Evaluation of Selected Characteristics in National Strategies Related to Terrorism*, GAO-04-408T (Washington, D.C.: Feb. 3, 2004).

We conducted this performance audit from July 2022 to September 2023 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.

Appendix II: Additional Information on Regulators' Use of Leading Workforce Planning Practices for Financial Technology Policymaking and Oversight Staff

As discussed in more detail below, the prudential regulators—Federal Deposit Insurance Corporation (FDIC), Board of Governors of the Federal Reserve System (Federal Reserve), National Credit Union Administration (NCUA), and Office of the Comptroller of the Currency (OCC)—and the Consumer Financial Protection Bureau (CFPB) have taken several steps to implement leading workforce planning practices to ensure their staff have the knowledge needed to conduct policymaking and oversight related to financial technology. However, they have not fully identified their financial technology skill needs or measured the effectiveness of their financial technology training.[1]

Consumer Financial Protection Bureau

CFPB has generally followed one leading workforce planning practice, partially followed three practices, and has not followed one practice.

- **Conduct strategic workforce planning.**[2] CFPB did not follow this practice. CFPB's 2020–2026 agencywide strategic plan includes a strategic goal and objective to improve its workforce, and the agency has developed an annual staffing process that involves employees.[3] However, these efforts do not expressly address financial technology.
- **Determine critical skills.**[4] CFPB partially followed this practice. CFPB has identified some skill and knowledge requirements related to financial technology in position descriptions. For example, CFPB's Senior Markets and Policy Fellows, which advise leadership and staff

[1]We present illustrative examples of the agencies' actions related to each leading practice for the purposes of this report.

[2]This practice includes ensuring that top management sets the overall direction and goals of workforce planning and involves employees and other stakeholders (such as agency managers and supervisors) in developing and implementing future workforce strategies.

[3]CFPB's strategic objective focuses on cultivating an engaged and informed workforce to maximize talent and development in alignment with CFPB's mission. According to its strategic plan, strategies to meet this objective include analyzing and maturing CFPB's learning and development opportunities to develop new skills required for a modern workforce, and reviewing and redesigning the skills CFPB wants in its employees. According to CFPB officials, CFPB's annual staffing process involves the agency's human resources staffing team partnering with each division within CFPB to develop staffing requests. This process may involve requesting positions designed to bring in specific skills and expertise.

[4]This practice involves agencies determining the skills and competencies that are critical to successfully achieving their missions and goals. The practice emphasizes that it is essential for agencies to determine the critical skills and competencies that will be needed to achieve both current and future programmatic results, particularly as changes occur in technology and other areas.

on strategic issues in certain markets or products, may be required to have expert knowledge of consumer financial technology.[5] However, CFPB has not collected data on the technological skills or expertise related to financial technology that its staff possess, according to officials, which would provide the agency with a baseline of its staff's skillsets and a starting point for determining skill needs. Also, CFPB has not conducted an assessment to determine the critical financial technology skills needed for its policymaking and oversight staff.

- **Design strategies to address skills gaps.**[6] CFPB partially followed this practice. CFPB has taken some actions to help staff better understand financial technology. For example, in February 2022, CFPB developed a Technologist program to embed staff with technical expertise in areas such as data science and artificial intelligence within CFPB's supervision and enforcement teams. According to officials, the mission of the program is to have program staff working alongside attorneys, economists, and others to supervise financial institutions using their technical expertise to inform investigations or litigated matters. CFPB officials also have provided staff with some training related to financial technology, such as training on cryptocurrency. However, CFPB has not fully identified its financial technology skill needs. Without first taking this step, CFPB cannot fully develop strategies that are specifically targeted to address any staff skill gaps related to financial technology.
- **Build capabilities to support workforce planning.**[7] CFPB generally followed this practice. CFPB officials told us that they used their existing hiring authority to develop the Technologist program and hire Markets and Policy Fellows, which are term positions. According to officials, term positions are designed to bring skills and expertise to

[5]CFPB officials described CFPB's process for identifying its skill needs as including conversations with current staff and those leaving the agency that have strong technical skills to help identify existing skill gaps. They added that to the extent CFPB identifies that industry participants are using a particular technology, CFPB will look to ensure it has the specific skills set needed to address the technology's use.

[6]Applying this leading practice to strategic workforce planning means that agencies (1) develop hiring, training, staff development, succession planning, and other human capital strategies and tools that can be implemented with the resources that can be reasonably expected to be available, and (2) consider how these strategies can be aligned to eliminate gaps and improve the contribution of critical skills and competencies.

[7]This practice includes making effective use of human capital flexibilities (which refers to the policies and practices that an agency has the authority to implement in managing its workforce, such as hiring authorities) and streamlining and improving administrative processes.

CFPB through fellowships or other term appointments to support time-bound initiatives. The officials added that technologist positions are subject to veterans preference, and noted this population has many relevant skills. CFPB officials also told us that they consistently look for new guidance from the Office of Personnel Management (OPM) on hiring authorities that will help the agency onboard new staff.[8] Additionally, CFPB's Research, Monitoring, and Regulations division has developed a tool to track vacancies and prioritize hiring.

- **Monitor and evaluate progress.**[9] CFPB partially followed this practice. As discussed earlier, CFPB developed its Technologist program and provided staff with some training to help staff better understand financial technology. CFPB has performance standards applicable to staff in the Technologist program. CFPB officials also told us the agency measures the success of the Technologist program through increased inclusion of advanced technology in exams and investigations and CFPB's ability to quickly understand and address emerging uses of technology. Additionally, CFPB officials said the agency obtains feedback on its financial technology training from participants. However, CFPB has not measured the effectiveness of its financial technology training in addressing its financial technology skill needs.

Federal Deposit Insurance Corporation

FDIC has generally followed two leading workforce planning practices, and has partially followed three others.

- **Conduct strategic workforce planning.** FDIC generally followed this practice. FDIC has engaged in strategic workforce planning related to financial technology as part of its enterprise risk management

[8]CFPB's recruitment process includes conducting outreach to specific groups, such as veterans who code, computer scientists, and Latino and Native American Groups, in addition to posting jobs on USAJobs.gov, according to officials. The officials added that CFPB's outreach efforts help when looking to hire positions that require substantial technology skills.

[9]This practice involves measuring the outcomes of human capital strategies and how these outcomes have helped organizations accomplish their missions and goals. For example, performance measures can be used to indicate whether the agency executed its hiring, training, or retention strategies as intended and achieved the goals for these strategies, and how these initiatives changed the workforce's skills and competencies.

program.[10] For example, FDIC's Division of Depositor and Consumer Protection identified a risk related to emerging financial technology and digital activities. Agency documentation on the risk stated that if the division does not stay abreast of technological advances, third party relationships, and financial technology products and services used in the financial industry, it will not be equipped to effectively supervise financial institutions and may miss opportunities to encourage the use of these technologies to promote inclusion in the insured banking system. FDIC developed mitigation strategies to address this risk, including regular communications on emerging technology to supervision staff supporting continuous learning and development, and an initiative to coordinate communication, resources, and knowledge sharing throughout the division. Additionally, FDIC's Risk Management Supervision division developed a workforce plan to document its strategic workforce planning practices, which included a discussion about examiner training related to financial technology.[11]

- **Determine critical skills.** FDIC partially followed this practice. FDIC has identified some skill requirements related to financial technology in its position descriptions, such as knowledge of blockchain, machine learning, and artificial intelligence for a technology specialist position.[12] Additionally, FDIC's Division of Depositor and Consumer

[10]According to FDIC's 2021 annual report, FDIC's agencywide risk management program has made an effort to identify and assess financial, reputational, and operational risks and incorporate corresponding controls into day-to-day operations. The program requires that divisions and offices document comprehensive procedures, thoroughly train employees, and hold supervisors accountable for performance and results. FDIC divisions and offices monitor compliance through periodic management reviews and various activity reports distributed to all levels of management. FDIC, *2021 Annual Report* (Washington, D.C.: 2022).

[11]FDIC's Division of Risk Management Supervision also identified risk related to financial technology and developed strategies to address it. For example, the division found it needed to increase its ability to effectively assess banks' use of complex models (such as those using artificial intelligence and machine learning) for decision-making and adequately supervise for model risk. Risk mitigation strategies for this risk included training and a model risk management program for staff. Other risks FDIC identified related to financial technology included risks related to third-party relationships and new financial products, staying abreast of industry trends, and examiner training.

[12]According to FDIC officials, prior to 2022, FDIC's divisions and offices conducted their own competency modeling and assessments, but in 2022, FDIC decided to bring its workforce planning processes to the corporate level and established a human capital strategic planning office within the FDIC's Administration division. Officials told us the office is currently developing leadership competencies and recently awarded a contract to a vendor to start working on technical competencies for FDIC's workforce.

Protection surveyed its staff in 2019 and 2022 to gather information about staff knowledge, experience, and interest related to different types of technologies, including financial technology. However, FDIC has not systematically collected data on its staff's technological skills or expertise related to financial technology. It also has not conducted a full formal assessment to determine the critical technological skills related to financial technology needed by its policymaking and oversight staff. FDIC officials told us that starting in 2023, they plan to begin developing technical competency models based on occupation series. They also noted that they are exploring applications that will enable FDIC to conduct skills gap assessments.[13]

- **Design strategies to address skills gaps.** FDIC partially followed this practice. In 2021, FDIC's Depositor and Consumer Protection division developed the Consumer Compliance Technology Specialist Program. The program aims to expand technical knowledge and supervision capabilities of emerging technologies as they are adopted in financial services through the use of program specialists.[14] FDIC officials also told us the Risk Management Supervision division established an Emerging Technology Section, which involved developing positions to bring in staff with subject matter expertise in areas related to financial technology, such as artificial intelligence and digital assets.[15]

  Additionally, officials told us that FDIC has provided financial technology-related training to its examiners, and developed background materials on various areas of financial technology for examination staff. However, as discussed earlier, FDIC has not fully identified its financial technology skill needs and therefore cannot develop targeted strategies to address any skill gaps in financial technology.

[13]FDIC officials told us they have not yet developed any planning documents related to these activities.

[14]The program is composed of two Regional Consumer Compliance Technology Specialists and one Washington D.C.-based Consumer Compliance Technology Specialist who serve as experts on emerging technologies and the supervisory strategies for evaluating such technologies.

[15]FDIC officials told us that recruiting for positions involved in policymaking and oversight related to financial technology is no different than the process FDIC uses for all positions within the agency and involves FDIC branches and divisions preparing descriptions for needed positions and expertise.

- **Build capabilities to support workforce planning.** FDIC generally followed this practice. FDIC officials told us they do not use any special hiring authorities for policymaking and oversight positions related to financial technology, but they have used other hiring programs to hire entry-level analysts, such as the federal CyberCorps scholarship program.[16] FDIC officials also noted that they are involved in communities of practice that OPM hosts related to workforce planning and technology across the government. Additionally, FDIC assessed its human resources systems in November 2021 for capability to support effective talent management, which involved engaging a contractor to assess the current and future state of the system based on business needs.
- **Monitor and evaluate progress.** FDIC partially followed this practice. As discussed earlier, FDIC has developed mitigation strategies to address the risks the agency identified related to financial technology. FDIC is tracking the completion of those strategies, according to its risk management documentation. Additionally, FDIC has gathered feedback from training participants for its financial technology training, according to officials. However, FDIC has not developed performance measures for or evaluated the effectiveness of its financial technology training in addressing its financial technology skill needs.

Federal Reserve

The Federal Reserve has generally followed two leading workforce planning practices, and has partially followed three others.

- **Conduct strategic workforce planning.** The Federal Reserve generally followed this practice. The Federal Reserve has conducted strategic workforce planning related to financial technology in several

[16]The CyberCorps Scholarship for Service program was created in 2000 to enhance the security of critical information infrastructure, increase the national capacity of educating information technology specialists in Information Assurance disciplines, produce new entrants into the government Information Assurance workforce, increase national research and development capabilities in Information Assurance, and strengthen partnerships between institutions of higher learning and relevant employment sectors. CyberCorps Scholarship for Service website, accessed July 13, 2023, https://sfs.opm.gov/About/History.

ways.[17] For example, the Federal Reserve's 2020–2023 agencywide strategic plan incorporates an objective aimed at aligning supervisory capabilities with financial technology innovation.[18] This includes ensuring that emerging consumer protection risks—including those from financial technology innovation—are monitored and that policies, examination programs, and outreach efforts are aligned.[19] Additionally, some Federal Reserve policymaking and oversight divisions have developed division-level strategic plans that also address workforce planning related to financial technology.[20]

- **Determine critical skills.** The Federal Reserve partially followed this practice. The Federal Reserve has identified some skill requirements related to financial technology in its position descriptions.[21] For example, its Financial Institution and Policy Analyst position is required to have the ability to learn and inform others on innovative technology implementations, such as digital currencies or distributed ledger technologies. Its Senior Data Scientist is required to lead initiatives through the application of machine learning and other

[17]The Federal Reserve System consists of three parts, including the Federal Reserve (an independent regulatory agency formally known as the Board of Governors of the Federal Reserve System) and Reserve Banks (federally chartered corporations). The Federal Reserve oversees the operations of the Reserve Banks and shares with them the responsibility for supervising and regulating certain financial institutions and activities. Workforce planning processes developed by individual Reserve Banks were outside the scope of our review. According to Federal Reserve officials, workforce training and staff development policies for examiners are generally established by the Federal Reserve rather than individual Reserve Banks.

[18]Specifically, objective 2.2 of the plan aims to improve forward-looking risk-identification and assessment capabilities to inform policy and support timely and effective risk mitigation through supervision.

[19]The Federal Reserve's agencywide strategic plan also includes broader objectives and activities related to workforce planning, including activities aimed at ensuring that the current and future workforce has the abilities, knowledge, and skills necessary to carry out the Federal Reserve's mission.

[20]For example, the Federal Reserve's Division of Consumer and Community Affairs developed a strategic plan for 2021–2024 that includes an objective aimed at improving the division's risk identification and assessment capabilities related to financial technology. Additionally, the Division of Supervision and Regulation developed a plan that states the division will continue to develop a supervisory framework and tools, and that it will implement an analytics strategy and training programs for financial technology-related risks.

[21]According to Federal Reserve officials, the Federal Reserve has a policy group that actively monitors the financial technology industry to help the Federal Reserve identify its skill needs related to financial technology.

technologies. Additionally, in 2021, the Federal Reserve collected some financial technology skillset data as part of a targeted skills inventory. Officials also told us that through its strategic planning process, the supervision division identified system-wide gaps in how the Federal Reserve System looked at financial technology.[22]

However, the Federal Reserve has not collected complete data on the technological skills or expertise related to financial technology that its staff possess. It also has not conducted a formal assessment to determine the critical technological skills needed for its policymaking and oversight staff.[23] Officials told us they have a mechanism to collect skillset data and collected annual skillset data for examination staff until 2018. However, officials said they stopped doing so because they found it more useful and practical to collect data as needed on a position or office basis instead of conducting a broader skills inventory.

- **Design strategies to address skills gaps.** The Federal Reserve partially followed this practice. In 2021, Federal Reserve officials developed the System Fintech Supervision Program to respond to gaps in how the agency approached financial technology. The program aims to facilitate knowledge sharing, build subject matter expertise, and train examiners. In addition to senior representatives from the Federal Reserve and Reserve Banks, the program consists of subject matter working groups that lead supervisory activities within their subject areas and assist in developing supervisory work programs and staff training.[24]

  Additionally, the Federal Reserve developed the Technology Lab (TechLab), a team that researches and analyzes new technologies

[22]Federal Reserve officials told us they did not conduct a skills assessment as part of this process.

[23]Officials told us they intend to conduct a skills assessment focused on cyber and information technology staff in 2023 that may look at skills that overlap with financial technology skills. As of June 2023, the Federal Reserve approved a plan for the assessment, according to officials.

[24]For example, officials told us that in 2022, the Federal Reserve established a Crypto Task Force to directly support Federal Reserve supervision staff and enhance coordination across Reserve Bank and Federal Reserve supervision policy, and legal staff working on cryptocurrency-related efforts. This included consulting with and delivering training to supervision teams and producing analysis, such as briefings and presentations. Federal Reserve officials told us that a number of Reserve Banks also have staff coordination, support, or information sharing groups related to financial technology, such as the Federal Reserve Bank of New York's Digital Transformation Supervision Council and the Federal Reserve Bank of Cleveland's Fintech Competency Group.

broadly relevant to digital currencies and other payment, clearing, and settlement activities. According to officials, the team conducts hands-on research to further the Division of Reserve Bank Operations and Payment Systems' understanding of specific technologies, broaden technical expertise, and support development of policy views and oversight frameworks for new payments technologies. The Federal Reserve has also provided staff with training on financial technology, such as training on distributed ledger technology and artificial intelligence, according to officials. However, as discussed earlier, the Federal Reserve has not fully identified its financial technology skill needs and therefore cannot fully develop targeted strategies to address any skill gaps in financial technology.

- **Build capabilities to support workforce planning.** The Federal Reserve generally followed this practice. According to officials, the Federal Reserve uses competitive compensation strategies including sign-on and retention bonuses when necessary to compete for and retain critical talent. Additionally, they told us the Federal Reserve regularly participates in events with relevant professional associations (such as the Society of Women Engineers and National Society of Black Engineers), converts technical interns into full-time roles, and participates in the CyberCorps program to the extent permitted by OPM for unappropriated agencies.
- **Monitor and evaluate progress.** The Federal Reserve partially followed this practice. The Federal Reserve monitors its performance in achieving its strategic objective on financial technology in its annual performance reports. Additionally, in 2021 and 2022, the Federal Reserve reviewed the structure of the System Fintech Supervision Program and its work plan, according to officials.[25] Officials also told us they obtain feedback from training participants. However, the Federal Reserve has not developed performance measures for or evaluated the effectiveness of its financial technology training in addressing its financial technology skill needs.

National Credit Union Administration

NCUA has partially followed four leading workforce planning practices, and has generally followed one other.

- **Conduct strategic workforce planning.** NCUA partially followed this practice. NCUA's 2022–2026 agencywide strategic plan includes a

[25]The System Fintech Supervision Program charter states that the program will be reviewed at least annually to determine whether revisions are needed. Officials told us the most recent review determined that the program was on track.

strategic objective that addresses workforce planning related to financial technology to some extent. Specifically, NCUA's plan states that emerging and innovating financial technologies, including digital assets, present opportunities and risks to the credit union system. The plan notes that the agency must identify financial services industry risks and opportunities as well as marketplace developments that may prompt regulatory or policy changes. NCUA developed strategies to address this objective, which include enhancing training for examiners. However, NCUA's 2022–2026 strategic human capital plan does not address financial technology and officials told us NCUA's new Office of Financial Technology and ACCESS has not yet participated in NCUA's workforce planning process.[26] According to officials, this office will begin participating in workforce planning in 2024.[27]

- **Determine critical skills.** NCUA partially followed this practice. NCUA identified some critical skills related to financial technology while developing the position description for its new Director of Financial Technology. According to officials, NCUA focused on technical competencies and obtained feedback from agency officials to capture the technological skills needed for this position.[28] Additionally, an NCUA official told us there are some technological requirements built into a new financial technology coordinator position that NCUA is seeking to fill in its Office of Financial Technology and ACCESS. For example, the coordinator should have prior financial technology experience and an understanding of the adoption of

[26]This office focuses in part on addressing innovation in financial technology and in the future plans to play a role in providing resources for supervisory staff, including examiners, according to officials.

[27]NCUA's strategic workforce planning process involves analyzing the current workforce, forecasting future needs, identifying existing or potential gaps, and determining human capital priorities through the appropriate composition of staffing levels, positions, competencies, and skills.

[28]The process involved conversations between officials aimed at differentiating between technological skills related to financial technology and those related to information technology, as well as determining the level of skills and competencies required, the officials explained. The technical competencies were then reviewed by an external subject matter expert in a similar position at another regulatory agency.

technology in general to make operations more effective and efficient.[29]

However, NCUA has not collected data on the technological skills or expertise related to financial technology that its policymaking and oversight staff possess. It also has not conducted an assessment to determine the critical financial technology skills its staff need. Officials told us NCUA plans to establish a steering committee to identify a list of critical skills necessary to properly manage the risk to the credit union system through the adoption, implementation, or use of financial technology, and expect to complete the list the first quarter of 2024. They also said the Office of Financial Technology and ACCESS plans to work with NCUA's human capital office to determine its skills gap and competency assessment needs in the future.

- **Develop strategies to address skills gaps.** NCUA partially followed this practice. NCUA has established a working group called the Digital Assets Working Group to facilitate knowledge sharing related to financial technology. Additionally, NCUA officials told us NCUA provided some financial technology training, and plans to provide additional training through its new Office of Financial Technology and ACCESS. However, as discussed earlier, NCUA has not fully identified its financial technology skill needs and therefore cannot fully develop strategies that are specifically targeted to address those needs.
- **Build capabilities to support workforce planning.** NCUA generally followed this practice. NCUA officials told us the agency hired a recruitment firm to assist in recruiting for the Director of Financial Technology position after facing some difficulties filling the position. To help fill other newly developed positions in its Office of Financial Technology and ACCESS, NCUA is conducting outreach to universities and posting on jobsites, according to an agency official.
- **Monitor and evaluate progress.** NCUA partially followed this practice. NCUA monitors progress toward its strategic objective on

[29]According to NCUA officials, when developing a position description, the competencies, knowledge, skills, and abilities needed for the position are identified by management. Officials added that a job analysis, which is a structured process for gathering, documenting, and analyzing information about the content, context, and requirements for the job, is conducted to validate the knowledge, skills, and abilities. The job analysis helps inform position selection and determine training needs. Additionally, officials stated that all NCUA offices complete a process every 3 years in collaboration with NCUA's human resources office to identify human capital initiatives for the offices' specific workforces.

financial technology in its annual performance plan.[30] However, NCUA has not developed performance measures for or evaluated the effectiveness of its financial technology training in addressing its financial technology skill needs.

Office of the Comptroller of the Currency

OCC has generally followed two leading workforce planning practices, partially followed two practices, and has not followed one practice.

- **Conduct strategic workforce planning.** OCC generally followed this practice. OCC's 2023–2027 agencywide strategic plan includes a goal focused on leading on supervision as the banking system evolves, which according to officials includes adapting supervision to financial innovation and financial technology. To achieve this goal over the next 5 years, OCC plans to invest time and resources in covering innovations and emerging issues that may affect safety, soundness, and fairness in banking. This includes identifying and addressing emerging challenges, such as safety and soundness risks from changes in digital technologies, such as blockchain, according to the strategic plan. Additionally, OCC's 2017–2019 workforce plan stated that OCC needs a dynamic and agile staff that can adjust to the rapidly changing financial technology arena. The plan included a goal to ensure the agency has the skills and competencies needed to support OCC's vision.[31]
- **Determine critical skills.** OCC partially followed this practice. OCC has identified some knowledge requirements related to financial technology in its position descriptions.[32] For example, OCC's National Bank Examiner and Innovation Officer position is required to have senior-level knowledge of the application and development of technology innovations affecting payment systems, lending, and wealth management. Additionally, in 2021, OCC identified bank IT competency models for its examiners that address financial technology to some extent.[33] However, OCC has not collected data

[30]For example, performance goal 1.5.1 has an indicator that includes developing training related to financial technology. NCUA, *2023 Annual Performance Plan* (Jan. 2023).

[31]OCC officials told us the agency is working on a 2023–2027 workforce plan, but the agency has not published the plan as of April 2023.

[32]OCC officials told us OCC uses a job analysis process, which includes identifying work activities and skills needed to perform a position, to identify needed skills for OCC's policy and oversight divisions.

[33]OCC identified eight bank information technology competency categories for examiners across all business lines, including one category focusing on cyber and information security and another on third party oversight.

on the technological skills or expertise related to financial technology that its staff possess. It also has not conducted an assessment to determine the critical financial technology skills its staff need.

- **Develop strategies to address skills gaps.** OCC partially followed this practice. OCC has established working groups for staff. For example, according to agency staff in one of our OCC focus groups, OCC has an artificial intelligence working group that arranges presentations from outside speakers, including vendors, about financial technology products. Additionally, officials told us OCC's Office of Innovation staff have served as technology subject matter experts for examiners and made presentations to examiners and other employees on financial technology topics. The officials noted that OCC's recently established Office of Financial Technology, which incorporates the Office of Innovation, plans to further enhance the agency's knowledge and expertise of financial technology platforms and applications in support of OCC's mission. OCC also has provided staff with training on financial technology. However, OCC has not fully identified its financial technology skill needs, and therefore cannot fully develop targeted strategies to address those needs.[34]
- **Build capabilities to support workforce planning.** OCC generally followed this practice. Officials told us that OCC has Schedule B excepted service appointment authority for examiners and Schedule A excepted service appointment authority for attorney positions.[35] OCC also hired a new Senior Deputy Comptroller for Management to help streamline and improve hiring processes, according to officials.
- **Monitor and evaluate progress.** OCC did not follow this practice. OCC's workforce planning function does not currently have any performance goals and measures, according to officials. OCC officials told us OCC is in the process of developing workforce planning goals and measures for the skill proficiencies of several OCC occupational series and plans to implement these goals and measures in 2025. Additionally, OCC conducted its first comprehensive evaluation of its

[34]In terms of recruitment, officials told us OCC staffing specialists work with each division to identify hiring needs.

[35]According to an Office of Personnel Management website, federal government civilian positions are generally in the competitive civil service. To obtain a competitive service job, individual applicants must compete with other applicants in open competition. OPM provides excepted service hiring authorities in certain circumstances under Schedules A, B, C, and D. Excepted service hiring authorities enable agencies to hire when it is not practical to use traditional competitive hiring procedures, among other things. Office of Personnel Management, "Excepted Service," website, accessed July 13, 2023, https://www.opm.gov/policy-data-oversight/hiring-information/excepted-service/.

training and development activities in 2021 and developed training goals for its examiner training. However, neither the evaluation nor the goals specifically address training related to financial technology.

Appendix III: Selected Performance Goals and Measures of Innovation Offices

The Consumer Financial Protection Bureau (CFPB), Office of the Comptroller of the Currency (OCC), and National Credit Union Administration (NCUA) have offices dedicated to addressing innovation in the financial industry, which we refer to collectively as innovation offices. The regulators' annual performance plans for fiscal year 2023 include the following selected performance goals and measures related to industry outreach or addressing innovation.[1]

Table 5: CFPB Performance Objectives and Measures for the Division of Research, Monitoring, and Regulations, Fiscal Year 2023

Objective	Performance Measure(s)
1.1 Issue rules and guidance implementing Federal consumer financial law.	• 1.1.1 Percent of notice-and-comment rulemakings completed within 2 years of announcement in the Unified Agenda[a] • 1.1.2 Percent of rules with statutory deadlines completed within statutory or other required deadline[a]
3.1 Monitor consumer financial markets to surface relevant trends and identify areas of risk to consumers.	• 3.1.1 Number of reports, issue briefs, advisories, or other actions that influence policy and consumer financial market practices[a] • 3.1.2 Monthly average number of external engagements focused on competition or emerging consumer market trends[a]
3.2 Conduct and publish research focused on: (a) experiences of underserved communities and their access to credit, (b) consumer awareness, understanding, and behavior with respect to consumer financial products and services and with respect to disclosures and related communications, and (c) market developments impacting consumers, including competition and innovation.	• 3.2.1 Number of published research products • 3.2.2 Number of citations of CFPB research products in other publications • 3.2.3 Number of new data series or sets released

Source: Consumer Financial Protection Bureau (CFPB) and GAO. I GAO-23-106168

Note: GAO analysis of CFPB 2023 Annual Performance Plan and Report, and Budget Overview.

[a]New measure for fiscal year 2023

[1]For the purposes of this appendix, a performance goal is a target level of performance expressed as a tangible, measurable objective against which actual achievement can be compared. A performance measure is the information used to monitor and report on progress toward those goals. The agencies use various terms for these goals and measures, such as a performance objective or performance indicator. OCC did not include numbered performance or strategic goals in its fiscal year 2023 plan. The strategic goals mentioned in its fiscal year 2022 annual performance plan and steps to achieve the goals mentioned in its 2023–2027 strategic plan are provided instead.

Table 6: OCC Strategic Goals, Fiscal Year 2022

	Strategic Goals
1.	The OCC fosters a safe, sound, and fair system of national banks, federal savings associations and federal branches of foreign banks and agencies of foreign banks that is a source of economic strength and opportunity that meets the evolving needs of consumers, businesses, and communities.
2.	OCC employees are engaged, prepared, and empowered to meet its mission
3.	The OCC operates efficiently and effectively.

Source: Office of the Comptroller of the Currency (OCC) and GAO. I GAO-23-106168

Note: GAO analysis of OCC Annual Performance Plan and Report, Fiscal Year 2022.

Table 7: OCC Strategic Goal Steps, Fiscal Years 2023–2027

Steps to implement strategic goals
2.1 Prioritize safeguarding the public's trust and ensure that the federal banking system is safe, sound, and fair
2.1.a Update community and stakeholder outreach programs to strengthen feedback loops and improve coverage. Emphasize that fairness is integral to safety and soundness.
2.2 Push our limits on how we communicate. Challenge our traditional communication practices, develop effective feedback loops, and be bold in seizing opportunities to tell our story and share our work with internal and external stakeholders.
2.2.a Communicate our direction, position, and expectations clearly and frequently.
2.2.c Explore and build communications capabilities such as social media, to reach stakeholders and a broader audience where they are.
2.4 Approach outreach and engagement with stakeholders strategically, especially on complex emerging issues facing the banking system.
2.4.a Review and update, as warranted, the scope and balance of recurring outreach and engagement with supervised institutions, community and public interest organizations, and other stakeholders.
2.4.b Develop outreach and engagement plans at multiple levels of the agency for engaging with community organizations, trade groups, legislators, international bodies, and other stakeholders.
3.1 Enhance the implementation of risk-based supervision, thus enabling the agency to be nimble given a changing landscape of banking activities and financial services.
3.1.a Support effective execution of risk-based supervision, including through timely adaptation to changing risks, technologies, and priorities.
3.3 Invest the time and resources necessary to cover innovations and emerging issues that may affect safety, soundness, and fairness in banking.
3.3.a Identify, assess, prioritize, and address emerging challenges, e.g. safety and soundness risks from changes in climate and digital technologies, such as blockchains, adjusting resources and supervisory priorities as needed.
3.3.b Invest in research and development capacities to support innovative approaches to supervision and regulation.
3.4 Deepen collaboration with other regulators, both domestically and internationally.
3.4.a Engage actively with domestic and international agencies, industry groups, and institutions to influence supervisory perspectives and identify emerging risks and threats to financial stability.

Steps to implement strategic goals
3.5 Promote strengthening and modernizing community banks, with a focus on small businesses and underserved communities.
3.5.b Develop guidance and outreach to facilitate community banks' safe and sound transition to digital banking, including with regards to arrangements with technology firms and supporting a level playing field. Coordinate with other agencies as much as possible.

Source: Office of the Comptroller of the Currency (OCC) and GAO. I GAO-23-106168

Note: GAO analysis of OCC Strategic Plan, Fiscal Years 2023–2027.

Table 8: NCUA Performance Goals and Indicators Identified by NCUA as Relevant to the Office of Financial Technology and ACCESS, Fiscal Year 2023

Strategic objective	Performance goal	Indicator(s)
1.5 Ensure NCUA policies and regulations appropriately address emerging and innovative financial technologies, including digital assets.	1.5.1 Evaluate and address barriers to credit union adoption of emerging financial technology, including digital assets.	• Issue a final rulemaking relating to financial technology and loan participations, issue a proposed rulemaking relating to financial technology, and develop policies, guidance, and training relating to financial technology and access issues the credit union system is experiencing.
2.1 Enhance consumer access to affordable, fair, and federally insured financial products and services.	2.1.1 Expand community and individual access to safe, fair and affordable credit union products and services through modernized NCUA regulations, policies, and programs.	• Approve at least 25 Underserved Area expansions, in accordance with regulation and agency policy. • Obtain stakeholder feedback to understand credit union challenges in providing access to safe, fair and affordable financial products to unbanked and underbanked households. • Propose at least one regulatory change to update the field of membership or chartering rules.
	2.1.2 Empower consumers with financial education information.	• Increase the reach of the NCUA's consumer financial education and literacy information.
2.2 Support and foster small, minority, low-income, and new credit unions.	2.2.1 Support the viability of credit unions.	• Maintain the level of members in Minority Depository Institution-designated credit unions at or above 2022 levels. • Conduct small credit union and Minority Depository Institutions assistance program support contacts for 100 percent of participating credit unions. • Charter at least four new credit unions by December 31, 2023.
	2.2.2 Maximize the agency's grant and loan programs.	• Increase the number of first-time Community Development Revolving Loan Fund grant applicants by at least 25 percent.

Source: National Credit Union Administration (NCUA) and GAO. I GAO-23-106168

Note: GAO analysis of NCUA 2023 Annual Performance Plan.

Appendix IV: Industry Participants' Views of Regulator Outreach

We spoke with seven industry associations representing a mixture of banks, credit unions, and non-depository financial services companies. We also spoke with representatives from four financial technology companies who were members of one of the industry associations. All of the industry participants we spoke with had engaged directly or indirectly, such as through their members, with agencies we reviewed.

All 11 industry participants mentioned agency communication related to innovation in a mostly positive light:

- Some industry participants described outreach efforts as productive, beneficial, or generally open, and others noted that regulators had been receptive to industry communication.
- A few industry participants noted that communication from regulators had gotten better recently.
- Some industry participants said some of the regulator outreach involved the agencies trying to learn more about technology developments.
- About half of the industry participants also noted concrete steps agencies had taken to help foster innovation, including publishing guidance for community banks that partner with financial technology companies and on third-party partnerships or conducting technology sprint events that produce tangible outcomes.

The majority of industry participants also called for, or noted the benefit of, additional agency engagement. For example, some industry participants suggested that to better foster innovation, agencies could conduct more proactive collaboration with direct interaction and develop guidance that addresses technological developments.

Industry participants had the following observations and suggestions for improvement:

- **Regulatory clarity or guidance.** Three of the 11 participants said that lack of regulatory clarity hampered innovation. They noted that industry participants cannot predict how regulators will react to new technology and relevant regulatory guidance is not always available. As a result, companies operate in a risky gray area as they await clarity, one said. Another said companies may avoid innovative products or partnerships. For example, this participant said many companies believed regulators to be initially wary of cloud computing—delivering applications or technology infrastructure via the internet rather than being installed on a local machine—which slowed development and progress in adopting the technology. Lastly, a few industry participants also said that prior to recent guidance on third party partnerships, banks were hesitant to partner with financial technology companies out of fear of regulatory scrutiny.

- **Collaboration.** While participants noted that communication was generally positive, a few noted the usefulness of collaboration or that additional collaboration with industry would be beneficial. For example, a few participants noted that while regulators focus on analyzing certain types of industry data, analysis of other data could significantly enhance innovation, such as analysis of equity or fairness outcomes for financial technology products and services relative to traditional financial products and services.
- **Reactive versus proactive efforts.** Four industry participants said that agencies were either reactive to innovation or would benefit from being more proactive in their efforts. For example, one industry participant said regulators were slow to assess the impact of "buy now, pay later" and earned wage access technologies, which hampered innovation.[1] Another industry participant suggested regulators take steps to encourage adoption of new technologies. For example, regulators could proactively conduct independent assessments of the technology for regulatory compliance rather than relying on individual companies to reach out to the regulators. Alternatively, regulators could issue guidance clarifying the circumstances under which adoption of advanced technology may generally improve performance or which outcomes for consumers would not be held against an industry participant. For example, efficiency gains from cloud computing could improve performance, or regulatory sandbox test results could be incorporated into guidance about consumer outcomes.
- **Canceled outreach programs.** Three industry participants noted that sandboxes or no-action letters were useful tools for fostering innovation. A few noted CFPB's cancellation of the agency's sandbox and no-action letter programs, with one describing it as a step backward that hampered innovation. However, one noted that while the sandbox program was operating, some industry participants had difficulty getting feedback or had concerns that regulators would learn

[1]For more information about earned wage access financial products, see GAO, *Financial Technology: Products Have Benefits and Risks to Underserved Consumers, and Regulatory Clarity Is Needed*, GAO-23-105536 (Washington, D.C.: Mar. 8, 2023).

information from participants' actions during the program that could later be used against the participants.

Industry participants noted that agencies face structural constraints on their ability to foster innovation:

- **Balance between innovation and oversight.** Six of the 11 industry participants noted agencies must balance between fostering innovation and providing oversight. One noted that agencies are meant to assess risk, and that they are designed to be risk-averse in their overall missions.
- **Sensitivity to appearance of bias.** Two industry participants acknowledged that there is sensitivity around agencies appearing biased toward a particular company, type of company, or technology. One noted this can get in the way of regulators collaborating on a specific technology project or fostering innovation by, for example, conducting collaborative research.

Appendix V: Hiring and Separation for Selected Agency Policymaking and Oversight Offices, 2018–2022

According to the prudential regulators—Federal Deposit Insurance Corporation (FDIC), Board of Governors of the Federal Reserve System (Federal Reserve), National Credit Union Administration (NCUA), and Office of the Comptroller of the Currency (OCC)—and the Consumer Financial Protection Bureau (CFPB), most staff involved with policymaking and oversight related to financial technology are generalist staff, such as examiners, enforcement attorneys, or policymaking staff rather than staff with technology-oriented positions. Agency officials also told us the agencies did not capture data that would readily allow them to identify all staff involved in financial technology policymaking and oversight. Accordingly, a direct comparison of agency hiring and separation for technology-oriented and non-technology oriented positions was not feasible.

The tables below present data on hiring and separation (including resignation, termination, retirement, and transfers) for the primary policymaking and oversight divisions or offices of the prudential regulators and CFPB.[1] The tables also include information about the agencies' offices of innovation, where available. We reviewed the information for omissions and impossible values, and found them sufficiently reliable for our purposes.

Consumer Financial Protection Bureau

Table 9: Consumer Financial Protection Bureau (CFPB) Hiring Counts, 2018–2022

Divisions Offices	2018	2019	2020	2021	2022	Total
Research, Monitoring, and Regulations[a]						
Markets	0	0	1	8	14	**23**
Regulations	0	4	9	5	4	**22**
Research	0	14	11	14	9	**48**
Research, Monitoring, and Regulations, front office	1	0	3	0	1	**5**
Supervision, Enforcement, and Fair Lending						
Enforcement	0	5	14	26	30	**75**
Supervision Examinations	0	0	9	4	3	**16**

[1]We obtained counts at the division level for the Federal Reserve due to its organizational structure, which includes a larger number of offices within each division relative to other agency organizational structures. Some agencies provided data that did not include certain hiring or separation types (such as transfers), which we indicate with table notes where appropriate. With the exception of CFPB, which provided underlying data, the tables represent summary information provided by the agencies.

Divisions Offices	2018	2019	2020	2021	2022	Total
Supervision Midwest Region	0	0	15	8	16	**39**
Supervision Northeast Region	0	0	14	11	1	**26**
Supervision Policy	2	3	8	8	9	**30**
Supervision Southeast Region	0	0	6	8	4	**18**
Supervision West Region	0	0	18	6	1	**25**
Supervision, Enforcement, and Fair Lending, front office	0	1	2	0	0	**3**

Source: GAO analysis of CFPB data. I GAO-23-106168

[a]Information on the Office of Competition and Innovation, which is housed within the Division of Research, Monitoring, and Regulations was not broken out in the hiring and separation data provided. However, according to agency officials, the office had eight staff as of May 2023.

Table 10: Consumer Financial Protection Bureau (CFPB) Separation Counts, 2018–2022

Divisions Offices	2018	2019	2020	2021	2022	Total
Research, Monitoring, and Regulations[a]						
Markets	0	0	0	5	6	**11**
Regulations	10	5	2	4	6	**27**
Research	8	13	7	5	12	**45**
Research, Monitoring, and Regulations - front office	0	0	1	0	0	**1**
Supervision, Enforcement, and Fair Lending						
Enforcement	12	12	4	9	11	**48**
Supervision Examinations	4	4	8	6	2	**24**
Supervision Midwest Region	10	14	9	3	10	**46**
Supervision Northeast Region	9	9	4	3	5	**30**
Supervision Policy	3	7	5	5	2	**22**
Supervision Southeast Region	7	4	5	8	8	**32**
Supervision West Region	13	10	5	6	8	**42**
Supervision, Enforcement, and Fair Lending, front office	2	3	0	3	2	**10**

Source: GAO analysis of CFPB data. I GAO-23-106168

Note: Separations include resignation, termination, retirement, and transfers.

[a]Information on the Office of Competition and Innovation, which is housed within the Division of Research, Monitoring, and Regulations was not broken out in the hiring and separation data provided. However, according to agency officials, the office had eight staff as of May 2023.

Federal Deposit Insurance Corporation

Table 11: Federal Deposit Insurance Corporation (FDIC) Hiring Counts, 2018–2022

Divisions Branches	2018	2019	2020	2021	2022	Total
Risk Management Supervision						
Supervision and Policy[a]	N/A[b]	N/A[b]	N/A[b]	0	0	**0**
Capital Markets and Accounting Policy[a]	N/A[b]	N/A[b]	N/A[b]	0	2	**2**
Operations	N/A[b]	N/A[b]	0	0	0	**0**
Operational Risk[a]	1	0	0	1	0	**2**
Depositor and Consumer Protection						
Compliance and Community Reinvestment Act Examinations[a]	0	0	0	0	1	**1**
Policy and Research[a]	0	3	0	0	4	**7**
Consumer and Community Affairs	9	3	5	9	7	**33**
Administrative Management and Operations	5	0	1	0	1	**7**
Chief Information Officer Organization[c]						
FDITECH	N/A[b]	0	0	8	0	**8**
Legal						
Office of the General Counsel	0	1	0	2	1	**4**
Litigation	0	3	9	0	7	**19**
Corporate Operations	8	8	7	7	5	**35**
Supervision, Legislation, and Enforcement	3	1	6	14	9	**33**
Resolutions and Receivership	N/A[b]	N/A[b]	1	2	2	**5**

Source: FDIC. I GAO-23-106168

[a]According to FDIC, these offices require specialized experience or formal commissions, which means that vacancies are typically filled through internal promotions or lateral assignments, rather than outside hires.

[b]N/A means that the branch did not exist in this year.

[c]This is presented as the parent office of FDITECH.

Table 12: Federal Deposit Insurance Corporation (FDIC) Separation Counts, 2018–2022

Divisions Branches	2018	2019	2020	2021	2022	Total
Risk Management Supervision						
Supervision and Policy	N/A[a]	N/A[a]	N/A[a]	1	5	6
Capital Markets and Accounting Policy	N/A[a]	N/A[a]	N/A[a]	1	3	**4**

Divisions						
Branches	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
Operations	N/A[a]	N/A[a]	4	3	5	**12**
Operational Risk	0	2	3	2	4	**11**
Depositor and Consumer Protection						
Compliance and Community Reinvestment Act Examinations	1	3	2	2	0	**8**
Policy and Research	1	1	0	3	3	**8**
Consumer and Community Affairs	11	11	10	8	12	**52**
Administrative Management and Operations	2	4	2	4	1	**13**
Chief Information Officer Organization[b]						
FDITECH	N/A[a]	0	0	0	1	**1**
Legal						
Office of the General Counsel	0	2	0	0	5	**7**
Litigation	12	8	6	6	7	**39**
Corporate Operations	5	10	5	7	8	**35**
Supervision, Legislation, and Enforcement	13	22	11	11	13	**70**
Resolutions and Receivership	N/A[a]	N/A[a]	4	3	5	**12**

Source: FDIC. I GAO-23-106168

Note: Separations include resignation, termination, retirement, and transfers.

[a]N/A means that the branch did not exist in this year.

[b]This is presented as the parent office of FDITECH.

Federal Reserve

Table 13: Board of Governors of the Federal Reserve System (Federal Reserve) Hiring Counts, 2018– 2022

Divisions	2018	2019	2020	2021	2022	Total
Division of Reserve Bank Operations and Payment Systems[a]	14	21	18	17	18	**88**
Division of Supervision and Regulation	36	38	43	28	50	**195**
Division of Consumer and Community Affairs	7	12	7	12	17	**55**
Legal Division	6	9	7	5	14	**41**

Source: Federal Reserve. I GAO-23-106168

Note: Includes hires but not transfers.

[a]Information on the Tech Lab, which is housed within the Division of Reserve Bank Operations and Payment Systems, was not broken out in the hiring and separation data provided. However, according to officials the Tech Lab had four staff as of March 2023.

Table 14: Board of Governors of the Federal Reserve System (Federal Reserve) Separation Counts, 2018–2022

Divisions	2018	2019	2020	2021	2022	Total
Division of Reserve Bank Operations and Payment Systems[a]	15	18	24	17	26	**100**
Division of Supervision and Regulation	34	39	43	40	74	**230**
Division of Consumer and Community Affairs	5	11	8	11	14	**49**
Legal Division	9	9	7	6	14	**45**

Source: Federal Reserve. I GAO-23-106168

Note: Separations include resignation, termination, retirement, and transfers.

[a]Information on the Tech Lab, which is housed within the Division of Reserve Bank Operations and Payment Systems, was not broken out in the hiring and separation data provided. However, according to officials the Tech Lab had four staff as of March 2023.

National Credit Union Administration

Table 15: National Credit Union Administration (NCUA) Hiring Counts, 2018–2022

Offices	2018	2019	2020	2021	2022	Total
Office of Examination and Insurance	5	7	1	0	0	**13**
Office of National Examination and Supervision	1	3	0	2	1	**7**
Office of Consumer Financial Protection	0	0	0	4	4	**8**
Office of the General Counsel	9	6	3	1	3	**22**
Office of Financial Technology and ACCESS	N/A[a]	N/A[a]	N/A[a]	N/A[a]	N/A[a]	**N/A**[a]
Eastern Region[b]	6	10	25	26	28	**95**
Southern Region[b]	12	23	13	20	17	**85**
Western Region[b]	14	21	30	16	22	**103**

Source: NCUA. I GAO-23-106168

[a]N/A means that the office did not exist in this year.

[b]NCUA reorganized its regional office structure in 2019 and went from five regional offices to three regional offices. NCUA aggregated the 2018 and 2019 data presented here according to the current region to which the staff would have been assigned.

Table 16: National Credit Union Administration (NCUA) Separation Counts, 2018–2022

Offices	2018	2019	2020	2021	2022	Total
Office of Examination and Insurance	7	3	2	9	5	**26**
Office of National Examination and Supervision	5	1	1	1	3	**11**

Offices	2018	2019	2020	2021	2022	Total
Office of Consumer Financial Protection	1	0	3	4	1	**9**
Office of the General Counsel	2	4	3	1	3	**13**
Office of Financial Technology and ACCESS	N/A[a]	N/A[a]	N/A[a]	N/A[a]	N/A[a]	**N/A**[a]
Eastern Region[b]	7	14	10	18	31	**80**
Southern Region[b]	25	9	14	17	19	**84**
Western Region[b]	14	18	18	22	17	**89**

Source: NCUA. I GAO-23-106168

Note: Separations include resignation, termination, retirement, and transfers.

[a]N/A means that the office did not exist in this year.

[b]NCUA reorganized its regional office structure in 2019 and went from five regional offices to three regional offices. NCUA aggregated the 2018 and 2019 data presented here according to the current region to which the staff would have been assigned.

Office of the Comptroller of the Currency

Table 17: Office of the Comptroller of the Currency (OCC) Hiring Counts, 2018–2022

Departments	2018	2019	2020	2021	2022	Total
Bank Supervision Policy[a]	2	0	4	9	5	**20**
Chief Counsel's Office	3	1	2	11	8	**25**
Large Bank Supervision	13	13	15	28	60	**129**
Midsize and Community Bank Supervision	64	60	121	160	61	**466**
Supervision Risk and Analysis	6	0	4	18	9	**37**

Source: OCC. I GAO-23-106168

Note: OCC hiring counts do not include transfers.

[a]Information on the Office of Innovation, which is housed within the Department of Bank Supervision Policy was not broken out in the hiring and separation data provided. However, according to agency officials, the Office of Financial Technology—which expanded upon the Office of Innovation—had eight employees as of May 2023.

Table 18: Office of the Comptroller of the Currency (OCC) Separation Counts 2018–2022

Departments	2018	2019	2020	2021	2022	Total
Bank Supervision Policy[a]	1	4	10	12	13	**40**
Chief Counsel's Office	1	4	10	22	10	**47**
Large Bank Supervision	47	74	56	47	70	**294**
Midsize and Community Bank Supervision	86	144	124	117	169	**640**
Supervision Risk and Analysis	6	10	16	15	13	**60**

Source: OCC. I GAO-23-106168

Note: Separations include resignation, termination, retirement, but not transfers.

[a]Information on the Office of Innovation, which is housed within the Department of Bank Supervision Policy was not broken out in the hiring and separation data provided. However, according to agency officials the Office of Financial Technology—which expanded upon the Office of Innovation—had eight employees as of May 2023.

Appendix VI: Comments from the Consumer Financial Protection Bureau

Consumer Financial Protection Bureau

1700 G Street NW, Washington, D.C. 20552

August 22, 2023

Michael E. Clements
Director
Financial Markets and Community Investment
Government Accountability Office
441 G Street, NW
Washington DC, 20548

Dear Mr. Clements,

Thank you for the opportunity to review and comment on the draft report by the Government Accountability Office (GAO), titled *Financial Technology: Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices* (GAO-23-106168). The rapid advancement of financial technology has major implications for consumers and businesses alike. It is vital that financial regulators are well equipped to address how technology is transforming financial services. I am committed to ensuring the CFPB has the skills and expertise needed to address these challenges, and I appreciate GAO's important work on this subject.

The GAO's report examines the financial technology expertise of the Consumer Financial Protection Bureau, Federal Deposit Insurance Corporation, Board of Governors of the Federal Reserve System, National Credit Union Administration, and Office of the Comptroller of the Currency. In particular, the report assesses the technological skills and expertise of regulators' staff, regulators' workforce planning practices related to financial technology, how regulators address innovation in financial technology, and how regulators use technology to improve their respective supervisory capabilities.

consumerfinance.gov

The GAO's report is timely, given the reforms we have recently put into place to augment the CFPB's existing financial technology expertise. For instance, in 2022, the CFPB developed a Technologist program that embeds staff with technical expertise in areas such as data science and machine learning throughout the agency. Similarly, the CFPB completed a review of its Office of Innovation and identified several challenges. First, we found that the Office was poorly integrated with key functions of the CFPB, including those that conducted monitoring of consumer financial product markets and those focused on regulations. Second, we identified that the Office's initiatives to provide firm-specific exemptions to existing law was exploited by participating firms to convey, either implicitly or explicitly, exclusivity of special privileges or endorsement by the CFPB. Third, we found that the Office's activities did not appear to have any meaningful impact on entry by new market participants. As a result, we have revamped this office to be embedded within the Division of Research, Monitoring, and Regulations. We have also given the office a clearer mandate to identify ways to promote entry by new market participants and competition, which is specifically delineated by Congress as a core objective of the CFPB. The Office of Competition and Innovation is now pursuing a number of fruitful initiatives.

In the report, GAO makes 12 recommendations for executive action, three of which are directed to the CFPB: (1) fully incorporate leading workforce planning practices in the primary offices involved in policymaking and oversight related to financial technology; (2) develop performance goals and measures for the Office of Competition and innovation; and (3) develop performance measures that are specific to the CFPB's strategic objectives related to supervisory technologies.

The CFPB appreciates these recommendations and looks forward to continuing to work with GAO as it monitors the CFPB's progress implementing these recommendations.

Sincerely,

Rohit Chopra

Rohit Chopra
Director

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Appendix VII: Comments from the Federal Deposit Insurance Corporation

FDIC
Federal Deposit Insurance Corporation
550 17th Street NW, Washington, D.C. 20429-9990

Division of Risk Management Supervision
Division of Depositor and Consumer Protection

August 23, 2023

Michael Clements
Director
Financial Markets and Community Investment
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Clements:

The Federal Deposit Insurance Corporation (FDIC) appreciates the opportunity to review the GAO draft report *Financial Technology: Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices* (Report) (GAO-23-106168). The Report examines regulators' financial technology expertise.

The Report contains one recommendation to the FDIC, along with a similar recommendation to other regulators. The Report recommends that "The Chair of the Federal Deposit Insurance Corporation should fully incorporate leading workforce planning practices for the primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology related training in addressing skill needs." We appreciate that the Report recognizes and reflects that the FDIC has been incorporating leading workforce planning practices.

The FDIC is committed, and takes a number of measures, to ensure staff across the FDIC have the appropriate skillsets to perform their duties. This includes, but is not limited to, skillsets related to financial technology. These measures include a range of processes, including the hiring process, training initiatives, workforce planning, and performance management processes, among others. More specific to financial technology, the FDIC has established, and continues to develop, dedicated resources in a number of divisions to ensure appropriate skills are in place for policymaking and oversight staff related to financial technology. The FDIC's approach to ensuring that appropriate skills are in place takes into consideration the FDIC's ongoing monitoring of trends, adoption levels, and risks of various emerging technology developments in the industry. Such monitoring has informed the FDIC's resource needs and resulted in dedicating resources as well as developing and delivering training.

The FDIC will continue its ongoing efforts to ensure staff involved in policymaking and oversight have the appropriate skillsets related to financial technology needed to fulfill the FDIC's mission, including related to safety and soundness and consumer protection supervision. As part of its ongoing efforts, the FDIC will consider additional workforce planning practices identified in the Recommendation.

Mr. Clements, Director
Page 2

Thank you for your efforts and if you have any questions or need additional follow-up information, please do not hesitate to contact Management Analyst Megan Patzwall at (703) 562-2627 or mpatzwall@fdic.gov.

Sincerely,

DOREEN EBERLEY Digitally signed by DOREEN EBERLEY Date: 2023.08.23 17:54:18 -04'00'

Doreen R. Eberley
Director, Division of Risk Management Supervision

MARK PEARCE Digitally signed by MARK PEARCE Date: 2023.08.23 18:08:44 -04'00'

Mark Pearce
Director, Division of Depositor and Consumer Protection

Appendix VIII: Comments from the Board of Governors of the Federal Reserve System

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
WASHINGTON, D. C. 20551

DIVISION OF
SUPERVISION AND REGULATION

August 21, 2023

Michael E. Clements, Director, Financial Markets and Community
Investment Team
United States Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Clements:

Thank you for providing the Board of Governors of the Federal Reserve System ("Board") with an opportunity to review the final draft of the Government Accountability Office ("GAO") report titled: *Financial Technology: Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices* (GAO-23-106168). The GAO's report reviews regulators' financial technology expertise, including the technological skills or expertise of regulators' staff; regulators' workforce planning practices; how regulators address innovation in financial technology; and how regulators use technology to improve their supervisory capabilities. We appreciate the report's recognition of the federal banking regulators' efforts to enhance staff skills and expertise for policymaking and oversight by developing positions, programs, and training related to financial technology.

The GAO's report makes two recommendations to the Board:

The Chair of the Board of Governors of the Federal Reserve System should fully incorporate leading workforce planning

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2

practices in the primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology training in addressing skill needs.

The Chair of the Board of Governors of the Federal Reserve System should develop performance measures that are specific to its strategic objectives related to supervisory technologies.

Workforce Planning Practices Related to Financial Technology

The Board recognizes the importance of ensuring Federal Reserve staff have the skills and expertise needed to effectively develop policy and conduct oversight related to supervised institutions' use of rapidly changing financial technology. To that end, the Federal Reserve has used strategic initiatives and targeted and ongoing training to enhance the knowledge of financial technology in our supervisory and policy workforce. In addition, the Federal Reserve has conducted point-in-time inventories of staff skills in response to identified business needs, including an inventory of financial technology-related skills that is scheduled to be completed in the near future. With respect to the report's recommendation on this topic, the Federal Reserve understands the value of implementing key workforce planning practices. Consequently, the Board will evaluate potential enhancements to its processes and expectations, including collecting skill data and developing strategies to address any related skill gaps related to financial technology, to best address this recommendation.

Performance Measures Related to Supervisory Technology Strategic Objectives

The Federal Reserve is committed to leveraging technology to continue enhancing its supervisory efforts, and, as such, regularly evaluates the technology its supervision offices use. In that regard, all programs within the Board's Division of Supervision and Regulation, not just the programs used to supervise large financial institutions, are assessed using annual Performance Management Assessments ("PMAs"). These assessments ensure that the programs meet business expectations and are reliable, stable, and secure.

Within the PMAs, each program is given an overall evaluation of "strong," "effective," "marginally effective," or "requires improvement." Programs are also given ratings within seven categories or "pillars": (1) technology architecture; (2) availability management; (3) customer experience; (4) information security; (5) portfolio management; (6) program and project management; and (7) financial planning.

Through the PMA process, the Division of Supervision and Regulation identifies strengths as well as weaknesses that need to be addressed within each program. It also provides specific feedback and performance improvement opportunities to each program. However, we recognize that, through these evaluations, the Federal Reserve can better assess its progress towards its strategic objective related to supervisory technology. As such, the Federal Reserve is committed to developing performance measures that address the agency's strategic objectives related to supervisory technologies.

We appreciate the GAO's review of the technical expertise of regulators' staff and for the opportunity to comment.

Sincerely,

Michael Gibson
Director

Appendix IX: Comments from the National Credit Union Administration

National Credit Union Administration
Office of the Executive Director

August 21, 2023

SENT BY EMAIL

Mr. Michael E. Clements
Director, Financial Markets & Community Investment
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548
ClementsM@gao.gov

Dear Director Clements:

Thank you for the opportunity to provide comments on the GAO's draft report (GAO 23-106168) entitled *Financial Technology: Agencies Can Better Support Workforce Expertise and Measure the Performances of Innovation Offices.*

The GAO makes the following recommendations related to the NCUA in the draft report:

Recommendation 1

The Chair of the National Credit Union Administration should fully incorporate leading workforce practices in the primary offices involved in policymaking and oversight related to financial technology by conducting strategic workforce planning that addresses financial technology; collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology training in addressing skill needs.

The NCUA concurs with this recommendation. The NCUA conducts the full Guided Inquiry (GI) process triennially, with the next occurrence of the full GI process beginning in 2024. The GI process incorporates leading workforce planning practices and affords workforce leaders the opportunity to identify positions and associated skills/competencies needed to accomplish the varied missions. During the GI process, information collected and analyzed include data on staff skillsets, skills gaps, training and development needs, and estimations of future requirements. As specified in the report, the Office of Financial Technology and ACCESS (Office) was established in January 2023 and has not yet participated in the GI process.

During the 2024 GI process, the NCUA will incorporate data collection specific to current staff financial technology skills and financial technology skills gaps. As needed, NCUA will then develop and implement examiner training and development solutions to address identified financial technology skills gaps.

1775 Duke Street – Alexandria, VA 22314-3428 – 703-518-1175

National Credit Union Administration
Office of the Executive Director

Recommendation 2

The Chair of the National Credit Union Administration should develop performance goals and measures for NCUA's Office of Financial Technology and ACCESS that cover key aspects of the office's activities, such as outreach to industry participants and that are clear, targeted, and measurable.

The NCUA concurs with this recommendation. The NCUA will develop performance goals and measures for the Office that aligns to the NCUA Strategic Plan (2022 – 2026).

Recommendation 3

The Chair of the National Credit Union Administration should develop performance measures that are specific to its strategic objectives related to supervisory technologies.

The NCUA concurs with this recommendation. The NCUA will develop specific performance measures regarding strategic objectives related to supervisory technologies for consideration by the NCUA Board as part of the 2024 NCUA Annual Performance Plan.

Thank you for the opportunity to comment.

Sincerely,

Digitally signed by RENDELL JONES
Date: 2023.08.21 17:06:39 -04'00'

Rendell Jones
Deputy Executive Director

1775 Duke Street – Alexandria, VA 22314-3428 – 703-518-1175

Appendix X: Comments from the Office of the Comptroller of the Currency

Office of the Comptroller of the Currency

Washington, DC 20219

August 24, 2023

Mr. Michael Clements
Director, Financial Markets and Community Investment
U. S. Government Accountability Office
Washington, DC 20548

Dear Mr. Clements:

Thank you for providing the Office of the Comptroller of the Currency (OCC) an opportunity to review the Government Accountability Office's (GAO) draft report titled *Financial Technology: Agencies Can Better Support Workforce Expertise and Measure the Performance of Innovation Offices*. Technical edits have been provided separately.

As part of this review, the GAO has provided the following three recommendations to the OCC.

The Comptroller of the Currency should fully incorporate leading workforce planning practices in OCC's primary offices involved in policymaking and oversight related to financial technology by collecting staff skillset data and determining the critical financial technology skills the agency needs; developing targeted strategies to address financial technology-related skills gaps; and measuring the effectiveness of its financial technology-related training in addressing skill needs. (Recommendation 10)

The Comptroller of the Currency should develop performance goals and measures for OCC's Office of Financial Technology that cover key aspects of the office's activities, such as outreach to industry participants, and that are clear, targeted, and measureable. (Recommendation 11)

The Comptroller of the Currency should develop performance measures that are specific to OCC's strategic objectives related to supervisory technologies. (Recommendation 12)

The OCC charters, supervises, and regulates national banks, federal savings associations, and foreign branches to ensure they operate in a safe and sound manner, provide fair access to financial services, treat customers fairly, and comply with applicable laws and regulations.

In carrying out its mission, the OCC employs a risk-based supervision approach focused on evaluating risk, identifying material and emerging concerns, and requiring banks to take timely corrective action before deficiencies compromise their safety and soundness. The risk-based supervision approach includes consideration of systemic risks and banks that pose the greatest risk to the federal banking system. Utilizing this approach provides the OCC the ability to allocate its resources to areas of higher risk, which may include risks associated with fintech products and services. Additionally, this risk-based approach allows the agency to invest the time and resources necessary to be knowledgeable and credible on innovations and emerging trends and practices that affect the banking industry, including those related to fintech, and to continue to provide effective supervision as the industry evolves.

To address GAO's recommendations, the agency will develop planned actions for each recommendation by the third quarter of 2024.

If you need additional information, please contact Krista LaBelle, Acting Associate Deputy Comptroller for Bank Supervision Policy, at (202) 649-6221.

Sincerely,

G. N. Gardineer

Grovetta N. Gardineer
Senior Deputy Comptroller for Bank Supervision Policy

2

Appendix XI: GAO Contact and Staff Acknowledgments

GAO Contact

Michael E. Clements, (202) 512-8678 or clementsm@gao.gov

Staff Acknowledgments

In addition to the contact named above, Kevin Averyt (Assistant Director), Erika Navarro (Analyst in Charge), Evelyn Calderon, Gabrielle Crossnoe, Garrett Hillyer, Jill Lacey, Marc Molino, Kirsten Noethen, Rebecca Sero, and Richard Zarrella made key contributions to this report.

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