DELAWARE IN A FINTECH FUTURE

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FIRST STATE FINTECH LAB

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UNIVERSITY OF DELAWARE
BIDEN SCHOOL OF PUBLIC POLICY & ADMINISTRATION

A joint report from the Delaware Prosperity Partnership, the First State Fintech Lab, and the University of Delaware's Institute for Public Administration.

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Executive Summary

The rise of fintech—the use of technology and innovation to provide financial products and services—is transforming the financial services landscape and will be a key growth opportunity for the Delaware economy in the years to come. The nearly 48,000 jobs in Delaware's broad financial activities sector are distributed across firms of all shapes and sizes—with established financial services firms such as JPMorgan Chase, Bank of America, Capital One, WSFS, and

M&T Bank operating alongside payments pioneers like PayPal and fast-growth, early- to mid-stage companies like Acorns, College Ave Student Loans, Fair Square Financial, Marlette Funding, and SoFi.

In recognition of the ongoing transformation of the financial services sector and the considerable assets Delaware has to offer this space, the Delaware Prosperity Partnership, the First State Fintech Lab, and the University of Delaware's Institute for Public Administration partnered to produce an in-depth report aimed at building a shared understanding of Delaware's position within the broader national and global fintech landscape, and providing a foundation for ongoing conversations about Delaware's fintech future.

Key Findings and Considerations

- Global investment in fintech-related companies rose from $18.9 billion in 2013 to $111.8 billion in 2018. The United States accounted for $52.5 billion in 2018, with about 60 percent of U.S. investment concentrated in the Bay Area and New York. Delaware accounted for at least $50 million in fintech investment—approximately 75 percent of all fintech investment in the Philadelphia region—though these figures most likely do not capture significant equity investments in fast-growth Delaware firms like Marlette Funding and Fair Square Financial. Like most regions outside of the Bay Area and New York, Delaware lacks a robust environment of locally-based venture firms, but the state's base of leading banks could provide a competitive advantage given that corporate venture arms accounted for $4.4 billion in fintech investment in the United States in 2018.

- Delaware ranks highly on measures of fintech innovation. Between 2009 and 2018, 199 fintech patents were assigned to Delaware-based individuals and companies, ranking first in the United States on a per capita basis, and fifth in absolute terms.

- While large states like California, New York, and Texas are home to the largest financial services workforces in absolute terms, Delaware has the highest relative concentration of financial services jobs of any U.S. state. The financial services sector accounts for 9 percent of all jobs in Delaware, a figure nearly twice the U.S. average. Using the same metric to compare U.S. counties, New Castle County ranks third, trailing only Hudson County, New Jersey (Jersey City), and New York County, New York (Manhattan). Delaware also ranks highly in its concentration of technology workers, ranking seventh in the United States behind Washington, D.C., Virginia, Washington state, Maryland, Colorado, and Massachusetts, and just ahead of California.

- The hub of Delaware's financial services industry—Wilmington, in New Castle County—sits within the seventh-largest metropolitan area in the United States, with nearly 170,000 financial services workers and more than 100,000 technology workers across the metropolitan labor market.

Delaware has a unique value proposition for fintech firms of all shapes and sizes. Continued coordination, innovation, and investment by a range of private and public sector stakeholders—including incumbent and early-stage firms, the wider business community, state and local government, nonprofit intermediaries, universities, and workforce training programs—will be critical to position the state as a fintech leader in the coming years.

- Even with the surge in investment activity and financial services innovation in recent years, the industry, on net, continues to consolidate nationally. This trend is even more stark in Delaware, where financial services firms with at least 250 employees accounted for 91 percent of statewide financial services employment in 2017, up from 88 percent in 2007. Furthermore, financial services firms operating for at least 10 years accounted for 93 percent of Delaware's financial services employment, up from 88 percent in 2007.

- So-called "bright-outlook" occupations in the financial services industry (occupations projected by the U.S. Bureau of Labor Statistics to experience at least 10 percent employment growth or 100,000 job openings nationally over the 2016–2026 period) reveal an industry that increasingly prizes technology skills and abilities. Bright-outlook finance jobs include software developers, information security analysts, and financial quantitative analysts, all occupations that demand more advanced technological skills. Analysis of real-time job postings in Delaware revealed that among the 20 financial services firms with the most job openings in 2018, tech positions—primarily software developers, but also computer systems engineers, information security analysts, and more—accounted for nearly one in five openings at those firms, equating to approximately 2,500 openings.

- Delaware is home to a wide range of targeted education and training initiatives, from K–12 programs like Delaware Pathways to a range of postsecondary offerings. These include innovative short-term programs like Zip Code Wilmington, associate degree programs at Delaware Technical Community College, and bachelor's and advanced degree programs at the University of Delaware, Delaware State University, Goldey-Beacom College, and Wilmington University. The number of graduates across tech-related programs at the University of Delaware has increased by approximately 30 percent since 2015, with Zip Code Wilmington nearly doubling its cohort size between December 2015 and July 2018. Local institutions are working to grow their offerings and enrollments, with potential growth in the CS+X model pairing computer science with another major, as well as in non-credit offerings where individuals can obtain discrete training and credentials.

- Governments around the country and world are exploring a range of options to encourage fintech investment. More than 40 nations have pursued initiatives to support financial services innovation, from creating new offices designed to interface with fintech companies, to regulatory adjustments, to direct national investments in companies. The United Kingdom has been an international leader in the implementation of a fintech regulatory sandbox, which has also been adopted by several states like Arizona, Wyoming, and Utah. In the absence of comprehensive federal action to date, innovation offices and initiatives have been established at a number of federal financial regulatory agencies. The OCC's proposal to offer fintech firms the opportunity to receive a national bank charter represents a significant milestone and agencies such as the CFPB and the CFTC are offering aggressive proposals to modernize regulatory structures for the sector.

- Creative collaborations among the public sector, private sector, higher education, and other partners provide instructive case studies of tech and fintech talent initiatives. To meet Amazon's HQ2 needs, the State of Virginia, Virginia Tech, and a range of additional public and private partners collaborated to create the Virginia Tech Innovation Campus. Louisiana used economic development incentive funds to expand the computer science program at Louisiana State University (LSU) as a draw for IBM to open a new 800-employee technology center. New York City shepherded the creation of Cornell Tech on city-owned land, which now serves as a key asset for employers across the city. And the Georgia FinTech Academy is a recent collaboration between the state's fintech industry and the University System of Georgia to prepare fintech workers through degree programs, educational certificate courses, and apprenticeships and internships.

Delaware's ongoing competitiveness in the evolving global financial services landscape will depend on sustained, collaborative efforts across a range of issues. Supporting continued talent development will be key, with continued dialogue around how to best align education and training programs with the needs of local fintech employers. Embracing a regional view could make Delaware an even more appealing fintech location, with potential efforts focused on making Delaware increasingly accessible to financial services talent across the greater metropolitan area and seeking out opportunities to work more closely with leading institutions such as the University of Pennsylvania, Drexel University, and Temple University. Other focus areas could include exploring innovative regulatory approaches, deepening relationships with venture capital sources, and expanding fintech business networks and incubators to help emerging companies learn and grow.

Delaware has a unique value proposition for fintech firms of all shapes and sizes, and its existing strengths create a strong base for a competitive future. Continued coordination, innovation, and investment by a range of private and public sector stakeholders—including incumbent and early-stage firms, the wider business community, state and local government, nonprofit intermediaries, universities, and workforce training programs—will be critical to position the state as a fintech leader in the coming years.

Introduction

Nearly forty years ago, the landmark Financial Center Development Act helped establish Delaware as a global hub for financial services. Further modernization of financial services regulations in subsequent years cemented the state's reputation as a destination for financial activities, with preeminent financial institutions quickly establishing credit card, consumer lending, and back-office operations in Delaware.

In the process, thousands of new jobs were created in the state, sowing the seeds for the deep and talented financial services workforce that developed over the next several decades.

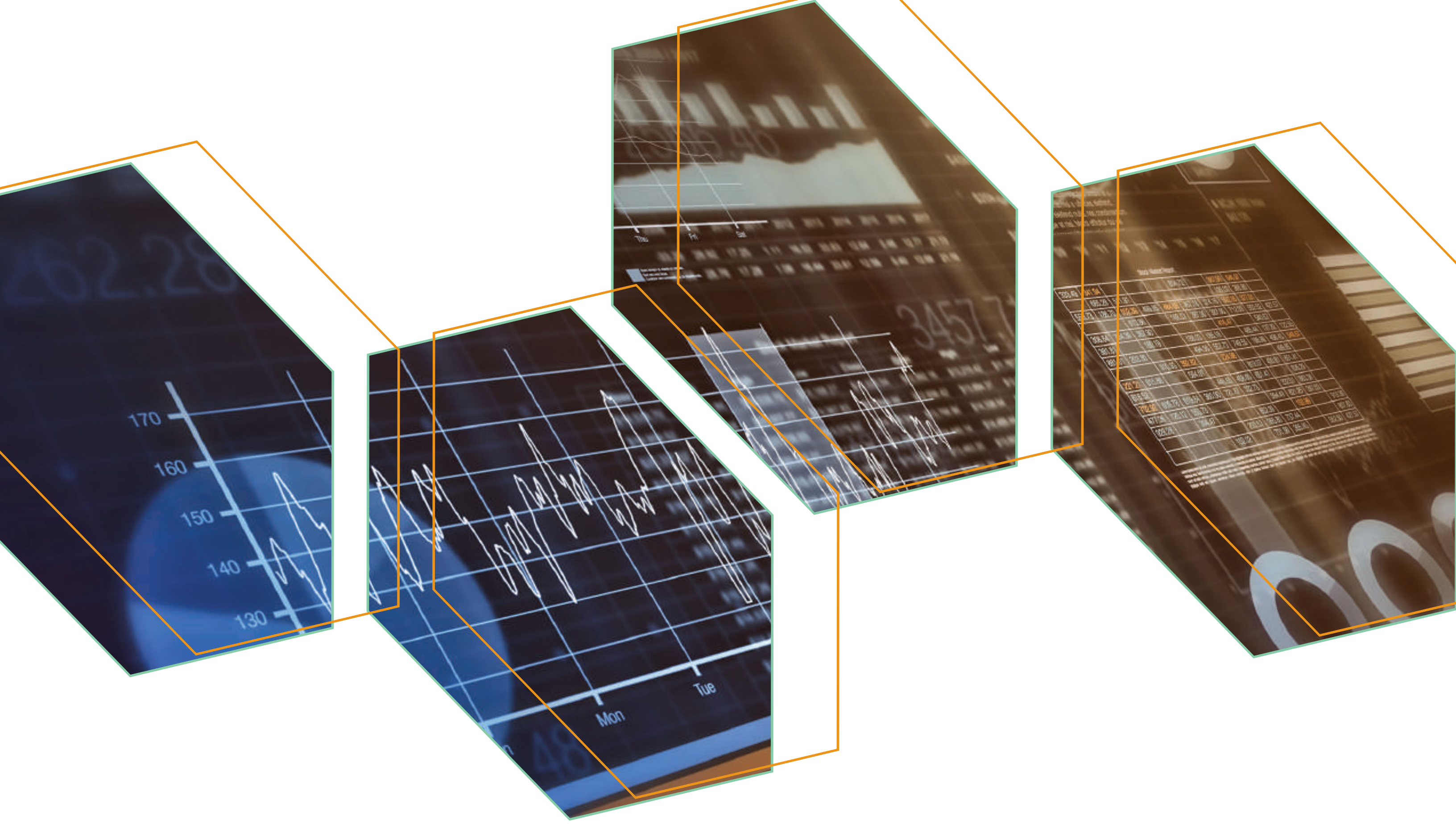
Today, Delaware stands at another inflection point, as rapid technological innovation has transformed the financial services ecosystem. Empowered by mobile advances and adoption, companies and entrepreneurs are using technology to deliver better, cheaper, and more efficient financial services to consumers. These advances in financial technology, or fintech, encompass a wide range of applications, from lending and transactions to the rapidly evolving cryptocurrency space. New startup companies creating and delivering these technologies now dot the financial services landscape. Established financial services firms have also transformed to include these platforms and are investing heavily in new technology and evolving talent needs.

Delaware's unique financial services infrastructure has already encouraged both established and early-stage firms at the vanguard of this technological transformation, including JPMorgan Chase, Marlette Funding, Fair Square Financial, and College Ave Student Loans, to grow their operations in Delaware. The state is rich with financial services, technical, and legal talent—the building blocks of all successful fintech enterprises. And with a quickly changing regulatory landscape, Delaware's small size and nimble political and regulatory structures offers unique advantages for companies looking to develop novel financial solutions.

Still, this transformation of the financial services industry is in its infancy. A shared understanding of the current landscape and of the transformation underway—among business leaders, policymakers, educators, and a wide range of stakeholders throughout the state—as well as broader opportunities and challenges, will be critical in positioning Delaware for sustained financial services growth in the decades ahead.

This report, a joint effort between the Delaware Prosperity Partnership, the First State Fintech Lab, and the University of Delaware's Institute for Public Administration, aims to contribute to this shared understanding and provide a foundation for ongoing conversations about Delaware's fintech opportunities.

Chapter 1 begins with a definitional framework for fintech and an overview of the fintech ecosystem in Delaware. Chapter 2 looks at broad investment activity and innovation trends in fintech, followed by an analysis of regional employment concentrations and firm-level trends in Chapter 3. Chapter 4 assesses the evolving nature of skills needed in the financial services industry and examines alignment between talent supply and demand in Delaware. Recognizing that there is much to learn from other regions, Chapter 5 highlights several examples of regulatory innovations and public-private investments that could serve as inspiration in Delaware. Finally, Chapter 6 puts forward some key considerations and opportunities for Delaware as the financial services industry continues to transform in the years ahead.



1. Background

As business leaders and policymakers assess how to catalyze growth in the emerging fintech space, common language about what fintech includes is critical. Is fintech a standalone industry, comprised solely of startups and early-stage firms? Or is it broader, encompassing a wide range of activities in firms of all shapes and sizes?

In Delaware, with such a significant presence of established financial services, understanding the existing ecosystem, and the interplay among different types of firms and the range of local fintech assets, will be equally important in identifying opportunities to position Delaware as a fintech leader.[1]

Defining Fintech

Fintech, according to a touchstone 2018 report from the U.S. Government Accountability Office (GAO), is "the use of technology and innovation to provide financial products and services." The Federal Reserve defines fintech as: "companies that use technology to make financial systems and the delivery of financial services more efficient." Fintech firms are using technology to develop solutions across a wide range of existing financial activities, including payments, lending, wealth management, and financial advice. Newer technology, such as distributed ledgers (blockchains being the most well-known example), are being used and tested in order to lower costs, increase convenience and speed, provide greater security, and boost financial inclusion.[2]

Digging deeper into these definitions raises a key question about whether the term "fintech" applies only to standalone, early-stage companies or also applies to traditional, incumbent financial services firms. When the term "fintech" first appeared during the past decade, it typically signified the former: firms that were innovating outside of the traditional financial services landscape. Even the recent GAO report, after providing a broad definition for fintech, focuses the bulk of its attention on "nontraditional technology-enabled providers, such as start-ups or more established technology firms, such as Apple or Google, that are offering traditional financial products or services to consumers."

Such nontraditional companies, as will be discussed here later, have attracted significant venture capital and have been a driving force in developing the financial technology that consumers rely on in 2019. In recent years, however, the relationship between these companies and incumbent financial services firms has become more complex. Incumbent financial services firms are increasingly embracing fintech to meet their customers' needs. Incumbents achieve this by launching their own fintech platforms, but also by originating loans for standalone firms; engaging standalone firms through private label arrangements to utilize their technology; establishing fintech incubators; or simply by investing in or acquiring standalone fintech companies. Acquiring companies that have already developed product and market fit, and which have mitigated risk for the new technology, is appealing to banks that do not have the same ability or desire to shoulder such innovation risks.

This embrace of fintech by incumbent financial services firms, according to a 2018 KPMG report, is not just confined to the largest banks, but is growing among mid-tier banks and smaller insurance and wealth management providers, many of which are also beginning to invest in accelerators and incubators.[3] A 2017 PwC survey found that 82 percent of surveyed financial services incumbents expected to grow their partnerships with standalone fintech companies in the coming three to five years.[4] The survey also highlighted that many early-stage firms have begun to transition from direct competition with incumbents to business-to-business collaboration with incumbents. The changing nature of these relationships, while certainly not applicable to all firms, was aptly summarized in a recent report from LinkedIn:

> Most successful fintech firms have focused on narrow functions or segments with high friction levels or those underserved by traditional financial institutions, but have struggled to profitably scale on their own. Traditional financial institutions have a vast customer base and deep pockets, but with legacy systems holding them back, many are increasingly open to innovation through collaboration and APIs rather than building on their own.[5]

Finally, it is notable that from a workforce perspective, traditional financial services firms have largely transformed into tech companies. In 2017, Goldman Sachs CEO Lloyd Blankfein noted, "Thirty percent of the people who work in this firm are engineers, are technologists, because of the way the financial markets have gone. So we compete against Facebook and Google and all these other places for talent." One analysis found that 46 percent of all job postings from Goldman Sachs in 2017 were for tech jobs, particularly mobile software developers.[6]

This report will look at fintech as "the use of technology and innovation to provide financial products and services," whether it is occurring at a standalone, early-stage company or a traditional, incumbent financial services firm. For issues ranging from investment activity to employment trends, the focus may differ by firm size and stage; however, taking stock of the broad landscape will help stakeholders understand and capitalize on the increasing confluence of financial services and technology.

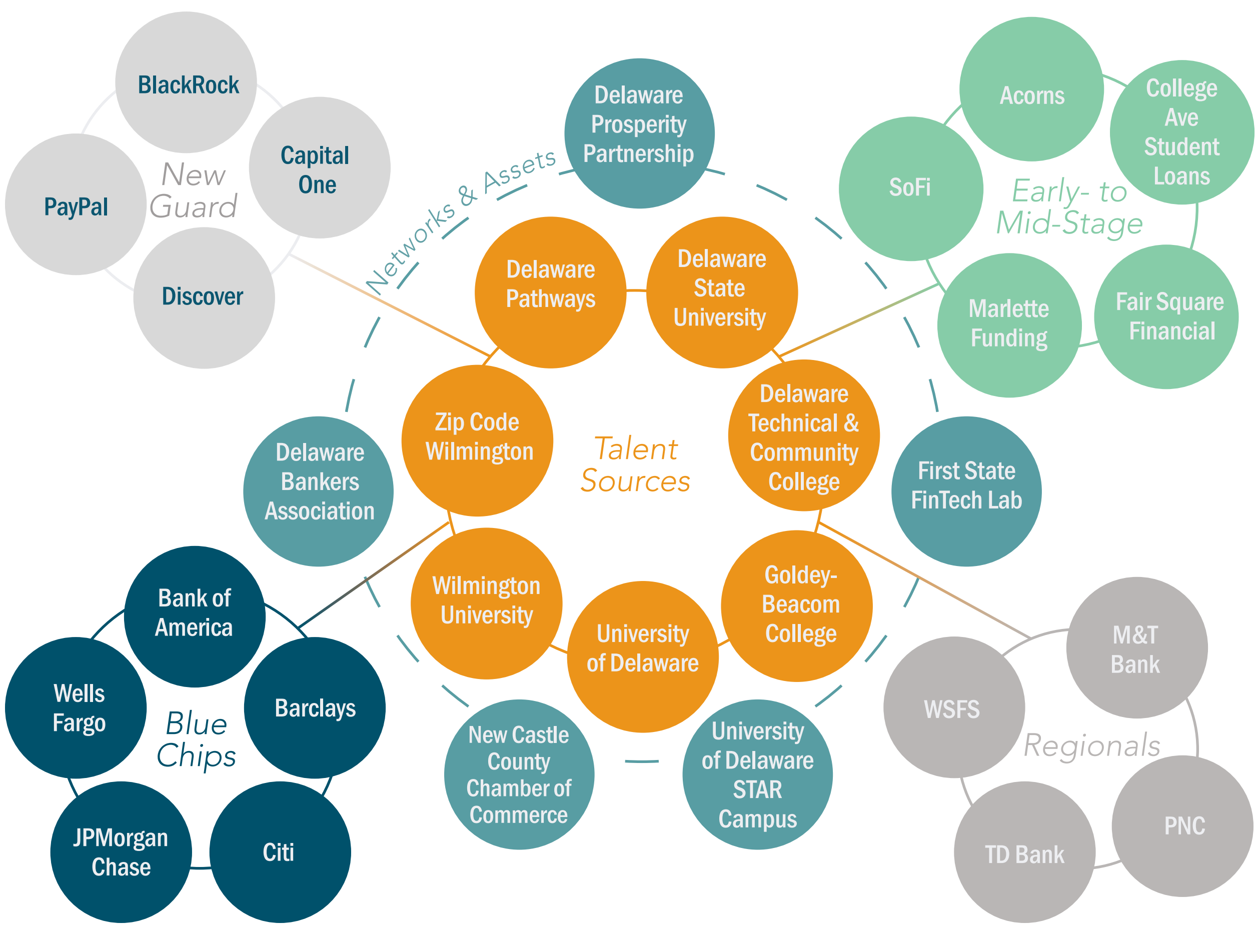
Delaware's Fintech Ecosystem

Delaware is home to nearly 48,000 jobs in the broad financial activities sector, with about 37,000 jobs in core financial services industries. Established firms like JPMorgan Chase have expanded their footprint significantly in recent years, adding thousands of new jobs in the state and opening the new Delaware Technology Center in 2015.[7] PayPal entered the market in 2017 with the acquisition of Swift Financial, an Inc. 5000 company, while San Francisco-based SoFi entered the market in 2017 through its acquisition of Claymont-based Zenbanx and plans to add hundreds of new jobs in Delaware.[8]

Homegrown companies like Fair Square Financial, Marlette Funding, and College Ave Student Loans have attracted tens of millions of dollars in venture capital and are creating hundreds of local jobs. And in early 2019, the Los Angeles-based company Acorns announced it would open its first east-coast office in Delaware, with thirty to fifty employees in Wilmington, while M&T Bank announced it would add hundreds of new tech jobs in the state in the next five years, as midsize banks increasingly shift from outsourcing their tech needs to building this capacity in-house.[9] Companies of all sizes are drawn by Delaware's high workforce concentration in credit marketing and analytics, with companies like Citi, Wells Fargo, TD Bank, and PNC establishing operations in Wilmington in the past few years to capitalize on this unique strength. This depth of opportunity is a critical advantage for Delaware in attracting and retaining top financial services and technology talent. And the diverse mix of incumbent and early-stage firms are buoyed by sources of new financial services and technology talent, as well as engaged business networks and institutions that provide critical connective tissue for a healthy fintech ecosystem (Figure 1). Employers can draw from a range of programs at the University of Delaware, from computer and information science in the College of Engineering to accounting, economics, finance, and entrepreneurship and technology innovation in the Alfred Lerner College of Business and Economics, as well as emerging initiatives at STAR Campus. Delaware Technical Community College and Delaware State University are critical pieces of the talent pipeline, while innovative programs like Zip Code Wilmington successfully prepare students for software development jobs in Delaware's financial services industry. Fintech is a key industry focus for the Delaware Prosperity Partnership as it works to attract new businesses to the state, help existing companies grow, and nurture the state's entrepreneurial environment. The First State Fintech Lab and the New Castle County Chamber of Commerce recently announced the formation of the Greater Delaware Fintech Network, which will work with a variety of stakeholders around educational, regulatory, and other community-focused initiatives.

The First State already has a well-developed financial services environment and has many of the building blocks in place for future fintech growth. Still, ample opportunity exists to further develop the state's infrastructure to capitalize on the surge in investment and innovation in fintech across the United States and globally in recent years.

Figure 1. Delaware's Fintech Ecosystem at a Glance



Note: This illustration is a representative sample and not an exhaustive accounting of all firms in the system.

2. Investment and Innovation

Global investment activity in fintech-related companies has soared in recent years. Several Delaware firms have attracted investment, and the presence of so many established financial services firms positions the state well to capture accelerating investment by corporate venture arms. Still, as is the case outside the major global gateway markets, Delaware faces visibility challenges in attracting greater venture capital.

The surge in investment activity comes as innovation in fintech has flourished, with a constant influx of new applications and accelerating patenting activity. From an intellectual property perspective, Delaware seems competitively positioned as a home to current research and development and job centers in the financial services industry. If current patenting activity is a rough leading indicator of the companies, products, and locations that play a significant role in future fintech employment and innovation, then Delaware's fintech future is bright.

Investment Volume and Deals

In 2013, global fintech investment—including mergers and acquisitions, venture capital, and private equity—totaled $18.9 billion, spread across more than 1,100 deals. Just five years later, 2018 fintech investment totaled $111.8 billion, across nearly 2,200 deals (Figures 2 and 3).[10] More than 60 percent of this investment volume was driven by mergers and acquisitions, reflecting increased consolidation and an accelerating pace of early-stage companies being acquired by larger financial services and technology firms. Still, venture capital into early-stage fintech companies accounted for $35.4 billion in 2018, representing nearly one-third of total global fintech investment.

Figure 2. Total Global Investment Volume, Fintech

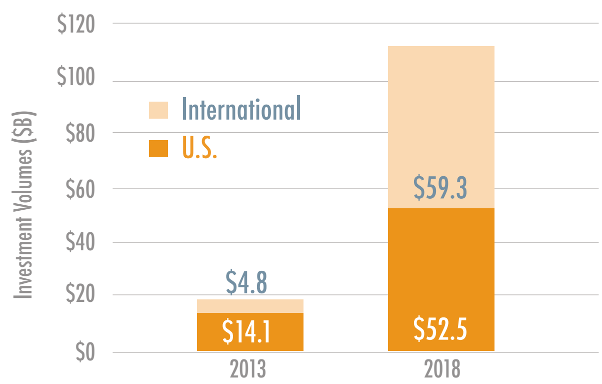
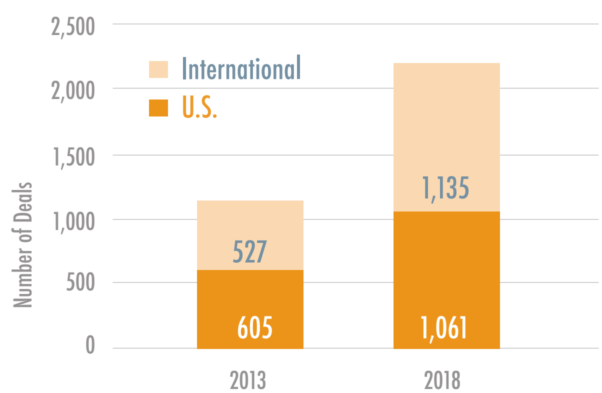


Figure 3. Total Global Investment Deals, Fintech



Source: KPMG, "The Pulse of Fintech 2018," PitchBook.

Note: Total investment figures includes mergers and acquisitions, venture capital, and private equity.

The United States captures a significant share of global fintech investment. Of the $111.8 billion in total global investment, $52.5 billion was invested in U.S. firms, which includes $11.4 billion in venture capital investment alone, up from $2.3 billion in 2013. Fintech-related venture capital activity in the United States has been heavily concentrated in two regions—the San Francisco Bay Area and metro New York City. According to data from the most recent PwC MoneyTree report, between 2016 and 2018, the Bay Area and New York City metro accounted for 40 percent ($5 billion) and 21 percent ($2.5 billion), respectively, of total venture-backed investments in U.S.-based fintech companies.[11]

Reported aggregate investment volume for a small state like Delaware is not as reliable, but the data available does indicate that Delaware accounts for an outsized share of fintech investment in the Philadelphia metro area. According to PwC Moneytree, Delaware firms attracted $50.3 million in venture capital funding during the past two years, about 75 percent of all venture capital investment in the Philadelphia region. But, as evidenced by the aggregate volume for Delaware, these data are likely not capturing significant equity investments in Delaware fintech firms. Fair Square Financial received a $200 million equity investment in 2016, followed by another $100 million equity investment in 2018.[12] Similarly, Marlette Funding raised $75 million in 2015, while College Ave Student Loans has raised at least $60 million between 2014 and 2017.[13]

Distribution of Venture Capital Firms

Delaware, like most regions outside of Silicon Valley and New York, faces a foundational challenge in attracting venture capital at scale: a dearth of locally-based venture capital firms. While distance has largely diminished as a barrier to many economic activities in recent decades, physical proximity between venture capital firms

With nearly twenty-one patents assigned per 100,000 population, Delaware ranks first in per capita fintech patents—outpacing South Dakota and Connecticut, which were assigned just over four patents per 100,000 population.

and the companies they invest in often still matters. And even for companies that are able to attract cross-region investment, there are often implicit or explicit expectations for the company to eventually move where the investment firm is located.

In an analysis of 70 independent fintech-related venture capital firms based in the United States, none had Delaware as their primary place of business or even maintained offices in Delaware.[14] Furthermore, outside of New York, only a small number of fintech-focused venture capital firms operate in the Mid-Atlantic. And while venture capital firms elsewhere often maintain a joint focus on both financial and technology applications, the venture capital firms surrounding Delaware tend to focus on several financial core competencies, such as e-commerce, asset management, consumer finance, and business services.

Still, independent venture capital firms are not the only sources of capital for growing fintech firms. In fact, corporate venture arms, including from the many established financial services firms that call Delaware home, accounted for $4.4 billion in fintech investment in the United States in 2018. This level of investment represents about 40 percent of the $11.4 billion in U.S. fintech-related venture capital investment in 2018.[15] With the widespread presence of major financial services firms in Delaware, rising investment by corporate venture arms represents a significant opportunity for local, growing companies to gain visibility and secure capital.

Early-stage companies like Marlette Funding, College Ave Student Loans, Swift Financial (now PayPal), and Fair Square Financial have been able to attract significant venture capital to-date, even with limitations in the local venture capital market. Developing a more robust local capital ecosystem, however—from private venture capital, to corporate venture arms, to a deeper angel investor community—could bolster Delaware's position to capitalize on future fintech growth.

Patenting Activity

Beyond investment activity, the geographic distribution of innovation in fintech is another element in assessing regional competitiveness and the opportunity to capture future fintech growth. Relecura, an intellectual property analytics firm, has published multiple reports on fintech patenting activity that speak to Delaware's competitive position.[16] Bank of America, Capital One, and JPMorgan Chase have significant footprints in Delaware, and the Relecura analysis ranks these companies among the top ten international holders of patents in several financial categories. In 2015, Bank of America ranked third internationally for patents held in lending, fourth for banking patents, fifth for wealth management patents, sixth for payment patents, and tied for tenth for insurance patents. Capital One ranked ninth in lending patents held, while JPMorgan Chase ranked third for wealth management patents, fourth for lending patents, fifth for capital market patents, and eighth for banking patents. From the technological perspective, Relecura cited Bank of America as a key patent holder on the topics of Internet of Things (IoT), mobile platforms, security, and cryptocurrency, while both JPMorgan Chase and Bank of America are among the top patent acquirers and holders of high-quality patents across multiple financial categories.

A state-level analysis of financial services-related patent activity sheds further positive light on Delaware's fintech future.[17] Using the same categories of patents considered to be "fintech" as the Relecura studies, 199 fintech patents were assigned to Delaware-based individuals and companies during the 2009–2018 period.[18]

Such an analysis places Delaware fifth nationally, in terms of the absolute number of fintech patents assigned during this period. With nearly twenty-one patents assigned per 100,000 population, Delaware ranks first in per capita fintech patents—outpacing South Dakota and Connecticut, which were assigned just over four patents per 100,000 population (Figure 4).[19] Delaware also ranks first when fintech patents are considered as a measure of the productivity of financial services employment. Delaware boasts nearly eleven fintech patents assigned per 1,000 jobs in the financial services cluster, with the next closest state, Ohio, assigned just over six patents per 1,000 jobs during the 2009–2018 period.[20]

Figure 4. Top 15 States for Fintech Patents Assigned Per Capita, 2009–2018

State	Patents assigned per 100,000 population	Patents assigned	Percent of total patents assigned	Patents assigned per 1,000 financial services employees
Delaware	**20.6**	**199**	**5.4**	**11.0**
South Dakota	4.2	37	1.0	4.7
Connecticut	4.0	144	3.9	3.0
Ohio	3.0	352	9.6	6.1
California	2.2	872	23.8	3.9
New York	2.1	420	11.5	1.7
Illinois	2.1	265	7.2	2.7
Colorado	2.1	118	3.2	2.9
Washington	1.9	140	3.8	5.0
Massachusetts	1.6	113	3.1	1.5
Nevada	1.3	38	1.0	3.1
Kansas	1.2	34	0.9	2.4
New Jersey	1.1	100	2.7	1.3
Minnesota	0.8	46	1.3	1.1
Georgia	0.8	83	2.3	1.6

Source: U.S. Patent and Trade Office, U.S. Census Bureau, U.S. Cluster Mapping Project, University of Delaware Institute for Public Administration analysis.

Note: "Patents assigned" refers to the state of domicile of the individual or company receiving the patent.

Patenting activity at Delaware-based companies does not necessarily mean that all of the related innovations are occurring in Delaware. In absolute terms, Delaware-based inventors were responsible for forty-five fintech patents between 2009 and November 2018, ranking nineteenth among the fifty states.[21] Still, on a per capita basis, Delaware ranked second behind Connecticut with nearly two and a half fintech patents invented per 100,000 people (Figure 5). Delaware's standing on the location of fintech invention activity is still highly competitive. However, the discrepancy between inventor and assignee locations suggests that much of Delaware's fintech innovation strength comes from the location of innovative firms, and not necessarily from the concentration of fintech inventors in Delaware.

While the high level of innovation from Delaware-based companies is an asset for the state going forward, companies' decisions about where to translate that innovation into new jobs and investment will ultimately depend upon identifying innovative business environments where they can access top talent.

Figure 5. Top 15 States for Fintech Patents Invented Per Capita, 2009–2018

State	Patents invented per 100,000 population	Patents invented	Percent of total patents invented	Patents invented per 1,000 financial services employees
Connecticut	5.0	178	3.9	3.7
Delaware	**4.7**	**45**	**1.0**	**2.5**
Colorado	3.5	202	4.5	5.0
Illinois	3.1	395	8.8	4.0
California	3.0	1,195	26.5	5.4
New Jersey	3.0	268	5.9	3.6
Washington	2.7	207	4.6	7.4
Massachusetts	2.4	168	3.7	2.2
Arizona	1.9	133	3.0	2.8
Georgia	1.7	177	3.9	3.4
Utah	1.7	53	1.2	1.7
Texas	1.4	394	8.7	2.1
Nebraska	1.3	25	0.6	1.3
New York	1.0	201	4.5	0.8
South Dakota	1.0	9	0.2	1.1

Source: U.S. Patent and Trade Office, U.S. Census Bureau, U.S. Cluster Mapping Project, University of Delaware Institute for Public Administration analysis.

Note: "Patents invented" refers to the state where the actual patent inventor is located.

3. Employment and Firm Trends

As new firms launch and existing businesses grow, one of the primary site selection considerations is the local talent pool. Some of this talent pool consists of students coming out of college or workforce training programs—important talent assets that will be discussed in the next chapter. However, high concentrations of existing workers in a given field are critical in attracting and retaining new businesses.

Fintech firms of all ages and sizes require a wide range of employees across functions. Understanding regional employment concentrations for the two building blocks of the fintech workforce, financial services and information technology, is critical in assessing a region's ability to capture future growth in this cluster.

Financial Services Employment Hubs

It is no surprise that the largest financial services workforces, in absolute terms, are in our largest state economies: California, Texas, New York, Florida, and Illinois. These states are hubs for financial services, and large talent pools in any industry draw the attention of firms as they look to launch or grow. Many of these large markets also have higher costs of doing business and come with significant competition for talent among employers, which can dampen the benefit of having such a deep talent pool. In New York, average wages in the financial services industry are 65 percent higher than the national average; in California, there is a 16 percent premium and in Illinois an 11 percent premium. Texas and Florida are more affordable than the national average.

Assessing the concentration of financial services employment through location quotients, as opposed to only through absolute job levels, provides a better sense of how states compare when taking states' sizes into account. By this metric, Delaware has the highest concentration of financial services jobs in the nation. The financial services sector accounts for 9 percent of all jobs in Delaware, a figure nearly twice the U.S. average (reflected by a location quotient of 1.90).[22] In comparison, Arizona and New York, with the second- and third-highest concentrations of financial services jobs in the U.S., exceed the U.S. average by about one-third (with location quotients of 1.37 and 1.35, respectively) (Figure 6).

Using the same metric to compare U.S. counties, Hudson County, New Jersey (Jersey City) and New York County, New York (Manhattan) have the highest concentrations of financial services jobs, followed closely by New Castle County, Delaware (Wilmington).[23] New Castle County has a higher concentration of financial services jobs than other established finance centers, like Suffolk County, Massachusetts (Boston) in the Northeast, or even booming finance hubs in the South like Mecklenburg County, North Carolina (Charlotte) and Collin County, Texas (Dallas/Plano/Irving).

Furthermore, Delaware is buoyed by its presence within the Philadelphia metro area, which has the fifth-most financial services jobs across U.S. metro areas, with nearly 170,000 finance jobs.[24] As a result, Delaware companies benefit from the high density of financial services jobs within its borders, as well as the broad access to talent afforded by being part of one of the nation's largest metro areas.

Tech Employment Hubs

Regional concentrations of financial services employment are only one part of the fintech talent equation, and it is equally important to understand regional concentrations of tech employment. Tech workers can be found in all industries, and while technologists can specialize in software development, cybersecurity, or network administration, their skills are often transferable across industries. This means that financial services firms looking to fill tech positions are drawing from roughly the same talent pool as dedicated tech firms, healthcare employers, and a wide range of firms throughout the economy.

In the United States, the five states (or equivalents) with the highest concentration of tech workers are not surprising: Washington, D.C., Virginia, Washington state, Maryland, and Colorado. Massachusetts ranks sixth and California ranks eighth. Delaware comes in at an impressive number seven. Delaware has a concentration of tech workers about one-third higher than the national average.[25]

In absolute terms, due to its small size, the tech talent pool within Delaware's borders is smaller than these other states. But again, employers in northern Delaware are positioned within the Philadelphia metro area, with more than 100,000 workers across tech occupations.[26]

Figure 6. Top 15 States for Financial Services Employment Concentration, 2018

State	Financial Activities Employment Concentration (Location Quotient)	Number of Financial Activities Jobs	Financial Activities Average Annual Wage	Financial Activities Wage Premium/ Discount to U.S.
Delaware	**1.9**	**47,787**	**$82,004**	**-1%**
Arizona	1.37	212,340	$66,820	-19%
New York	1.35	711,808	$136,240	65%
Connecticut	1.32	123,895	$124,020	50%
Iowa	1.24	109,064	$69,004	-16%
Nebraska	1.2	66,259	$62,244	-25%
Florida	1.19	568,865	$68,640	-17%
Rhode Island	1.18	32,319	$79,040	-4%
South Dakota	1.18	28,824	$55,744	-33%
Illinois	1.11	373,935	$91,988	11%
Minnesota	1.1	177,992	$83,616	1%
Colorado	1.1	164,288	$75,816	-8%
Texas	1.1	752,024	$75,608	-8%
Massachusetts	1.08	217,001	$112,216	36%
New Jersey	1.06	242,918	$98,956	20%
United States	**1**	**8,168,400**	**$82,628**	**N/A**

Source: U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages, DPP analysis

Note: Data as of 2018. Location quotients (LQ) measure how concentrated a sector is in a local economy versus the national economy and are a tool to identify unique characteristics of local economies. Delaware's LQ of 1.9 means that in Delaware, the ratio of financial services employment to total employment is 1.9 times higher than the nation as a whole.

Consolidation in the Financial Services Industry

In assessing regional fintech workforce concentration it is important to consider the broader landscape of firms in which this workforce is employed. Even with the surge in investment activity and financial services technological innovation in recent years, the financial services industry, on net, continues to consolidate. In the United States in 2017, the largest financial services firms (250+ employees) accounted for 73 percent of all financial services employment, up from 69 percent in 2007 (Figure 7).[27] The same trend holds true when analyzing employment by firm age. In the United States in 2017, financial services firms in existence for more than 10 years accounted for 90 percent of financial services employment, up from 86 percent in 2007 (Figure 8). These figures stand in contrast to the overall U.S. economy, where the largest firms account for just 50 percent of total employment, and where firms in existence for more than 10 years accounted for 80 percent of national employment in 2017.

In Delaware, consolidation in financial services is even more stark. Financial services firms with at least 250 employees accounted for 91 percent of statewide financial services employment in 2017, up from 88 percent in 2007. And financial services firms in existence for more than 10 years accounted for 93 percent of financial services employment, up from 88 percent in 2007.

These large, established firms are critical to Delaware's fintech future. But continued diversification of the local financial services industry, including more early-stage, fast-growth companies to complement the base of incumbent firms, will ultimately create an even more vibrant fintech ecosystem in the state. One area that is vital to the success of incumbent and early-stage firms alike is a robust pipeline of new talent to ensure that companies' growth demands can be met within the state.

Figure 7. Share of Financial Services Employment at Large Firms (250+ Employees)

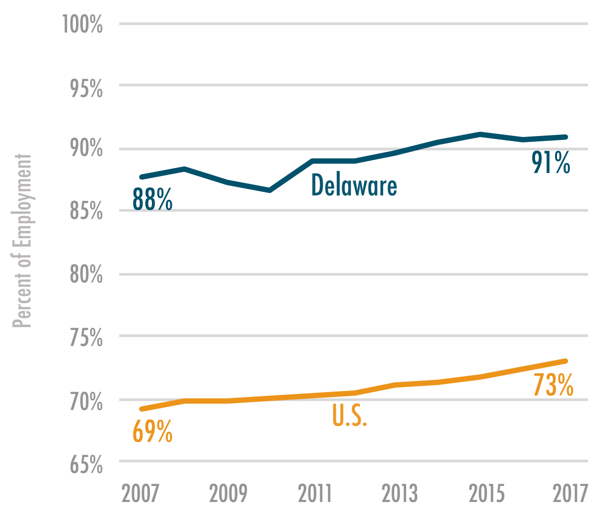
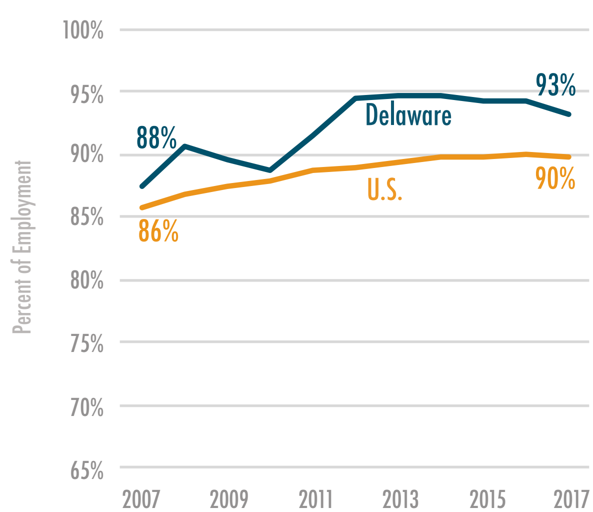


Figure 8. Share of Financial Services Employment at Longest-Tenured Firms (11+ Years)



Source: U.S. Census Bureau Longitudinal Employer-Household Dynamics. Analysis by Delaware Prosperity Partnership.

Note: Latest data as of 2017

4. Talent Supply and Demand

The continued tightening of the labor market, with national unemployment rates reaching fifty-year lows, and evolving skill and credential requirements, is creating significant hiring challenges for employers across the United States.

The talent crunch is particularly acute for tech jobs, as firms across industries compete over the same individuals graduating from computer science programs and other nontraditional training programs nationwide, while educational institutions scramble to meet rapidly changing employer needs.

Financial services firms—incumbents and startups alike—face these challenges as their needs for tech talent accelerate. Many of the new jobs that financial services firms create are in software development, cybersecurity, network administration, and a range of other tech-specific fields, not to mention the growing need for technological know-how across all occupations. These demand trends are not only anecdotal, but are apparent in analysis of federal employment data and real-time job posting data for Delaware firms. Delaware has a range of educational and training institutions helping to meet these new tech talent needs, with opportunities to build an even more robust tech talent pipeline into the future.

Financial Services Talent Needs

Analysis of federal occupational employment data illustrates the transformation in the skills and knowledge needed for financial services jobs in the United States.[28] So-called "bright-outlook" occupations in the financial services industry (occupations projected by the U.S. Bureau of Labor Statistics to experience at least 10 percent employment growth or 100,000 job openings nationally over the 2016–2026 period) reveal an industry that increasingly prizes technology skills and abilities.[29] Bright-outlook finance jobs include software developers, information security analysts, and financial quantitative analysts, all occupations that demand more advanced technological skills than do occupations projected to decline over time, including tellers, bill collectors, and data entry persons.[30]

Across projected high- and low-growth finance occupations, employers require baseline skills and abilities like writing, active listening, critical thinking, and customer service skills, as well as basic data entry capabilities through software like Microsoft Access. As projected occupational growth rates increase, however, so too do the demands not just for greater analytical and computational skills, but also for specific technological skills. Average or above-average growth rate occupations, like computer systems analysts, frequently must possess object- or component-oriented software development skills (e.g., Python, C++, Java). Positions in the bright-outlook group, such as financial specialists and examiners, often require additional specialized expertise in financial analysis and other analysis software.

Occupations with lower technology skill requirements will still exist in the financial services industry, but most are expected to experience much slower growth than their more technology-intensive counterparts. If these projections hold, then jobseekers with intensive technological abilities will find themselves increasingly in demand by financial services employers.

Real-Time Job Posting Trends in Delaware

Beyond the official employment statistics, real-time job posting data can provide further insight into on-the-ground hiring needs of local employers. Rather than only capturing new jobs, job posting data provide an estimate of the number of total job openings—whether those are entirely new jobs or openings due to worker turnover or retirement—and utilize algorithms to de-duplicate postings from online job boards.

Delaware Pathways

In 2014, Delaware joined the Pathways to Prosperity Network to strengthen the state's talent pipeline. The Pathways program provides high school students with an opportunity to earn early college credits, work toward targeted industry certifications, and gain meaningful work experience. The Pathways program has grown significantly since its inception, from thirty students in 2014 to 9,000 students in 2018. The state's goal is to reach approximately 20,000 students (50 percent of the high school population) for the 2019–2020 school year.

The program's partners, including high schools, postsecondary education institutions, employers, local nonprofits, and several state agencies, identified information technology as a high-demand sector and created a computer science pathway in 2015, followed by a CISCO networking pathway in 2016. In 2018, Pathways received a $3.25 million Bloomberg grant to increase the program's student participation, support a partnership with Zip Code Wilmington, and launch summer learning opportunities in coding and computer science. For the 2019–2020 school year, the computer science pathway will be offered at twenty-two high schools across the state, and the CISCO networking program is available at many Delaware vocational-technical schools.

Because of the volume of these data, analysis was performed on the twenty financial services firms with the greatest number of postings in Delaware in 2018.[31] These twenty firms accounted for nearly 13,000 job openings in 2018, led by large incumbent firms like JPMorgan Chase, Bank of America, and M&T Bank, but also included standalone fintech companies like Marlette Funding and SoFi. Job openings at these twenty firms accounted for 8 percent of all job postings in Delaware in 2018.

One of the most striking trends in job postings at these financial services firms, though, was the significant demand for tech workers. Tech occupations, primarily software developers, but also computer systems engineers, information security analysts, and more, accounted for 19 percent of the job openings in these twenty financial services firms in 2018, equating to approximately 2,500 openings. And the demand at several large companies was significantly higher. At Capital One, tech jobs accounted for 43 percent of job postings, while at TD the figure was 29 percent, and 26 percent at JPMorgan Chase.

Delaware's Tech Talent Pipeline

Much of the demand for these openings is met by the existing labor force, as workers are promoted from within or move laterally between firms. However, new tech talent is always needed, whether it is to backfill some of those vacated positions or to fill net new jobs. Some of this new talent can be drawn from other regions, but a national shortage of tech talent means that Delaware financial services firms are competing for top talent with firms in tech and non-tech industries across the country. Continuing to build a robust pipeline of tech talent at institutions within Delaware and the broader region will be critical in meeting local employer demand.

Delaware is home to a wide range of tech education and training programs, from K–12 programs like Delaware Pathways (see sidebar) to a range of postsecondary programs. These include innovative short-term programs like Zip Code Wilmington, associate degree programs at Delaware Technical Community College (Delaware Tech), and bachelor's degree and advanced degree programs at the University of Delaware (UD), Delaware State University (DSU), Goldey-Beacom College, and Wilmington University. Many of these programs have been growing in recent years as demand from local and national employers surges. The number of graduates across tech-related programs at UD has increased by approximately 30 percent since 2015, while Zip Code Wilmington nearly doubled its cohort size between December 2015 and July 2018.[32]

UD graduated eighty-seven students from its computer science bachelor's programs in 2018, with about another forty graduating with related bachelor's degrees and about 120 advanced degrees.[33] Zip Code Wilmington had eighty-one graduates between April 2017 and April 2018, while Delaware Tech granted about eighty associate degrees across several tech fields.[34] DSU produced twelve computer science and information technology graduates in 2018, and while Wilmington University's figures are impressive, with about 170 bachelor's degrees across tech fields and about 1,000 advanced degrees, the majority of these students completed coursework online and are not necessarily part of the local talent pipeline.[35]

Local institutions and programs are working to grow their offerings. One promising area on the degree side is growth in computer science minors, with more than 130 UD students enrolled in the minor program in 2017–2018.[36] The model of pairing computer science with another discipline—often referred to as CS+X—recognizes that many employers are not necessarily looking for employees who are full-stack developers, but who have a core set of hard skills paired with the business skills that other disciplines can provide. Growth in non-credit offerings, perhaps similar to Zip Code Wilmington, where individuals can obtain discrete training and credentials, is another area of promise and one for which institutions are engaging with employers and a range of stakeholders to chart a path forward.

There are no easy solutions to quickly grow the tech talent pipeline. Educational institutions can require long lead times to implement or alter curricula, raise resources and hire faculty for degree programs. However, these institutions are increasingly looking to diversify the types of programs they offer, particularly noncredit programs that can be developed more quickly and with greater flexibility. Rather than create each new program from scratch, opportunities exist to replicate models in the state, like Zip Code Wilmington, that have already proven effective at meeting employer needs and delivering value for students. Zip Code is already building on its successful model, introducing new programs that meet local employer needs in data science and a "tech for non-techies" option for those who work in non-technical roles.

Regular, structured communication between employers and educational providers about the specific skills and competencies that employers require is critical. At the same time, it is vital for employers to guard against over-credentialing on job postings that might screen out nontraditional candidates and to look at ways that their incumbent workers could help meet instructional needs as educational institutions face instructor shortfalls. Lastly, while efforts are underway on several fronts to grow the talent pipeline within the state, there may be opportunities to work with partner institutions throughout the region and build on promising models that are working outside of Delaware.

5. Learning from Other Regions

While Delaware has unique competitive advantages in financial services and the necessary building blocks to nurture growth among incumbent and startup firms, this growth is not guaranteed.

Other regions similarly have robust financial services and technology infrastructure, and over the past few years, public and private sector actors in those regions have implemented a wide range of innovative policy ideas and investments to encourage future financial services and technology growth.

Regulatory Innovation

As fintech solutions are being developed and adopted at a rapid rate, policymakers and global institutions are taking notice. The Bank for International Settlements (BIS), often called the 'central bank of central banks,' has noted:

> [We recognize] that the emergence of fintech is only the latest wave of innovation to affect the banking industry. Banks have undergone various technology-enabled innovation phases before. However, the rapid adoption of new technologies along with their effect in lowering barriers to entry in the financial services market has fostered the emergence of new business models and many new fintech entrants. These factors may prove to be more disruptive than previous changes in the banking industry, although as with any forecast, this is in no way certain.[37]

And Christine Lagarde, managing director of the International Monetary Fund, has been vocal about the changing nature of finance and the lessened reliance on physical cash, noting that "[i]n the world of Fintech, we need to harness change so it is fair, safe, efficient, and dynamic."

Governments recognize this disruption as an important inflection point and have taken steps to capitalize on the moment. According to a recent report from the FinTech Working Group of the United Nations and the University of Cambridge, more than forty nations have pursued initiatives to support financial services innovation.[38] These initiatives can take many forms, from creating new offices designed to interface with fintech companies, to direct national investments in companies. While there has been some movement toward implementing new initiatives in the United States, regulatory innovation has been more swift in countries such as the United Kingdom, Australia, and Singapore, particularly with the introduction of the "regulatory sandbox."

Regulatory Sandboxes

Designed to encourage investment and job creation—while simultaneously providing exposure and experience for regulators amidst rapidly evolving products in the marketplace—the regulatory sandbox concept has gained popularity in recent years.[39] While the model differs from nation to nation, the typical process follows a common framework. First, applicants are evaluated based on eligibility criteria, including whether the product constitutes a genuine innovation, offers a consumer benefit, and is ready for testing. Second, admitted companies work to craft appropriate testing protocols and consumer safeguards. Finally, at the end of the test period, participants either "graduate" to full licensing or are released from the sandbox without market access.

The United Kingdom's Financial Conduct Authority (FCA) was the first regulatory authority to establish a sandbox and is often referenced as the model for such initiatives. The sandbox, which operates in six-month rounds, is meant to allow the testing of new products in a live market environment, but with safeguards. In its first year, fifty applicants were accepted.

In a "Lessons Learned" report issued in late 2017, the FCA determined that it is too early to assess the impact of regulatory flexibility on the market and competition.[40] However, the report noted that the UK regulatory sandbox environment appears to facilitate bringing products to market, as well as access to capital investment. To date, three-quarters of companies in the first round have completed testing, and of those, 90 percent "have progressed towards a wider market launch." At least 40 percent of first-phase firms received investment either during or following their sandbox test.

Regulatory Initiatives in the United States

Unlike many other countries that have just one centralized financial regulator, regulatory authority is much more decentralized in the United States. A myriad of regulatory agencies operate at the federal level, not to mention banking, insurance, and securities regulators in each of the fifty states.[41]

In the absence of comprehensive federal action to date, innovation offices and initiatives have been established at a number of federal financial regulatory agencies, including the Office of the Comptroller of the Currency (OCC), Securities and Exchange Commission (SEC), Commodity Futures Trading Commission (CFTC), Consumer Financial Protection Bureau (CFPB), and others. The OCC has made the most aggressive proposal among federal agencies, which would offer fintech firms the opportunity to receive a national bank charter.[42] This "special purpose" national bank charter authority has been used before, such as the charter under which many credit card banks operate.

A so-called "fintech charter" would allow fintech firms engaged in non-depository activity to operate nationwide without engaging in the onerous fifty-state licensing process. That said, they would still have to fulfill many of the duties and responsibilities of a bank. Many firms are still considering the value of receiving such a charter when compared with the state-based alternative. Complicating matters, the Conference of State Bank Supervisors (CSBS), a group of the nation's state banking authorities, has sued the OCC on the grounds that the agency has overstepped its bounds.[43]

In July 2018, U.S. Department of the Treasury released a report detailing potential improvements to the American regulatory system to support fintech innovation.[44] As Treasury Secretary Steve Mnuchin said upon the report's release, "Creating a regulatory environment that supports responsible innovation is crucial for economic growth and success, particularly in the financial sector."

The report details more than 80 recommendations, including supporting a national data security and breach notification standard, encouraging regulators across the country to harmonize rules, facilitating service partnerships between banks and nonbank firms, and "working with federal and state regulators to establish a system similar to a 'regulatory sandbox' to invite innovations from new and existing market participants." Overall, Treasury stressed that systems needed to be improved

The Office of the Comptroller of the Currency has made the most aggressive proposal among federal agencies, which would offer fintech firms the opportunity to receive a national bank charter.

to allow regulators to better keep pace with the industries and markets they regulate.

Several federal regulators have begun to explore how to offer regulatory sandboxes or similar programs. In February 2019, the CFPB proposed updates to its No-Action Letter program that included a proposal for a "Product Sandbox," which allows for approval and exemptive relief from certain regulatory requirements. In April 2019, the OCC proposed an "Innovation Pilot Program" intended to provide a framework for banks to engage with the OCC on small-scale, short-term tests of innovative products where there is regulatory uncertainty. Congress, too, has begun discussing what more could be done to support fintech innovation in the United States, with the introduction of several bills and proposals to improve regulatory clarity.

While Congress and the executive branch assess options at the federal level, states are taking the lead in introducing innovative regulatory approaches. In 2018, Arizona became the first state to propose and pass into law a regulatory sandbox for fintech innovation, followed in 2019 by Wyoming and Utah. Other states are considering the same and a group of six New England states are actively discussing an opportunity to collaborate on an initiative of this sort. Several years earlier, Delaware made global news by being the first state to establish a comprehensive blockchain initiative in 2016, making changes to statutes and beginning pilot programs to test various applications of the technology. Similar efforts have subsequently been undertaken in other states, such as Wyoming and New Hampshire.

Moving Toward New Regulatory Frameworks

In the United States, state governments will play a unique role in shaping the future of fintech regulation. Responding to concerns regarding regulatory fragmentation, and in light of the OCC's proposed national fintech charter, the Conference of State Bank Supervisors (CSBS) launched Vision 2020, "an initiative to modernize state regulation of non-bank financial companies."[45] Vision 2020 aims to make the state licensing process easier by pursuing such initiatives as harmonizing state regulatory expectations and practices, and assisting states via improved technology and standards.

Despite the emergence of new regulatory approaches, though, there remains uncertainty over which approaches will best encourage sustained fintech growth. The aforementioned report from the FinTech Working Group of the United Nations and the University of Cambridge is cynical of sandboxes, believing "they are neither necessary nor sufficient for promoting financial inclusion," and while they do offer benefits, "they are complex to set up and costly to run." The report is more favorable toward "Innovation Offices," or single points of contact established by governments to facilitate and support fintech innovation, touting that "through direct engagement with regulators, innovators can gain an increased understanding of how the regulatory framework applies to their business."

Ultimately, there is no one-size-fits-all regulatory solution, and the regulatory initiatives that prove most useful will vary across jurisdictions. For Delaware, the right approach may lie in some combination of best practices from other regions and unique ideas borne from decades of leadership in the financial services industry.

Public, Private, and University Investments

Beyond the regulatory sphere, creative collaboration between the public sector, private sector, and regional universities will be critical in developing a flourishing fintech ecosystem going forward. In recent years, several unique investments and partnerships have emerged across the country to address broad tech talent gaps, as well as more targeted initiatives focused specifically on fintech.

A Transformative Partnership in Virginia

In 2017, Amazon announced a site selection search for its second headquarters and emphasized the need for tech talent. To meet Amazon's demands and spur tech talent development, the State of Virginia and Virginia Tech, with a range of additional public and private partners, collaborated to create the Virginia Tech Innovation Campus. The campus, located just one mile from Amazon's HQ2 site, will be one million square feet once it is fully completed. Currently, Virginia Tech's Innovation Campus offers master's degree programs in computer science and software engineering and will add doctoral programs. Virginia Tech is already among the five largest sources of engineering and STEM graduates in the United States, and the school expects the new campus will add 100 additional master's graduates next year. The state and Virginia Tech will contribute $250 million each to fund the project, with remaining funds coming from philanthropy and industry partnerships.

While the Virginia Tech Innovation Campus is Virginia's largest initiative to grow the talent pool, it builds on prior investments. The state increased funding to George Mason University to help the school triple enrollment in computer science and create the Institute for Digital InnovAtion at the Arlington Campus. And with an understanding of the critical need for long-term tech talent development, Virginia adopted mandatory computer science learning standards into its K–12 system in 2017.

IBM Comes to Baton Rouge, Louisiana

In 2013, IBM chose to locate its first software development center in Baton Rouge near Louisiana State University (LSU). To meet the center's tech talent demands and encourage IBM to bring 800 jobs to the region, Louisiana utilized its economic development incentive funds to expand its higher education programs. The state offered $14 million over ten years to support an overall increase in the number of computer science graduates in the region. Of that funding, at least 65 percent was allocated to LSU to expand its computer science department. The plan included tripling the number of computer science graduates at LSU and creating a consortium of high schools, technical colleges, and universities to promote computer-science related career fields. Although IBM has to date fallen short of its initial jobs promise, creating about 500 of the estimated 800 jobs, much of the state's investment will pay dividends not only as IBM grows its presence, but also more broadly by bolstering the region's tech talent pool for a range of current and future employers across industries.

A Tech Talent Engine for New York City

Recognizing the need to continue to diversify the local economy after the Great Recession, in 2010, New York City launched Applied Sciences NYC, a program to incentivize the opening of a university engineering and science center on city-owned land. Cornell University, along with its partner, Technion-Israel Institute of Technology, was selected in a competitive bid process, receiving land on Roosevelt Island and up to $100 million in public infrastructure investment for the creation of Cornell Tech. The resulting campus now offers a range of programs, from a tech-centered MBA to a master's in computer science. Along with a range of incubators and accelerators, the campus serves as a key asset for New York City employers (see sidebar). Since its inception, graduates of the school have created fifty startup companies that have raised a total of $60 million from investors and created about 200 jobs.[46] Currently, 340 students are enrolled at Cornell Tech, and the school expects that number to increase to 1,800 within the next twenty years.[47]

Georgia FinTech Academy

The Georgia FinTech Academy is a recent collaboration between the state's fintech industry and the University System of Georgia to prepare individuals entering or transitioning into the fintech industry through degree programs, educational certificate courses, and apprenticeships and internships.[48] The University System of Georgia developed the Academy's curriculum with help from fintech employers to address industry-specific needs. Students enrolled at any of the twenty-six institutions of the University System of Georgia can obtain virtual access to online courses and degrees. And with a physical hub at the Georgia State University Robinson College of Business, students can also access learning spaces, innovation labs, and research facilities.

The Academy's curriculum focuses on growing students' technical talent, providing experiential and professional learning, and emphasizing innovation-driven research. In addition to the Georgia FinTech Academy's extensive curriculum, there are numerous classes and events offered through the Academy's twenty-six partner institutions covering a comprehensive range of fintech topics, such as blockchain strategy "boot camps" and other fintech-related research discussions at Georgia State University.

Fintech Innovation Lab and Barclays Accelerator

Beyond Cornell Tech, New York City is home to several fintech incubators and accelerators. The FinTech Innovation Lab was founded in 2018 by Accenture and an affiliate of the Partnership for New York City, a nonprofit comprised of corporate leaders, city government officials, and labor groups charged with helping to diversify New York City's economy. The FinTech Innovation Lab provides a twelve-week program to help early- and growth-stage companies improve and test their businesses with the support of a network of leading financial institutions. Participants also receive exposure to venture capital and bank executives. To date, the lab has produced 58 companies, which have raised $790 million and created more than 900 jobs.

The Barclays Accelerator, a thirteen-week program developed in partnership with Techstars, helps fintech startups access key mentors and networks, gain technical assistance, and access funding. Barclays and Techstars invest a small equity stake in each company. The program targets startups focused on a wide range of functions, including machine learning, lending, digital banking solutions, trading, cybersecurity, data analytics, payments, cryptocurrency, insurance, and wealth management. Companies selected for the program are based in Barclays Rise fintech co-working locations in New York, London, and Tel Aviv, with more than 150 companies served since the program's inception in 2014.

6. The Future of Fintech in Delaware

Over the past four decades, Delaware has developed into a leading international center for financial services. The state has a deep base of both large and established firms, as well as ascendant early-stage firms; a sophisticated talent pool across financial and technology occupations; and a reputation as the most cost-competitive location along the Acela corridor, from real estate, to wages, to taxes.

Delaware is a leader in fintech-related patenting activity; has the highest concentration of financial services jobs of any state and one of the highest concentrations of tech talent; sits within the seventh-largest metropolitan labor pool in the country and accounts for the bulk of fintech venture investment across that region; and has proven to be a leader on financial services policy and regulatory issues.

Of course, past returns are no guarantee of future results. As economic activity and talent increasingly concentrate in gateway cities—and as financial services, specifically, continues to undergo rapid technological transformation—Delaware's position in the global financial services industry is still being determined and will require sustained, collaborative efforts across a range of issues.

Supporting Continued Talent Development

Between the University of Delaware, Delaware State, Delaware Tech, Wilmington University, innovative training programs like Zip Code Wilmington, the Delaware Pathways program, and a range of other institutions and programs, the First State has strong talent development assets in place. Continued dialogue around how to best align education and training programs with the needs of local fintech employers is essential. There could be opportunities to build on successful programs like Zip Code Wilmington, not only to expand the tech talent pool, but also to address other talent needs in fintech like regulatory and compliance knowledge and skills. Looking beyond the development of new talent, it will be important to ensure that the existing workforce has access to upskilling opportunities as the skill and technological demands in the financial services industry continue to evolve. While Delaware might not be able to match the size of talent investments that other states have made, they provide a model of the types of investments and collaboration that can move the needle in addressing workforce needs.

Embracing a Regional View

New Castle County—which sits within the Philadelphia metro area—accounts for nearly one-quarter of the financial services jobs in the region and hosts more financial services jobs than any other county in the region, including the city of Philadelphia. This unparalleled density in financial services, and the range of educational and business assets throughout the state, provides a compelling case for financial services firms to consider Delaware as they look at where to establish or expand operations. But just as compelling to many companies is the ability to draw from such a large, regional talent pool and educational infrastructure. Many of Delaware's financial services workers live in Delaware—and increasingly in the city of Wilmington itself as new residential development has taken off—but many also choose to live in Philadelphia, Delaware

County, or Chester County. These options are actually a competitive asset for Delaware. Delaware could become an even more appealing fintech location by continuing to invest in transportation and public education infrastructure to make Delaware increasingly accessible to workers and their families in the region and embracing opportunities to work more closely with leading institutions throughout the region like Penn, Drexel, and Temple.

Exploring Regulatory Opportunities

Delaware has a history of supporting financial services innovation through new regulatory and policy approaches. The emergence of fintech is challenging traditional models of financial services. While always keeping consumer protection in mind, there could be opportunities to pilot new, open and collaborative regulatory models that provide increased flexibility for an emerging industry and position Delaware as the place where fintech innovation occurs. Rather than stretching laws and regulations to cover new applications, there are opportunities to modernize outdated rules so they align with market trends and consumer behavior or to create new laws that can properly regulate emerging financial services products and business models.

Bolstering the Capital Environment

Many early-stage fintech firms in Delaware have received significant venture capital and equity investments, but there are opportunities to strengthen capital markets locally. While the ultimate outgrowth of efforts in this space would be the opening of new local offices by venture capital firms, Delaware's proximity to venture firms in New York, as well as individual and institutional investors across the entire Mid-Atlantic region, creates other opportunities to engage. Leaders could convene officials from top local fintech companies, universities, public agencies, bank venture arms, and other key stakeholders to travel to New York or other investor locations, and hold regular events in Delaware to showcase the unique local fintech environment to investors.

Expanding Incubators and Business Networks

Fintech innovation requires capital, but it is also critical that young companies have sufficient opportunity and space to learn, grow, and build connections. Incubators developed at universities, banks, other intermediaries, or some partnership of those organizations could help fintech startups grow and build the requisite experience and networks to secure funding and get their products to market. Delaware can look to other regions for successful incubator models that are creating successful new companies and jobs while providing critical entrepreneurial experience for participants whether or not their initial startup succeeds—experience that will prove useful in future entrepreneurial endeavors in the local market.

Unique Value Proposition

Delaware has a unique value proposition for fintech firms of all shapes and sizes and its existing strengths create a strong base for a competitive future. Continued coordination, innovation, and investment by a range of private and public sector stakeholders—including incumbent and early-stage firms, the wider business community, state and local government, nonprofit intermediaries, universities, and workforce training programs—will be critical to position the state as a fintech leader in the years to come.

Endnotes

1. Financial services encompass a broad range of financial activity, such as retail banking, investment banking, credit card issuing, consumer lending, and securities.

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