

Chicago Fed Letter

Digital innovation, generational shifts, and the transformation of financial services

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The Chicago Fed's Supervision and Regulation Department and DePaul University's Center for Financial Services held their 11th annual risk conference on April 4–5, 2018. The conference brought together financial industry professionals, academics, and regulators to discuss the technological and generational transformation of financial services and evolving issues concerning risk management and bank regulation.

In recent years, financial services firms have been learning—and adapting to—new ways of doing business as a result of technological advances and changing preferences among their clients and workers. This year's conference highlighted digital transformation of the financial services industry; the current and possible future applications of artificial intelligence (AI) and big data analytics for banking; the generational shifts among bank customers and employees; and the impact of these developments (and other factors) on bank risk and regulation.

Fifth Third Bancorp CEO remarks: A view from the corner office

In the opening keynote address, Greg Carmichael, CEO, Fifth Third Bancorp, provided his perspective on digital transformation. Carmichael said that society and banking are being shaped by consumer preferences to shop and transact online. He emphasized that strategic digital transformation of a bank is chiefly about taking care of its customers and delivering value to them. From his perspective, digital transformation is critical for a bank to retain or increase its customer base.

The conference agenda is available online, <https://www.chicagofed.org/events/2018/risk-conference>.

Carmichael identified three key elements to remain competitive in today's banking landscape: 1) delivering convenience; 2) offering value-added products and services; and 3) promoting an innovative culture. The first two elements are closely interrelated: Banks can deliver convenience to their customers by providing smartphone applications and person-to-person payment networks and by offering a ubiquitous multichannel experience—which includes a website, automatic teller machines (ATMs), physical branches, and call centers. Acknowledging generational shifts in consumer behaviors, Carmichael emphasized that tailoring products and services to millennials is vital. To develop a more innovative work culture, Carmichael said, his firm redesigned its workspaces;¹ transformed its work processes with intelligent automation² and iterative development³ approaches; and overhauled its technology architecture and infrastructure.

Strategic efforts to transform the ways in which financial services firms conduct business with their customers do not come without risks and vulnerabilities, Carmichael noted. As banks migrate to more agile and flexible information infrastructures, more cybersecurity threats may emerge, creating new risk-management considerations. Carmichael pointed out that communication within a firm and across the financial services sector is critical to fighting cyberthreats; he stated that efforts to thwart cyberattacks can be enhanced through the development of consistent industry standards and public-private partnerships.

How are financial institutions changing in response to tech sector developments?

A panel of experts discussed the emergence of Chicago as a technology hub. The panelists also talked about the ways in which their organizations are changing to compete for tech clients and to take advantage of recent technological innovations. Lamont Black, assistant professor of finance, DePaul University, moderated the panel discussion.

Fred Hoch, founder and general partner, TechNexus Venture Collaborative, began the conversation by describing a burgeoning tech industry in the Midwest. Hoch observed that many new and established tech firms have located parts of their operations in Chicago. Indeed, Chicago is currently among the top five technology centers in the United States, he said. Hoch argued Chicago is well positioned to help usher in the next wave of digital innovations. The city hosts world-class universities and companies—such as Amazon (with 10,000 employees in Illinois) and Microsoft, Google, and Salesforce (with over 1,000 employees each).

As a result of the growing tech industry presence across the Midwest, some banks with branches in the region have strategically targeted tech firms as customers. John Hoesley, head of innovation banking, Canadian Imperial Bank of Commerce (CIBC) discussed how his firm has gone one step further by revamping its financial services for technology companies—an effort it has branded as “innovation banking.”⁴ In addition to lending money to technology businesses, CIBC aims to help traditional clients prepare for and implement digitization solutions. Shawn Griffin, senior vice president, MB Financial Bank, contended that for financial institutions to effectively compete for commercial customers (tech or otherwise), they must do more than just offer them credit; rather, they must also demonstrate the ability to help their customers address day-to-day operational challenges. For instance, banks that can deliver innovative digital treasury services⁵ that improve basic functions such as cash management are likely to acquire more clients, Griffin asserted.

Advancements in computational power, cloud computing, big data analytics, and artificial intelligence and machine learning have reshaped the internal systems of financial institutions in profound ways. David Silverman, managing director, office of the general counsel, JPMorgan Chase, described how these technological advancements now allow financial institutions to process very large unstructured data sets to realize valuable opportunities that were unavailable not long ago. Silverman stated that financial institutions must continue to explore what may be possible with advances in artificial intelligence and machine learning, among other nascent technologies, to remain competitive in the future.

Artificial intelligence and regulatory compliance

In his keynote address, Marc Andrews, vice president, Watson Financial Services Solutions at IBM, explained the growing adoption and application of his team’s cognitive system, Watson, which uses artificial intelligence to understand complex data. Andrews said a cognitive system can be defined by three key characteristics: the ability to understand natural language; the ability to reason (more specifically, the ability to understand consequences and take actions accordingly); and the ability to learn. While still in the very early phases of development and use within the financial services

industry, Watson has made significant progress already. It can read laws and regulations, understand their applications, and identify where a firm may be subject to regulatory compliance. Andrews explained that understanding, reasoning, and learning by Watson cannot happen independently at this stage; subject matter experts must still guide the cognitive system. He said that at this point, it might be more appropriate to think of Watson as “augmented intelligence.” He argued that humans partnering with machines is what will allow artificial intelligence to be successful.

According to Andrews, nowadays AI applications in the financial services industry are used primarily to achieve the following three objectives: ensuring/managing regulatory compliance, conducting surveillance, and defending against financial crimes. For instance, banks’ use of AI applications to comply with the Customer Identification Program (CIP) rules and requirements in the United States⁶ (as well as other similar know-your-customer regulations in other jurisdictions) has been helpful in combating financial crimes, particularly money laundering. Additionally, compared with the current industry standard system, an AI-enhanced system has been shown to significantly reduce the number of false positives for money laundering attempts, Andrews observed.

In closing, Andrews said that although artificial intelligence has a long way to go before it reaches the levels of sophistication imagined in pop culture, it seems as if the promise of AI in banking is beginning to be realized.

Data analytics today: Principles, best practices, and real-world applications

A diverse panel of speakers discussed their principles and best practices for—and recent experiences with—preparing, using, and analyzing vast amounts of data to meet various business objectives. The confluence of enhanced data management solutions, increased computing power, and better data analytics techniques has positively impacted the ways firms in various industries use data to conduct business. However, the very large volumes of data, which can now be effectively analyzed with AI and other tools, still present some challenges. Andre Reynolds, vice president, Federal Reserve Bank of Chicago, moderated the panel and provided an overview of the recent trends in data analytics.

Andrew Boettcher, quantitative manager, Federal Reserve Bank of Chicago, noted that the quality of the data needs to be addressed well before any analytics are performed on them. The panelists discussed several approaches to ensuring data quality—such as consistency checks across related data sources. The panelists went on to discuss approaches for maximizing the value of data. Sean Naismith, head of analytics services, Enova Decisions, acknowledged the overwhelming task of choosing appropriate data given how much is available. Naismith suggested one approach to maximizing the value of data is to explore different combinations of data sets, test the outcomes, and use different decision models to evaluate results. Aleksandar Velkoski, adjunct professor, DePaul University, explained that data governance is an important prerequisite for maximizing the value of data. Both Velkoski and Boettcher underscored the need for the information technology (IT) department and the business lines of a firm to determine their respective roles in controlling, maintaining, and securing the data. Boettcher said that data security should be worked out ahead of providing data access across an organization. A key challenge among large firms seeking to leverage their data across their business lines is establishing a common data platform that all appropriate parties can access securely, reliably, and efficiently, Boettcher observed. Without addressing these issues related to using big data, firms may face increased cybersecurity and reputational risks.

Some real-world applications of new data analytics tools were provided by Donna Salvatore, founder and CEO, Megalytics. Salvatore explained how her company is using artificial intelligence to analyze big data for its commercial real estate clients. In one example, she shared how her company used AI to significantly reduce the time spent on reviewing and assessing lease documents (from several weeks to several days) as part of the due diligence process. Salvatore also explained how her

company was able to combine artificial intelligence, satellite parking images, and demographic data to help property owners better understand what types of tenants would be most successful in their retail centers.

In closing, Reynolds said that what's now possible using AI and other data analytics tools is quite impressive—as evidenced by Salvatore's examples—but firms must not forget to ensure data quality and security first if they want to deliver optimal results for themselves or their clients.

How are millennials and Generation Z reshaping financial services?

Together, millennials and Generation Z (Gen Z for short)⁷ are a force, representing over one-third of the U.S. population. By 2020, members of both generations are estimated to make up over half of the U.S. workforce. Many millennials witnessed the introduction and global proliferation of several innovative digital technologies (such as smartphone applications and social media platforms), and the vast majority of Gen Z is unfamiliar with a world without these inventions. Tiffany Allen, vice president, talent acquisition, Byline Bank, made these observations while moderating a panel that discussed how millennials and Gen Z—as both customers and employees—are influencing the transformation of the financial sector.

Clearly, financial institutions have started to rethink how they interact with millennial and Gen Z customers, as evidenced by the recent shift from branch banking to mobile banking. Tom Ormseth, senior vice president, digital channels and transaction banking, Wintrust Financial Corporation, noted that while millennials seem to be moving away from a more community-focused branch structure, Gen Zers are more invested in their communities and a high percentage of them do

Millennials and Gen Z—as both customers and employees—are influencing the transformation of the financial sector.

want a physical location. The panelists agreed that some combination of branch and digital offerings is likely to best serve both millennial and Gen Z customers. A digital approach may be appropriate for simple transactions, but most customers, even young ones, still

prefer in-person one-on-one interactions for more complex transactions. Seth Heape, vice president, human resources, MB Financial Bank, noted that the ability to have in-person consultations is still essential for banking. The other panelists agreed that while branches are not going away, financial institutions should be thinking about how their branches can be tailored to better meet the needs of millennial and Gen Z customers—perhaps by becoming more digital.⁸

The panelists disagreed with the common perception that Gen Z customers are not profitable. Jeff Plagge, president and CEO, Northwest Financial Corporation, argued that developing relationships with young people is an investment that will pay dividends as their finances grow. Evidence suggests that members of Gen Z are generally going to school later than people of previous generations and thus graduating later, getting married later, and buying houses later, said Plagge. Given these changes, the suite of products and services offered to help meet these life goals will need to be reconceived if banks want to profit from Gen Z customers. The initial contact strategy is also critical for being able to effectively engage these customers over the long term, noted Plagge. To reach the young demographic initially, Rob Pelkowski, senior director and associate general counsel, Venmo, suggested offering different lending packages geared toward Gen Z interests, such as lending packages for travel.

Besides making changes for the sake of customer acquisition, financial institutions are adjusting their work cultures and policies to hire and retain millennial and Gen Z employees. Panelists discussed how leadership development and other pathway programs are attractive to potential millennial and Gen Z employees; jobs that provide more flexibility or strike a better work-life balance will also be more appealing to them. Flatter (less hierarchical) organizational charts, frequent

performance feedback, and continuing professional development and training opportunities were mentioned as being important to young employee retention. Pelkowski mentioned that millennials and Gen Z are naturally curious and that offering new opportunities or movement within the company is beneficial in retaining young talent. Pelkowski added that the greatest danger to innovation and growth in the financial sector would be to stifle the creative minds of millennial and Gen Z workers.

Remarks by the Chicago Fed president and CEO

Charles Evans, president and CEO, Federal Reserve Bank of Chicago, discussed economic conditions, monetary policy, and the regulatory environment. Evans indicated that economic fundamentals were strong. While trade policy issues didn't appear to have moved the needle for the trillion dollar U.S. economy, he noted that if trade tensions increased and led to a trade war, that could have a material effect on economic growth in the future. With the economy's unemployment rate hovering around 4%, Evans discussed how some businesses are experiencing difficulty finding workers. He noted the future may not offer much relief on the hiring front if the median unemployment projection by the Federal Open Market Committee (FOMC)—the Fed's monetary policymaking arm—turned out to be correct; according to the most recent median projection at the time of the conference, the unemployment rate was expected to decrease through 2020, to 3.6%.⁹

Turning to the regulatory environment, Evans noted positive outcomes from regulatory policies implemented since the financial crisis, including higher levels of bank capital, regularly scheduled stress testing for certain banks,¹⁰ and better resolution planning¹¹ (in the event of material financial distress or a failure of a bank). Evans emphasized how it is appropriate and important for policy-makers and regulators to continuously assess regulation and ensure it is properly tailored to the size and complexity of the financial institution under review.

Assessing the health of the U.S. banking sector

Speakers on the final panel of the conference covered a wide range of topics related to the health of the U.S. banking sector—including higher growth for the U.S. economy, rising interest rates, and technological innovations. The panel's moderator was Martin Essenburg, executive director, Center for Financial Services, DePaul University. He started the discussion by asking how banks have benefited from the improving performance of the U.S. economy during the past year. Eric Compton, equity analyst, Morningstar Inc., noted that as the economy emerged from the Great Recession, the narrative for banks was negative, but over the past year, their narrative has become positive. Rising interest rates have enabled banks to replace low-yielding assets with higher-yielding ones, resulting in increased profitability, he said. Compton indicated that many regulatory reforms made in response to the financial crisis and ensuing recession have led to a sounder financial system. Despite these improvements, panelists cautioned that sound risk management for banks is as important as ever.

Michael Johnson, executive vice president, Federal Reserve Bank of Atlanta, pointed out that the price sensitivity of bank deposit flows can be challenging to forecast and that some financial institutions will likely need to do more work on this topic to better understand and calibrate their deposit mix and pricing strategies, especially in a rising rate environment. Johnson noted that other important trends for banks are the flattening of the yield curve¹² and the rise in commercial real estate property values, which may pose risks to the financial sector.

Other panelists commented briefly on the risks and opportunities posed by technological innovations. With respect to cybersecurity risk, Arthur Lindo, deputy director, Board of Governors of the Federal Reserve System, indicated it is important to develop ways to detect impending attacks or attacks that have already occurred surreptitiously. It is also vital to figure out how to recover from such

attacks. Doreen Eberley, director, Division of Risk Management Supervision, Federal Deposit Insurance Corporation, offered her perspective on the influence of fintech¹³ on the financial landscape, noting distributed ledger technology¹⁴ will have an impact comparable to that of the internet over the next several years.

Conclusion

The conference focused on the technological and generational transformation of the financial services sector that began over the past few years. It also touched on some of the new risk-management issues that have arisen as banks employ digital innovations to compete for new customers. Even as the economy continues to grow—and both unemployment and inflation remain low—financial services firms must remain vigilant for emerging signs of risk, especially while exploring new applications for technological advances.

¹ An example of Fifth Third's approach to workspace redesign is available online, <https://www.bizjournals.com/columbus/news/2018/06/15/fifth-third-banks-office-rebuild-mirrors-company.html>.

² Intelligent automation combines artificial intelligence and automation to streamline decision-making processes. Further details are available online, <https://www2.deloitte.com/insights/us/en/focus/signals-for-strategists/intelligent-automation-a-new-era-of-innovation.html>.

³ Details on the iterative development approach to building software applications are available online, <https://searchsoftwarequality.techtarget.com/definition/iterative-development>.

⁴ Further details on CIBC's innovation banking are available online, <https://us.cibc.com/en/commercial/specialty-banking/technology-banking.html>.

⁵ Treasury services, or treasury operations, involve the management of payables (e.g., payroll disbursements) and receivables (e.g., credit card payments) and other related activities, including reporting revenues and expenses and investing excess capital.

⁶ Information on the U.S. CIP rules and requirements is available online, https://www.ffeic.gov/bsa_aml_infobase/pages_manual/olm_011.htm.

⁷ Millennials are those born between 1981 and 1996, and members of Gen Z (who are sometimes referred to as post-millennials) are those born in 1997 and afterward, according to a March 1, 2018, Pew Research Center piece, <http://www.pewresearch.org/fact-tank/2018/03/01/defining-generations-where-millennials-end-and-post-millennials-begin/>.

⁸ For instance, bank branches could equip their employees with tablets so that customers can be helped anywhere on site; branches could also install interactive welcome screens and electronic walls to direct customers or market products to them. More examples of how branches can become more digital are available online, <https://www.mckinsey.com/industries/financial-services/our-insights/a-bank-branch-for-the-digital-age>.

⁹ Evans's remarks about the FOMC unemployment forecast were based on the March 21, 2018, Summary of Economic Projections, available online, <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20180321.pdf>.

¹⁰ Information on stress testing is available online, <https://www.federalreserve.gov/publications/comprehensive-capital-analysis-and-review-questions-and-answers.htm>.

¹¹ Information on resolution plans is available online, <https://www.federalreserve.gov/supervisionreg/resolution-plans.htm>.

¹² A yield curve shows the relationship between yields and maturity dates for a set of similar bonds (usually Treasury bonds) at a given point in time. So, a flattening yield curve means that the difference between short-term and medium- or long-term interest rates is narrowing (historically indicating an increasing risk of entering a recession).

¹³ The Financial Stability Board defines fintech as "technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services" in a June 2017 report, <http://www.fsb.org/wp-content/uploads/R270617.pdf>.

¹⁴ Details on distributed ledger technology (and some of its potential applications for the financial sector) are available online, <https://www.federalreserve.gov/econresdata/feds/2016/files/2016095pap.pdf>.

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