

**Record of Meeting**  
**Federal Advisory Council and Board of Governors**  
**Thursday, December 2, 2021**

**Item 1: Economic Activity**

**How do Council members see business activity among their clients and other contacts trending since the September meeting? Are Council members, clients or contacts seeing any new areas of strength or weakness?**

**Business trends since September**

All Council members noted that activity remained strong despite supply constraints, rising costs, and rising prices. After a weak third quarter, several Council members said that (1) growth is already starting to pick up as Covid cases ease and (2) they expect a strong fourth quarter as a whole. Council members see strong but slowing growth next year. (Note: The timing of the meeting coincided with recent news about the new Covid variant, Omicron. As such, Council members did not yet have data on its impact.)

Council members noted that spending is being driven by the income recovery and the liquidity left over from last year. Factors contributing to the liquidity include (1) people were unable to spend on many services in the past year and (2) some stimulus money went to households with still healthy incomes. One Council member noted that companies reliant on the Paycheck Protection Program funds are experiencing a “pandemic hangover,” but Council members are generally optimistic of a continued pickup in business in the coming quarters.

The consumer is expected to remain a big driver of growth, but with more strength in spending on services rather than goods. Council members cited increasing growth in a number of service sectors, including hospitality, travel, transportation, hotels, car rentals, and restaurants. Card spending remains strong and has picked up in the last month as the economy moves past Delta and the shift away from cash and toward online spending persists. The housing market remains strong, with booming prices and rents, and RV industry shipments continue to set new records.

Most Council members also noted strong business investment. Positive signs include increased small business credit and expanded lines of credit. One Council member stated that capital expenditure budgets for many companies are strong going into 2022. Businesses are also increasing investment because of pent-up demand and reduced concern about future Covid-related lockdowns. Areas with increased investment include healthcare, industrial products, food products, and wholesale supply.

**New areas of strength**

While no new areas of strength were reported, Council members pointed to a number of industries—mainly concentrated in the service sector—where activity was rapidly rebounding. A strong ongoing pickup in leisure travel is expected.

**New areas of weakness**

A big concern among Council members and their clients is persistent constraints on supplies and the resulting cost and price pressure. Clients across many industries are being hurt by shipping delays and other logistical issues, both of which are impacting final products and vital components. Several Council members noted that supply constraints have eased a bit but still remain severe.

Autos and housing seem particularly supply constrained with no near-term sign of abatement. Many restaurants—particularly at the high end—face severe labor shortages and have responded with reduced hours and higher prices. One Council member commented on logistical issues, saying they were a bigger

problem for smaller companies that have more difficulty changing supply chains. Another Council member noted that the agricultural sector is having a strong year—in terms of both prices and yield—but concerns about the supply of key inputs (seed, chemicals, and fertilizer) could spell trouble ahead. Council members remarked that even when supply issues are resolved, it will take time to rebuild inventories back to normal levels. This need to rebuild, along with the normal lags in passing through cost increases, could mean price pressure will remain for some time to come.

One Council member noted that considerable uncertainty about upcoming tax and regulatory changes could be having a dampening impact on the economic recovery.

## **Item 2: Labor Markets**

**Have Council members seen labor shortages increase or decrease, in their own institutions or in those of clients and other contacts, since the September meeting? What new strategies have Council members used, or seen used, to attract workers? Do Council members see these strategies as temporary or permanent potential solutions?**

### **Summary**

Since the September meeting, Council members have not experienced an easing of labor market shortages. They reported that (1) businesses generally continue to struggle to find workers and (2) potential employees have been slow to return to work after the substantial number of furloughs and layoffs caused by the pandemic. According to the National Federation of Independent Business, in October, about half of small business owners reported having positions they could not fill, exceeding the 48-year historical average of 22%.

Various factors are contributing to individual decisions not to return to the near-record 10 million job openings. Some people have not returned to the workforce because they have childcare responsibilities or lingering health concerns related to the pandemic. Generous unemployment benefits and (now expired or soon expiring) rent moratoriums—as well as the buffer of increased savings—may also have factored into the decision not to return to work. And retirements, driven by robust 401(k) balances, have accelerated. Finally, some people are opting for self-employment in the “gig” economy, including delivering groceries and takeout food, or providing transportation services.

Increased attrition rates are compounding the labor market issues. A record 4.3 million people quit their jobs in August, and resignation rates were higher among employees who work in fields—such as restaurants, healthcare, retail, and hospitality—that have been subject to increased stress due to the pandemic. Council members reported labor shortages across other industries as well, particularly in the highly specialized technology and cybersecurity areas, and shortages are apparent across the board—from entry-level jobs to more senior positions. The warehousing and transportation industries also have been impacted, contributing to supply chain issues.

Council members reported that businesses have responded to these pressures by raising wages, offering even more flexible work arrangements, and increasing incentives and benefits. The ability to work remotely or on a hybrid schedule remains an important factor for workers, with some Council members reporting that the majority of their workforces preferred remote or hybrid arrangements.

**Have Council members seen labor shortages increase or decrease, in their own institutions or in those of clients and other contacts, since the September meeting?**

Consistent with the September meeting, most Council members reported continued staffing challenges in their organizations, with some Council members commenting that retail branch, frontline, and entry-level openings remain difficult to fill. This difficulty has led some institutions to operate branch networks with reduced staff or curtail weekend operating hours, similar to trends seen in other service sectors, such as the restaurant industry.

One Council member noted that the decrease in labor supply and increased competition for labor cuts across all major geographic markets. Competition for talent has also broadened beyond traditional financial firms and is now also coming from other sectors, including the retail industry, fintechs, consulting firms, and start-ups.

Most Council members reported that turnover has increased. The turnover rates are highest in customer-facing businesses, for newer employees, and for those with high-performance histories, with one member reporting that internal job postings to fill vacancies have increased 26% above pre-pandemic levels. That same institution has experienced more departures as of the end of October 2021 than it did in the entire year of 2019. Exit interviews indicate that people are leaving to accept other job offers, for personal reasons such as childcare responsibilities, and because they are ready to retire. Meanwhile, applicant volume has dropped 42% below pre-pandemic levels. The institution's ratio of external applications received to new openings per month is currently 11-to-1 versus a pre-pandemic ratio of 19-to-1.

Council members' business line staff who work with clients and other contacts reported labor issues across most industries. Clients are experiencing difficulties, particularly in entry-level positions, as hourly wages continue to rise, and as many businesses compete for entry-level workers. Anecdotal information from client discussions indicated their frustration with finding and keeping quality workers, with added wage and salary costs being a headwind. These clients stated that their businesses are still growing but the growth would be stronger if they had adequate staff.

Many businesses, including restaurants and pharmacies, are displaying signs asking for customers' patience, and the lack of full staffing has caused some to curtail their hours. Grocery stores are also impacted due to limited staff, including cashiers. Growth is also impeded in the home improvement sector and the trade industries, with labor shortages in the transportation sector also impacting supply chains.

#### **What new strategies have Council members used, or seen used, to attract workers?**

Council members reported increasing wages, providing sign-on bonuses, engaging in employee referral campaigns, providing flexible work arrangements, and expanding benefits, including childcare. One firm noted a marked increase in the extent to which they offered sign-on bonuses this year compared to pre-pandemic periods. Another firm reported increasing its minimum hourly wage to \$20 and providing all employees with a minimum of 100 shares of stock.

Firms are also increasing recruitment staff and reviewing talent strategies in relation to fundamental shifts in employee preferences. Companies are focusing more on well-being and lifestyle factors such as flexibility, mental health, and burnout. Some Council members reported rethinking frameworks to better understand how employees are aligning with corporate values and defining what is meaningful for them. Those Council members are then using the information they glean to better inform their talent and retention strategies.

Council members stated that their clients are engaging in the same type of activities and providing similar incentives to attract talent. As an example, one member noted that the large majority of borrowers in its restaurant/franchise portfolio have had to raise wages and, ultimately, raise menu prices to compete.

#### **Do Council members see these strategies as temporary or permanent potential solutions?**

The Council's general consensus is that labor markets will remain tight at least through (1) the full opening of sectors still impacted by the pandemic and (2) the conclusion of remaining government-support programs. Funds provided from the recently enacted infrastructure bill could also add pressure to labor markets, given the number of positions that will be needed to plan, design, develop, and build projects.

Several Council members believe that (1) the wage increases are permanent and (2) employers will need to keep the recent hiring incentives in place in the longer term to attract and retain talent. The same can be said for hybrid and remote work protocols going forward. Many firms have adjusted their longer-term views of hybrid and remote models and will have significant portions of their workforces under these

arrangements as staff return to the office over the next several months. The principal concern of businesses remains finding available talent; as a result, firms are adjusting their business models to compete for talent. Council members agreed that in some way this adjustment reflects a level of competition usually associated with full employment and as a result will continue to pressure labor costs.

### **Item 3: Inflation**

**Based on Council members' own experience and the experience of their clients and contacts since the September meeting, please comment on the following:**

- a) Are the prices of products and services rising more quickly or less quickly than in the recent past? Are Council members or clients and contacts starting to change pricing strategies? If so, how?**
- b) Is there evidence that supply chains are reconnecting, or do persistent supply frictions remain? Are there industries or geographic areas in which expansion is impaired by supply constraints?**
- c) Have recent levels of inflation changed the inflation expectations of consumers and businesses? In the Council's view do inflation expectations remain well anchored?**

**Are the prices of products and services rising more quickly or less quickly than in the recent past? Are Council members or clients and contacts starting to change pricing strategies? If so, how?**

Council members noted that prices continue to rise at least as fast, or faster, than at the same time last quarter. There continue to be broad-based price increases, which consumers have generally accepted. Clients and businesses do not believe that inflation is as transitory as originally thought, with increased costs of goods impacting margins and pricing in the short term and into 2022 projections.

Generally, upward pressure on prices has continued. The Consumer Price Index increased 6.2% year-over-year in October 2021, as supply chains remained under pressure, and fuel and rent costs increased. Wilmington Trust's third quarter 2021 Business Owner Outlook Survey found that more than half of large businesses raised prices in the prior six months and also planned to raise prices in the next six months. Similarly, the National Federation of Independent Business's October 2021 Small Business Survey indicated that 53% of those entities reported price increases over the past three months, and 51% reported plans to raise prices in the coming three months. These percentages were at their highest levels since the early 1980s, moving up five percentage points or more from the previous month in September, when both were at 46%.

Council members noted that clients in the real estate and the commercial and industrial (C&I) industries see prices rising more rapidly than in the recent past. C&I clients are seeing unprecedented increases in prices on many raw goods, labor, energy, and transportation. The price of importing shipping containers from Asia continues to rise (with prices now six to ten times higher than pre-Covid levels). Real estate clients (both residential and commercial) are also seeing a rise in prices, with some estimating that prices will not stabilize until mid- to late 2022.

It appears that consumer price increases are being passed along at a faster rate than commercial price increases. The cost of food has steadily risen, especially for food away from home (such as meals from restaurants). Companies are also seeing higher carrying costs, as they are holding more inventory to head off price increases and to avoid supply-chain issues. On the real estate front, builders are starting to include heftier repricing options in their construction contracts, and many developers are considering raising rents to maintain acceptable returns. All these changes have resulted in higher finished goods prices being passed along to commercial and consumer customers.

Council members noted that despite rising prices, demand remains strong, which has allowed businesses to pass increases on to consumers. Debit card data is showing little evidence that inflation is affecting

consumer spending patterns in recent months, with spending up more than 30% year-over-year every month since March.

**Is there evidence that supply chains are reconnecting, or do persistent supply frictions remain? Are there industries or geographic areas in which expansion is impaired by supply constraints?**

Council members remarked that supply chains have not reconnected, and persistent supply frictions remain. The October ISM manufacturing and services reports found that supply chain frictions persist across nearly all sectors, and the frictions are particularly bad for manufacturing firms, indicating that the supply chain issues are worsening rather than improving. Input shortages and transportation difficulties are broad-based across industries and geographical areas, although the problems are especially acute for imported goods. In general, Council members are hearing that companies believe it could take at least until mid-2022 for the supply chain problems to be resolved. The NFIB October 2021 Small Business Survey pointed to still-elevated supply chain issues, but the survey also indicated some moderation relative to the record highs seen in July 2021.

Council members still see supply chain vulnerabilities across all sectors, especially for businesses with global supply chains. Shipping delays, increased freight costs, and warehouse and truck driver shortages have increased prices for consumers and impacted company margins and the pace of product availability. Industries that depend on chip production—including car manufacturers and consumer electronics companies—have continued to see demand severely outpace the ability to supply, stifling sector-wide expansion.

The continued congestion at U.S. ports (namely, Los Angeles and Long Beach) have strained supply chains. Council members do not expect the demand to subside, nor do they expect the supply chain disruptions to improve in the near term, especially as we enter the holiday months, when consumer spending is traditionally high. C&I clients are highly concerned about supply chain constraints, especially when it comes to making strategic business expansion moves in the next year.

- The automobile industry remains particularly restrained by shortages of semiconductors. Automobile sales plummeted at an annualized rate of 50.2% in the third quarter because of lack of supply.
- Agricultural clients are concerned about their ability to obtain key items such as fertilizer, and higher diesel prices may hinder production in the coming year.
- Those who work in the textile industry—whose suppliers are from Pakistan and other emerging markets—are concerned that they will miss their seasonal windows for clothing lines.
- Both commercial and residential construction are being impaired by shortages of paint, tile, flooring, appliances, and other general construction materials.
- In real estate, development projects have been tabled or delayed due to rising costs, while other projects have been delayed because of the inability to get certain items—for example, appliances and countertops—needed to complete the project.
- Imports continue to be a challenge, with a particular impact on equipment financing for the construction and agriculture sectors. Obtaining parts continues to be the primary challenge, with many vendors holding partially completed equipment in inventory while awaiting the final installation of unavailable parts. Council members are now hearing that new equipment deliveries are stretching into 2023.

**Have recent levels of inflation changed the inflation expectations of consumers and businesses? In the Council's view do inflation expectations remain well anchored?**

Council members noted that short-term inflation expectations are well established and may extend into the first half of 2022, as we unwind historical imbalances—largely tied to the pandemic—on both sides of the supply and demand curve. In general, consumers and businesses are more concerned about the persistence of higher prices, but there is an expectation that the rate of increase should slow sometime in 2022. Clients'

views on longer-term inflation are mixed. Some expect inflation to slow in the future, with prices declining for some inputs. Others expect higher inflation to persist.

Clients are particularly concerned about the persistence of higher wage inflation. Many of them believe that the labor component of current cost increases is likely to be permanent and increase long-term costs, while the material component of inflation may abate as disruptions are overcome and strong supply chain activity returns—but the outlook is quite murky. There are expectations that energy costs will continue to climb and further exacerbate pricing pressures caused by shortages in goods and logistical infrastructure. Inflation is expected to be more persistent for goods than services, particularly for technology goods.

Consumer concern about persistently higher inflation is building. Consumer demand has been historically high, largely driven by government support during Covid, including the stimulus, rent forbearance, and loan relief. However, price pressures may ease as consumers begin to use their savings and take on more debt. Until consumer demand eases or supply chains strengthen—or both—prices will likely continue to increase.

#### **Item 4: Fed Policy**

##### **What are the Council's views on the stance of monetary policy, including portfolio activities?**

Council members believe the stance of monetary policy remains highly accommodative in light of current economic conditions. Council members support the controlled asset tapering that has begun following the FOMC's November 3 announcement, and they now see the potential need for an acceleration in the size and pace of the current tapering program.

Market expectations are pricing in several interest rate increases in 2022. The unemployment rate is expected to soon be consistent with full employment, although Council members continued to note that labor market participation remains a meaningful challenge across all industries and geographies. Recent inflation readings have exceeded the FOMC's targeted 2% goal, though it is clear that supply-chain constraints are a contributing factor.

The carefully telegraphed tapering of bond purchases has been absorbed by financial markets with little reaction. A slower pace of asset purchases has been offset by lower Treasury supply amid a reduction in Treasury auction sizes and lower mortgage-backed securities supply due to a slowdown in mortgage financing activity. Starting the asset tapering before increasing the Fed funds rate has allowed for further healing in the economy, especially as inventories, which are financed at short-term rates, begin to gradually rebuild.

Given how well financial markets have responded, and in light of current economic conditions, Council members see the need to consider an acceleration in the current announced tapering program. Council members suggested considering reducing the balance sheet, via a reduction in reinvestment, before raising short-term rates—essentially unwinding quantitative easing and then following with a focus on rates—as a way to alleviate some price pressures.

Council members noted that a near-zero federal funds rate and continued portfolio purchases are supporting the flow of credit—which has been needed to support an uneven economic expansion—to households and businesses. Portfolio purchases are also leading to abundant liquidity, which has been well-handled by reverse repurchase agreements. Although Federal Reserve assets are still growing, pandemic loans have declined from their 2020 peak.

The Fed's enhanced transparency and communication have been helpful in describing three conditions for a tightening cycle to begin: (1) maximum employment in labor markets, (2) inflation at 2%, and (3) sustained 2% inflation levels for some time. Council members discussed numerous examples of customer interactions that suggest inflationary expectations have accelerated relative to the last Council meeting—thus creating further expectations that these factors are unlikely to ease in the coming months.

The labor market continues to make considerable progress. However, the labor force remains 3 million below its pre-crisis level, and the number of nonfarm payrolls is 4.2 million below its pre-crisis level. Council members all noted labor as a continued challenge impacting their own institutions as well as the customers they support across a wide range of industries and geographies. Accommodative monetary policy has helped create more job openings than unemployed people, helping draw people back into the labor force.

Council members noted that the pandemic has led to unequal outcomes: Nonwhite unemployment rates remain further above pre-pandemic levels, suggesting there is room for additional labor market recovery. Still, with the unemployment rate expected to soon fall below the CBO's estimate of full employment, market expectations of the federal funds rate suggest achievement of one of the FOMC's tightening conditions.

The economic expansion continues to be uneven; demand for goods remains elevated following past government support, while services spending continues to grow more slowly amid behavioral changes due to the pandemic. At the same time, the production of goods has been limited by international Covid outbreaks and lockdowns. These factors have led to supply-side dislocations that monetary policy may be unable to alleviate.

Rapid inflation has not yet proven to be transitory; however, Council members acknowledged the dynamic environment. Inflation expectations, as measured by the 10-year TIPS breakeven rate, have risen to a 16-year high of 2.8%. Inflation has risen well above 2% and is on track to exceed 2% for some time, meeting two of the FOMC's preconditions for liftoff. A key question remains: Will the return of workers to the labor force begin to ease supply constraints and production issues and begin balancing inflationary pressures?

Balancing the dual mandate and three conditions to begin liftoff of a tightening cycle, Council members understand the current stance of monetary policy, but they have heightened awareness of sustained inflationary pressures. Council members suggested that risks of inflation warrant consideration of raising short-term rates in 2022.

## **Panels: Council Members' Experiences with New Technologies: Are these New Technologies Game Changers?**

### **Panel #1:**

**Can Council members discuss and provide examples of how new technologies (including decentralized finance (DeFi)), and the organizations these new technologies enable, are reshaping the competitive banking environment for Council members' institutions?**

*Among the topics to consider:*

- *Basic banking: commercial & retail lending; deposit taking; payments processing*
- *Other basic financial services, such as investment management or insurance*
- *Handling innovative financial instruments, such as investing or transacting in cryptocurrencies or stable coins*

### **Summary**

Council members stated that technology innovation is reshaping every industry, including the financial services sector. Banks are competing to acquire and retain customers who have expectations about service delivery driven by intuitive digitized experiences that are being created by companies across all industries that have digital-first and customer-centric strategies. Fintechs and nonbanks are increasingly expanding their reach into traditional bank products and services. A significant amount of capital is being invested into the fintech space—estimated to have grown from \$1 billion in 2010 to more than \$20 billion in 2021—and

that capital is helping to propel these innovations. Although innovation is beneficial because it lowers costs, improves the customer experience, and delivers value-add services, it often creates new risks for the financial system that need to be appropriately addressed and managed.

The three trends that Council members see potentially reshaping the banking landscape include banking as a service (BaaS), embedded finance, and decentralized finance (DeFi). To compete, banks are being compelled to consolidate in order to scale their technology investments.

### **Banking as a Service**

BaaS solutions are available across almost every aspect of the customer experience, from front-end services such as opening a deposit account to back-end utilities such as “know your customer” checks and BSA/AML processes. BaaS solutions make it significantly easier for a wide range of non-banks to become bank-equivalents to a growing customer base that is increasingly more open to working with non-bank institutions. A standard use case includes leveraging bank licenses via pass-through partnerships to offer deposit-gathering capabilities, and then building upon this by offering credit solutions and investment capabilities.

By their nature, BaaS relationships are riskier than traditional customer/bank relationships and require additional oversight. Fintechs operating as “synthetic” banks typically leverage a regulated entity, which is often a smaller enterprise with fewer resources and is one step removed from customer interaction, thus introducing operational, compliance, and reputational risks to the system. Limited oversight around data management, privacy rules, and the use of artificial intelligence (AI) can pose a risk when non-banks create products and services that may not conform to client and regulatory expectations.

### **Embedded Finance**

A close relative of BaaS is embedded finance, which encompasses financial solutions offered by non-banks created to meet a specific customer need. Consumers are increasingly willing to use financial services from non-banks, in particular e-commerce brands. Non-banks that have been successful in this area have provided ways to embed products and services—such as payments, credit, and insurance—within their digital platforms.

Council members mentioned Buy Now Pay Later (BNPL) as an example of embedded finance that is gaining popularity. BNPL provides consumers with the option of making installment payments when purchasing products, typically with no fees. BNPL options have been seamlessly built into the checkout experience and provide an alternative payment option that has the potential to shift consumers away from traditional bank loans and credit cards toward periodic debit transactions and ACH transfers.

Some of the largest e-commerce and technology companies have entered the space through new products, acquisitions, or partnerships, largely focused on payments. Large financial institutions are also competing with acquisitions and partnerships of their own. Finally, the offer of digital wallets by phone makers is yet another example of embedded finance that has gained traction.

### **Decentralized Finance**

Council members noted that DeFi has seen significant growth recently and is designed to remove intermediaries between transacting parties leveraging blockchain technology. The most popular use case is the cryptocurrency exchange, which offers customers a way to (1) buy and sell cryptocurrencies, some at attractive yields, and (2) lend or borrow against digital assets. While DeFi holds some attraction from an operational perspective through smart and transparent contracts, significant work remains to understand how it would fit into a robust legal and regulatory framework that is critical for customer interactions.

If DeFi platforms continue to become more accepted, they have the potential to innovate new services that may be difficult to provide in the traditional financial services model. These services include real-time



payment processing, liquidity pools, synthetic tokens, and increased access to a wider range of high-yielding assets. Unfortunately, bad actors have been attracted to the DeFi space, and there have been several notable examples of fraud and use of the system for ransomware attacks.

Council members noted that cryptocurrencies continue to see investment-focused use cases (that is, store of value), but to date have had minimal adoption for payments purposes due to their volatility. However, research indicates the likelihood of future growth and, in particular, increasing demand in the consumer space. One such example is card rewards being paid in cryptocurrency. Network payment processors are beginning to offer cryptocurrency products and services to their partners in the United States. As a result, card issuers will be able to offer cryptocurrency as rewards for transactions, in lieu of traditional loyalty points, and customers will be able to spend their crypto holdings to pay for purchases.

For banks, there is increasing pressure to offer cryptocurrency services to retain existing customers and gain new customers. Institutions report that they are being asked by some customers to accept cryptocurrency for payments. Additionally, some brokerage firms are including access to the newly offered Bitcoin and crypto-ETFs on their trading platforms to compete with DeFi exchanges, which provide for direct investment into a variety of cryptocurrencies.

Significant risk in today's market structure is created by the fact that DeFi companies are not currently subject to comprehensive consolidated supervision. Contributing risk factors include a limited and fragmented regulatory and legal framework, the rapid expansion and mixing of wholesale and retail activities at some crypto firms, the threat of fraud, and the susceptibility to cyber-attacks. Financial institutions are monitoring these risks while taking into account market demand as they make ongoing decisions as to whether it is appropriate to offer crypto-related services with sufficient safeguards.

### **Technology innovation leading to bank consolidation**

Council members remarked that the race to innovate (and in some cases to stay relevant and keep up) combined with a very competitive labor market is serving as a backdrop for bank consolidation. This has also led to banks cooperating by building shared platforms, such as Zelle and Akoya. Small and medium-sized banks that have largely outsourced their technology will have a harder time differentiating their business model. The investment required to go through digital transformation and keep and retain talent may be viable with scale only by merging with another bank.

### **Panel #2**

#### **Can Council members illustrate how new technologies are driving their decision making and the resulting evolutionary path of Council members' banks?**

*Among the topics to consider:*

- *Improving the capacity and efficiency of core "back office" systems*
- *Meeting customers' demands for services & service delivery*
- *Recruiting and retaining talent*
- *Building third-party relationships*
- *Consolidating with other banks through M&A*

New technologies today are ubiquitous and evolving rapidly and, in turn, they are driving Council members' decisions to embrace these technologies at a fast pace to stay relevant in the coming years.

Customers are increasingly expecting their interactions with banks to be on par with technology companies in terms of simplicity, ease of use, and speed. With increased digital adoption amid the pandemic, customer expectations have only heightened. For example, during the pandemic, Amazon—with its one-click ordering and fast Prime delivery—saw orders increase by 44% year-over-year. These service offerings

have wide-ranging effects on the decision-making within Council members' banks, including accelerating investments in digital capabilities, attracting and retaining digital talent, and using partnerships to bring new products and services into their ecosystems.

First, Council members' banks are prioritizing investment in technologies in order to deliver a seamless client-facing experience that is robust and unique, especially when it comes to customers' mobile banking experiences. Council members noted that the goal to improve customer experience is what is driving decisions to explore and apply new technologies (rather than technologies driving the decision-making). Although mobile banking is not a new technology, it is now the predominant channel of customer interactions by volume, and mobile user experience is increasingly becoming a differentiator. To improve the user experience, banks are looking to technologies such as AI and machine learning (ML) as means to provide value-added services—such as 24/7 assistance via chatbots and tailored ML-driven offerings—in the easiest and most stress-free manner possible. In addition to improving the customer experience, such technologies can also improve the employee experience and operating efficiency, with AI increasing the capacity of our knowledge workers to spend more time on value-adding activities. Also, by embracing technologies such as AI and ML, banks can make more informed credit, business, and strategic decisions; optimize back-office operations for precision and cost efficiency; reduce compliance and operational risks; provide personalized customer experiences; and transform business functions, resulting in significant cost savings.

Second, technological change is also impacting banks' decisions on the recruitment and retention of talent. Banks not only must compete to acquire and retain talent with local financial institutions, fintechs, and—in certain areas—non-financial services companies, they now face nationwide competition from companies offering remote work opportunities. This competition has placed upward pressure on salary and benefits packages. Because the pandemic has accelerated bank implementation of new technologies and customer use of that technology, there is a greater need for all bank employees to acquire and have deeper technology skills. For example, frontline bank employees now need to be able to explain how to make a remote deposit and help customers troubleshoot technology-related problems. As banks replace legacy systems and introduce new technologies, Council members noted that their organizations and cultures will also need to evolve, empowering teams by adopting methodologies (such as Agile) to enable faster, iterative delivery of customer-centered solutions.

Finally, because some banks may not yet have all the requisite resources or expertise to develop these new technology systems and service offerings internally, Council members continue to see more banks form partnerships with third-party fintech companies to give them rapid access to new technology offerings and capabilities. This presents a significant change in how banks manage their technology, going from vendor-owned core banking solutions to an in-house architecture that is open and interoperable along with API-first cloud solutions. This is especially the case in the critical customer-facing applications. These modern solutions have been designed from the ground up to provide scale and efficiency—relying on open-source technologies where possible—and the deployment of this open architecture allows for a seamless integration of new solutions into an organization's application stack. This new approach also provides motivation for traditional core providers to modernize their platforms to keep pace with this new “plug and play” architecture.

As banks continue to consider consolidation as a means to achieve scale and efficiency, mergers and acquisitions (M&A) can provide an opportunity to compete effectively by enabling greater synergies and rapid redeployment of capital into new technologies. Council members also anticipate that the evaluation of potential deals by both buyers and sellers will be greatly influenced by the technological capabilities of each organization, and that the bank with the most modern, flexible technology capabilities will most often be the surviving entity in an M&A transaction.

### **Panel #3**

**How are new technologies changing the risk exposures of Council members' institutions? What specific actions are Council members taking to manage these exposures?**

*Among the topics to consider:*

- *Operational risks associated with cyberattacks on the institution itself, its providers and partners, or its customers*
- *Reputational risk with customers, investors, community members, or policymakers due to technological "glitches"*
- *Financial risks associated with instability in the value of new instruments*

### **Strategic Risks**

Technology is no longer a “nice to have” in the banking industry—it is fundamental to its survival. With the growth of new technologies across the financial services sector and in related industries, customers continue to expect rapid integration of new products, services, and user-friendly delivery models.

New market entrants in the form of fintechs and large technology companies, which often face fewer regulatory hurdles and less oversight, are increasingly utilizing fresh technology stacks and easy-to-use interfaces to gain an expanding foothold into the wallets of consumers and small businesses. To compete, banks must continually invest in new toolsets and adapt business models to meet customer demands while maintaining a high level of information security and operational excellence. Banks continue to invest billions of dollars to modernize technology, but an effective response to new non-bank “digital intermediaries” also requires industry collaboration to provide new products, services, and technologies—such as Zelle, RTP, and Akoya—that can achieve the network effects critical to competing in the new environment.

To address revenue vulnerabilities and the risk of disintermediation, banks are also investing in new technology companies and experts to create opportunities to interact with and learn from new technologies. Examples include investing in fintech companies, hiring outside technology experts to advise executive leadership and the board of directors, and creating controlled environments where new technologies can be methodically introduced and tested. These initiatives allow for proof of concept, beta testing, and the spreading of learnings throughout the organization.

## **Cyber-Attacks**

Cyber-attacks that lock up or leak customer data present significant operational and reputational risks for financial institutions and their suppliers and clients. While companies implement defensive measures and response plans, cyber-attacks continue to evolve rapidly in sophistication and scope. The expanding ransomware threat landscape is being fueled by ransomware-as-a-service and the use of cryptocurrency. Attackers are also using double-extortion strategies in which, instead of encrypting the data in place, attackers are stealing the data and threatening to release it if a ransom is not paid. The severity of the attacks increases with the growing reliance on connected devices, remote workers, digital business models, and the global supply chain.

According to a report from Cybersecurity Ventures, global cybercrime costs could grow to \$10.5 trillion annually by 2025, up from \$3 trillion in 2015. The ongoing success and near-impunity of these attackers creates a negative feedback loop that is likely to lead to a continual increase in attacks.

## **Third-Party Risk**

Adversaries are also targeting third or fourth parties (such as software vendors, data aggregators, and cloud service providers) that provide services to broad swaths of the industry, greatly increasing the potential impact of a successful intrusion and calling into question the integrity of the technology hardware supply chain itself.

The growing role of cloud services in various forms (for example, software as a service, platform as a service, and infrastructure as a service) and how best to achieve resilience, security, privacy, transparency, and oversight, are key areas of focus as these services grow in scale and adoption. Although the cloud provides dynamic capacity to achieve resilience and scale to meet customer demands, it also poses risks. Risk mitigation measures include automation of cloud configuration, software deployments, and security scanning as well as monitoring activities between users and SaaS tools such as Slack and Teams to prevent accidental or malicious sharing of sensitive information. Institutions are also expanding their internal audit scope to include reviews of cloud computing.

Many institutions have adopted the use of open-source software (OSS) and contribute code back to the open-source community. An increasing number of bad actors have been using open-source software as a channel to inject malicious software. Risks are mitigated through a number of techniques: (1) creating an approved repository of OSS to prevent engineers from downloading packages directly from third parties, (2) scanning the software in the repository for threats, (3) scanning all software built using OSS for vulnerabilities, (4) including terms in third-party agreements regarding their use and protections for OSS, and (5) scanning third-party software for vulnerabilities.

Payment aggregators, which hold vast quantities of consumer data, represent another threat to financial institutions. Council members report using software to protect customer data by creating secure, customer-permissioned sharing of financial information directly with financial apps, thereby eliminating the need for “screen scraping” and its concomitant threats to account security.

## **Operational Outages**

Operational outages, or “glitches,” are another source of significant reputational and operational risks for financial institutions, regardless of whether the outages are emanating from the institution itself or from a third party. Social media outlets provide for a rapid and very public amplification of issues that can create the impression (valid or not) that an outage is the result of a cyber-attack.

## **Prevention, Detection, and Response**

Council members are employing a wide range of additional preventive measures to mitigate risks of cyber-attacks and other security or operational threats:

- Increasing resources (headcount and tools) in their information security and fraud departments

- Centralizing the solution architect function and embedding security-aware architects into all significant development efforts to understand and model threats as new solutions are evaluated, selected, designed, and implemented
- Compartmentalizing access at multiple layers of the ecosystem to ensure employees and partners have limited access and that networks are segmented for containment
- Identifying process owners for all technical operational processes to help identify risks, implement controls, and identify and champion continuing improvement across the organization
- Developing and fostering a culture where it is safe to raise issues to encourage self-identification
- Implementing zero-trust environments to minimize lateral movement of hackers and continuously monitor and challenge device and entity access
- Enhancing vendor due diligence and strengthening contractual language, with the most scrutiny applied to vendors supporting customer transactions. Existing vendors are also evaluated as part of ongoing reviews commensurate with risk levels. Key vendors undergo perpetual monitoring for cyber threats.
- Strengthening and consolidating technology controls for new account opening and customer authentication
- Participating in industry-led initiatives (for example, Analysis and Resilience Center for System Risk and Sheltered Harbor) to address industry-wide challenges and systemic risks

In addition to prevention, institutions are also investing in detection and response capabilities:

- Monitoring intelligence sources for indicators of compromise to other firms and relevant entities. When a potential compromise is identified, institutions take action to block connections and engage the third party (customer or vendor) to protect the company and, as appropriate, to help the third party.
- Working collaboratively with regulators and other government partners to better understand how firm-provided sensitive data is protected when held on government systems, and to ensure timely notification when such data may be impacted by a cyber incident (for example, the SolarWinds attack).
- Expanding training and education in every level of the company to demystify cybersecurity operations and raise awareness of the risks associated with cyber threats. Associates in higher risk functions may undergo specialized training.
- Engaging with customers to address security concerns and elevate awareness
- Expanding communication channels (for example, websites, electronic banking systems, emails, text messages) with customers to strengthen incident prevention, detection, and response procedures
- Enhancing business continuity plans and crisis management programs to address heightened risks of cyber-attacks
- Developing technical solutions to restore relevant systems and applications for customers in the event of an outage or incident
- Preparing executives and boards for decisions such as how to handle ransom demands
- Regularly simulating current attack patterns (tactics, techniques, and procedures) to test preventive, detective, and responsive controls

To prioritize risk-mitigation efforts based on annual loss expectancy, some institutions are leveraging the FAIR (Factor Analysis of Information Risk) methodology. The FAIR process considers the value of an asset if breached, the vulnerabilities associated with the asset, and the threat capability required to breach it.

## **Crypto-Assets**

Council members noted a strong need for market participants and supervisors to develop a broad, common understanding of key features of crypto-assets and blockchain technologies, as well as the principal risks they present, as the basis for prudential treatment of those assets. The overall stability of the global financial system will benefit from the transparency that will result from conducting a significant share of the crypto-asset market through supervised financial institutions, as opposed to being driven outside the banking system. At the same time, there are concerns about the preemption of technological innovation by overly prescriptive rules that cannot be adjusted quickly enough to keep up with the rapid pace of technological evolution. Inflexibility could constrict financial inclusion and other benefits of emerging technology.

Council members have been proactive in seeking education on crypto-assets and blockchain technologies at the board and management levels, although current and planned adoption of these products (for example, as collateral, bank assets, or offerings) varies widely.