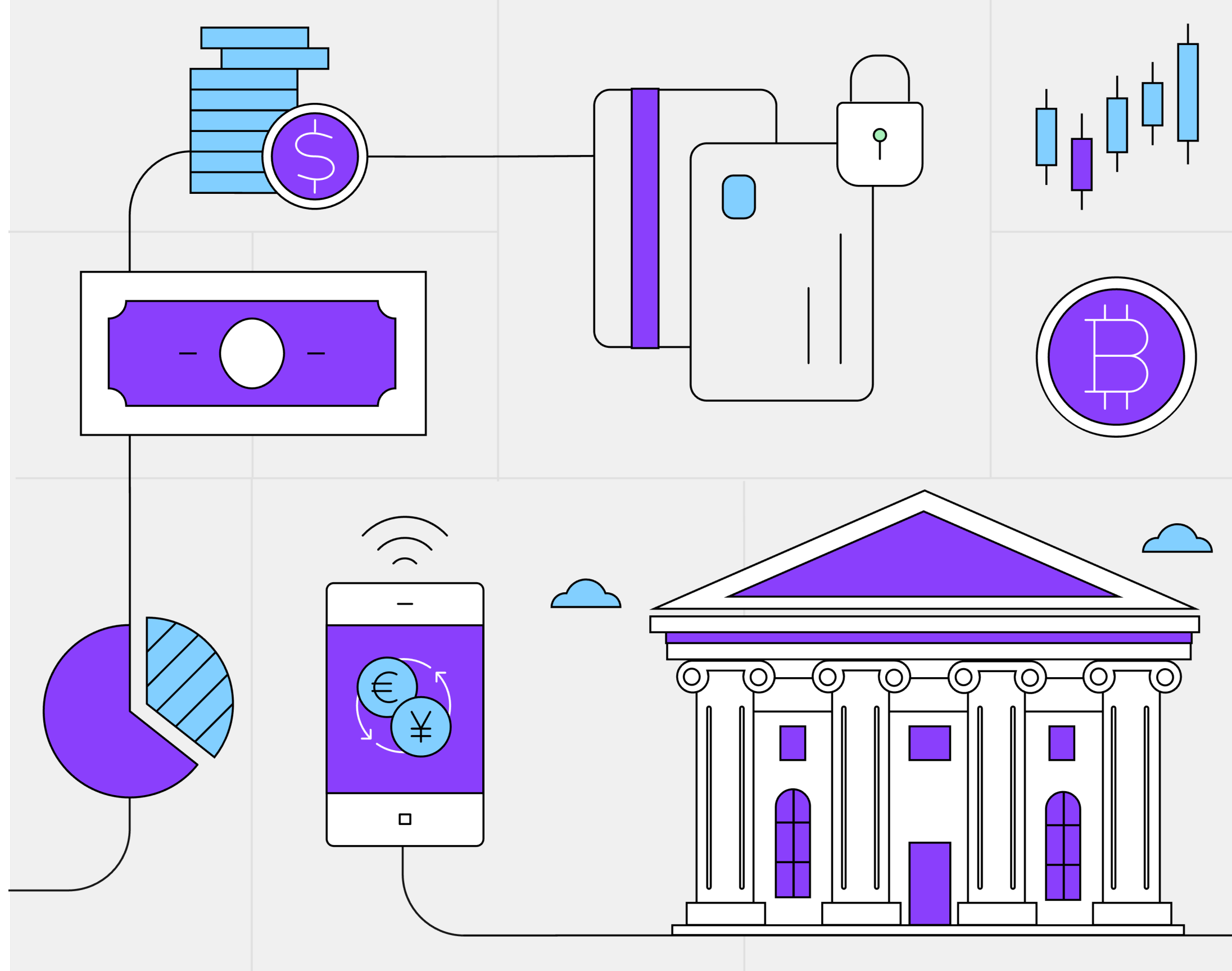


Industry  IQ

Banking & Financial Markets

November 2023





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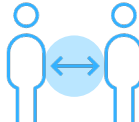

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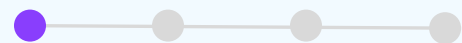


References for each slide can be found in the speaker's notes as well as at the end of the presentation.

Banking & Financial Markets Primer

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Industry definition & activities



Banking and Financial Markets are often overlapping concepts. The distinction here presented is adopted by IBM.

Banking institutions

Banking institutions primarily focus on intermediation of financial contracts. This involves accepting deposits, lending (e.g., personal or corporate lending, mortgages), processing payments, selling financial contracts to retail and affluent clients.

Primary Revenue Streams

Interest rate margins

the difference earned between the interest rate at which banks lend and the rate they pay on deposits.

Fees

charges paid by customers for specific financial services. For example, clients pay fees for card transactions and direct money transfers, as well as buying investment products.

Financial Market institutions

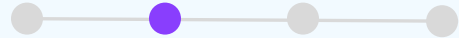
Financial Market institutions do not have a banking license for deposit taking and lending activities. They assist issuers of financial products (e.g., corporates, governments, other banks) to receive capital from to investors (e.g., families, pension funds, investment funds, hedge funds) and manage financial risks.

Primary Revenue Streams

Fees

charges paid by customers for specific financial services. For example, institutional and corporate clients pay fees for issuing investment products, buying investment products, receiving M&A advice.

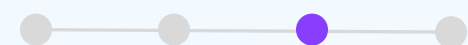
Industry definition & activities



Banking

Player	Primary Purpose	Examples	Activities
Retail Banks	They provide financial services to individuals and small businesses.	Retail banking at JPMorgan Chase, BBVA, DBS, Mizuho, Ally Bank, Navy Federal Credit Union, Chime	<ul style="list-style-type: none"> – Deposits and Savings – Loans and Credit Services – Investment products
Wholesale Banks	They provide financial services to governments, large corporations, and other financial institutions.	Corporate banking at Citi, HSBC, BBVA, Unicredit, DBS.	<ul style="list-style-type: none"> – Corporate Financing – Treasury Services – M&A Advice – Trade Finance
Payment Providers	They facilitate transactions and money transfers between individuals and businesses.	Amex, Mastercard, PayPal, Nexi, Paytm, Square, Stripe.	<ul style="list-style-type: none"> – Payment Processing – Money Transfer – POS Solutions

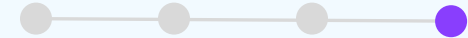
Industry definition & activities



Financial Markets

Player	Primary Purpose	Examples	Activities
Investment Management	They sell investment funds or manage investment portfolios on behalf of other firms.	BlackRock, Vanguard, Amundi, Blackstone, Bridgewater Associates	<ul style="list-style-type: none"> – Portfolio Management – Asset Allocation – Risk Management
Wealth Management	They provide financial advice and services to high-net-worth individuals and families.	Morgan Stanley Wealth Management, UBS Wealth Management, Goldman Sachs Private Wealth Management, J.P. Morgan Private Bank	<ul style="list-style-type: none"> – Financial Planning – Advisory Services – Estate Planning – Charitable Giving
Exchanges	They provide a platform for buying and selling of financial instruments like stocks, bonds, and commodities.	New York Stock Exchange (NYSE), NASDAQ, Chicago Mercantile Exchange (CME), London Metal Exchange (LME)	<ul style="list-style-type: none"> – Trading Platform Operations – Listing Services – Regulatory Compliance
Investment Banks and Capital Market firms	They provide services such as trading and market making, advice for mergers and acquisitions (M&A), capital raising.	Goldman Sachs Investment Banking, J.P. Morgan M&A Advisory, Morgan Stanley Corporate Finance, Barclays Investment Bank	<ul style="list-style-type: none"> – Corporate Finance – Advisory Services – Underwriting – Sales and Trading – Research and Analysis

Industry definition & activities



Regulators and other institutions

Player	Primary Purpose	Examples	Activities
Central banks	They are responsible for overseeing monetary policies (e.g. interest rate setting), managing inflation, and money supply.	Federal Reserve (USA), European Central Bank (ECB), Bank of Japan (BOJ), Bank of England (BoE), Bank of China (BOC)	<ul style="list-style-type: none"> – Currency Issuance – Reserve Management – Monetary Policy Formulation
Regulatory Authorities	They enforce financial laws and oversee regulations to ensure market integrity and protect consumers.	U.S. Securities and Exchange Commission (SEC), Financial Conduct Authority (FCA) (UK), Australian Prudential Regulation Authority (APRA), China Banking Regulatory Commission (CBRC)	<ul style="list-style-type: none"> – Bank prudential supervision – Market surveillance – Investors' protection – Compliance oversight – Regulation setting and enforcement
Technology Services	This includes software applications, networks, and platforms that provide essential functions common to all banks.	FIS, FINASTRA, Thought Machine (vault), Broadridge	<ul style="list-style-type: none"> – Core Banking Solutions – Payments Networks – Data Security – Risk Management – etc.

Industry overview

Industry Dynamics

[Macroeconomic indicators](#)

- Spiking inflation, bottoming / rising interest rates, reversal of monetary policies.
- Higher rates strain businesses' appetite to borrow and diminishes bond values.

[Geopolitical uncertainties](#)

- Heightening financial risk across geographies and economic sectors impact customer needs and test value chains.

[New competition](#)

- Clients' digital adoption is intercepted by new players such as digital platforms, confining the operating space for traditional financial institutions.

[Evolving risk, compliance, and regulations](#)

- Cybersecurity and cyber-resilience are challenged by tech-advanced rogue players.
- Increasing risk of ecosystem vitality due to digital connectivity.

Industry Trends

[Business model innovation](#)

- Digital business models expand beyond banking.
- Business and IT collaboration is mission critical for flexible and agile business models to succeed.

[Core modernization and optimization](#)

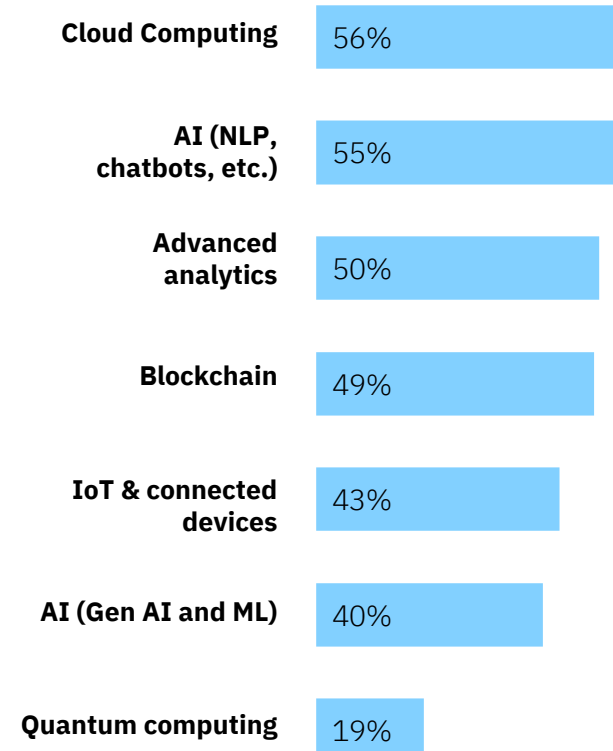
- Prioritize cost reduction and modernization to build healthier operating models.
- Realize efficiency gains from investments in cloud, data, and AI transforming ways of working.

[Sustainability](#)

- Integrate sustainability into bank business strategies and operations.
- Structure suitability-related products and selling to clients.

Technologies

[2023 CEO study](#): Technologies expected to deliver results in banking and financial markets over the next three years¹



Strategic Imperatives

[Prioritize growth and performance](#)

- Digital capabilities for operational resilience leads to healthier financial performance.
- Engage ecosystem of partners and reset operating models on flexible architectures.
- Align organizational incentives on value delivered with digital strategy execution.

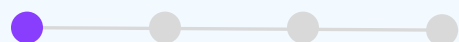
[Rethink cost and efficiency](#)

- Employ cloud techniques to improve the performance of critical value streams.
- Reduce the skills gap.
- Embrace an entrepreneurial mindset.

[Navigating the ESG conundrum](#)

- Enhance ESG reporting and data governance to meet regulatory requirements.
- Share ESG performance with employees, customers, and stakeholders to boost reputation.

Industry dynamics



Macroeconomic indicators

The rising interest rates, spiking inflation, shift in monetary policies, and recessionary fears have significant impact on banking revenue and the performance of financial markets.

- The aftermath of COVID-19 pandemic and recent military escalations have caused global inflation spikes, leading governments to raise interest rates¹.
- Raising interest rates leads to increased cost of borrowing, making businesses and citizens to rethink investments decisions, thereby taming inflation.
- Federal Reserve, the central bank of US, raised interest rates [11 times](#) between March 2022 to September 2023, invoking recessionary fears among businesses.²
- For banks, higher interest rates reduce the demand for lending activity while it widens net interest margins ([NIM](#)) until deposit rates are reset. The value of bonds held gets lower, adding regulatory pressure to maintain additional capital reserve (E.g., [CET1](#)).³
- For financial markets, higher interest rates tend to introduce higher price volatilities on capital markets.

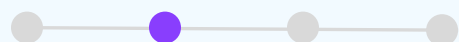
9.1%

US CPI Inflation in June 2022, a 40-year high and well above the historically aimed target of 2%⁴

Related IBM publications for more insights:

- [2023 Global Outlook for Banking and Financial Markets](#)

Industry dynamics



Geopolitical uncertainties

Economic rivalry and deglobalization induced by geopolitical tensions impact the global financial stability. This affects the cross-border allocation of capital, the reliability of international payment systems (e.g., sanctions), and the dynamics of asset prices.

- Geopolitical tensions may abruptly reverse capital flows, impacting emerging economies more than advanced ones.⁵
- Military escalations may continue for an extended period, impacting the economic competitiveness of whole countries and beyond.
- The business and commercial competition between two largest global economic powers—the US and China—could continue impacting investments and trade.
- The shift from collaboration to open competition has been recognized worldwide and is causing the delicate repositioning of established strategies.
- Governments are exploring deglobalization strategies to protect their economies from geopolitical risks, resulting in overall increase in prices and supply chain inefficiencies.⁶

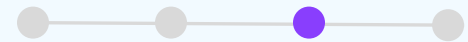
15%

reduction in the overall bilateral cross-border allocation of portfolio investment and bank claims when tensions escalate between an investing and a recipient country, as seen in the case of the United States and China since 2016⁷

Related IBM publications for more insights:

- [2023 Global Outlook for Banking and Financial Markets](#)

Industry dynamics



New competition

The accelerating digital adoption of customers has been intercepted by more agile and tech-advanced competitors, challenging traditional financial institutions.

- The pandemic made customers more accustomed to digital financial services, exposing the shortcomings of traditional business propositions.
- Across all ages and markets, nearly [80%](#) of customers favor online access for virtually all basic transactions. And [16%](#) are already comfortable with a branchless, fully digital proposition to deposit their salary.⁸
- Incumbents are hindered by legacy IT and business models that are not modular.
- The new competitors are a mix of fintech startups and “techfin” organizations (technology companies in financial arena) that woo clients with a better customer experience at a lower cost.⁹
- Offering a better client experience is inextricably linked with offering a better employee experience. With more digital competitors wooing top talent, banks need to address the human side of operating models as part of a combined automation and augmentation effort.¹⁰

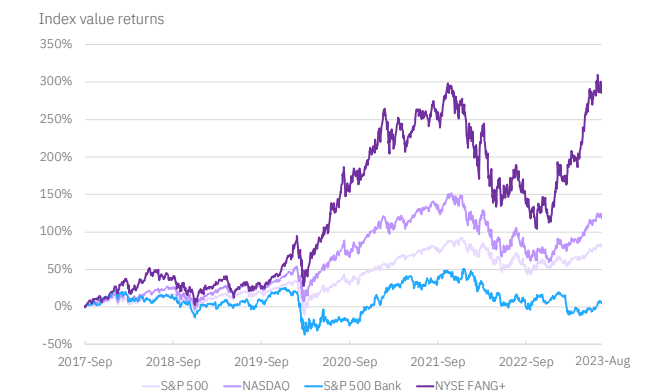
Related IBM publications for more insights:

- [2023 Global Outlook for Banking and Financial Markets](#)
- [Embedded finance: Creating the everywhere, everyday bank](#)

300

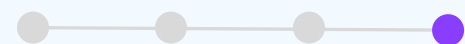
approximate number of digital-first banks existing worldwide^{[11](#)}

The rise of the platform economy¹²



Technology and tech enabled companies consistently outperform their peers

Industry dynamics



Evolving risk, compliance, and regulations

Embracing exponential technologies, new digital channels and ecosystems, along with innovative financial services like open banking and decentralized finance (DeFi), is making traditional practices for risk and compliance insufficient for digital future.

- Financial institutions are realizing that risk awareness pays off and are viewing security investments as revenue enablers that improve operational resilience.
- [58%](#) of banking and financial markets CEOs consider cybersecurity and data privacy among their top three priorities over the next three years.¹⁴
- Holistic strategies to share and integrate customer data across security functions, to predict and respond proactively are essential in evolving risk landscape.
- Shared resilience model, that enables multilateral coordination among ecosystem partners, reduces risk, and enables openness and value creation is gaining traction.
- New regulatory requirements such as the upcoming [Digital Operational Resilience Act](#) (DORA) in the European Union also focuses on operational resilience to counter evolving risks in the digital era.¹⁶
- Reliance on cloud hyper-scalers and growth in novel interdependencies prompt concerns of industry-wide operational stability.

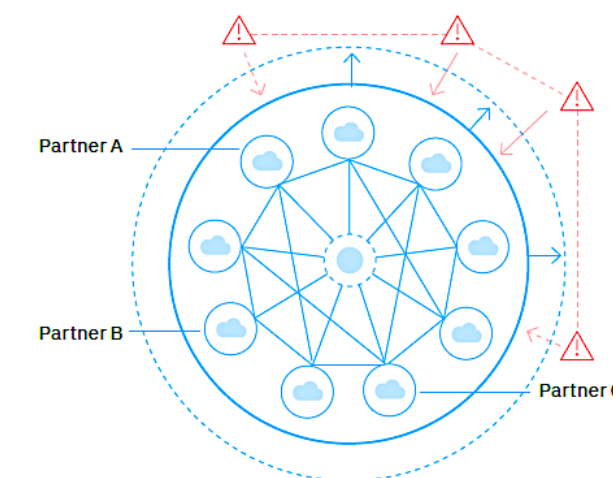
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2000

CIOs and CTOs of financial institutions globally defined “unified security frameworks”—spanning cyber risk to compliance postures—as their top priority to generate greater business value in the next three years¹³

Shared Resilience Model¹⁵



Industry trends



Industry Trends are some of the observable changes that are reshaping banking and financial markets industry, in response to the dynamics.

Business model innovation

Large traditional institutions are hindered by less agile legacy business and operating models. Many of these models were designed in another era for another era, long before the emergence of agility enabled by exponential technologies.

- The distance between current business models and unexploited digital opportunities is reflected in dropping price-to-book ratio ([PBR](#)), stressed net interest margins ([NIM](#)), and poor return on average equity ([ROAE](#)).³
- Incumbents need to drive growth and performance in a sector rife with new, nimble, digital competitors who are rewriting the rules of engagement.
- Financial institutions should shift from siloed innovation within the confines of traditional industry definitions to a holistic strategy to rapidly create digital business models beyond banking, utilizing emerging technologies.
- Ecosystem platforms can multiply value when financial institutions focus on redesigning customer engagement, improving business and IT collaboration, and enable sharing data, insights, and capabilities with trusted partners.⁴
- Consumer industry, Manufacturing/Industrial products, Healthcare, Education, and Telecommunications are the areas where bankers see greatest potential to elevate their role.⁵

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- [2023 Global Outlook for Banking and Financial Markets](#)
- [Embedded finance: Creating the everywhere, everyday bank](#)

14.05% to 6.09%

drop in the median of the five-year average ROAE for the top 50 banks (by total assets) for major advanced economies (as defined by the International Monetary Fund) and EU member states¹

57%

of executives say banks can get the most value from directly orchestrating retail- or small-to-medium enterprise (SME)-oriented ecosystems.²

Industry trends



Core modernization and optimization

To build healthy and resilient operating models, leaders must address legacy architectures, costs, and business culture.

- Cost reduction and optimization is crucial to free capital for new investments, especially since cost-to-income ratio ([CIR](#)), which measure a bank's efficiency, remain underwhelming.
- Monolithic core banking architectures increase costs and delay the value that digitalization or consolidations could bring.⁶
- During cost and efficiency optimization initiatives, financial institutions should take a proactive and long-term approach that includes eliminating products that no longer align with firm's overarching strategy and redesigning processes using AI and automation.⁷
- A collaborative and long-term approach that enables financial institutions to realize cost and efficiency gains from their cloud, automation, and AI investments helps increase customer experience, return-on-equity ([ROE](#)), and reduce CIR.
- Total estimated technology spending in retail banking in 2022 is around [\\$250 billion](#).⁸
- Only [43%](#) of IT executives in the US say they have visibility into costs and consumption across their cloud environment, making bankers to realize the importance of involving business, IT, and other functions in cost and efficiency optimization initiatives.⁹

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- [2023 Global Outlook for Banking and Financial Markets](#)
- [Embedded finance: Creating the everywhere, everyday bank](#)

59%

Cost-to-income ratio (CIR) in major advanced economies and EU member states^{[10](#)}

47%

of banking and financial markets CEOs consider tech modernization among their top three priorities over the next three years^{[11](#)}

Industry trends



Sustainability

Environmental concerns have led to new, albeit necessary, restrictions on business and economic activities. While banks can be an integral part of the sustainability solution and find new revenue opportunities, they are also exposed to new risks and complex compliance requirements.

- Financial institutions hold the keys to unlocking sustainability within their own operations and across industries. [71%](#) executives state that ESG objectives are central to their business strategy.^{13,14}
- Issuing loans, bonds, or credit for sustainability products, offering rewards for purchase of sustainable goods using commercial cards, investing deposits in sustainable assets are a few ways for financial institutions to promote responsible finance practices.
- Exponential technologies like data, AI, and the cloud play a key role in measuring and embedding sustainability into standard operations, contributing to sustainability goals.
- Advanced analytics, automation, and cloud are the top three technologies that financial institutions use to advance in ESG.¹⁵
- [42%](#) executives in financial institutions state inadequate data as biggest challenge in achieving sustainability objectives, and technology play a key role in solving the same.¹⁶

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\$1525 B

global sustainable debt issuance in 2022 in the form of green bond, sustainability bond, sustainability linked loan, and many more¹²

Technologies

Artificial intelligence



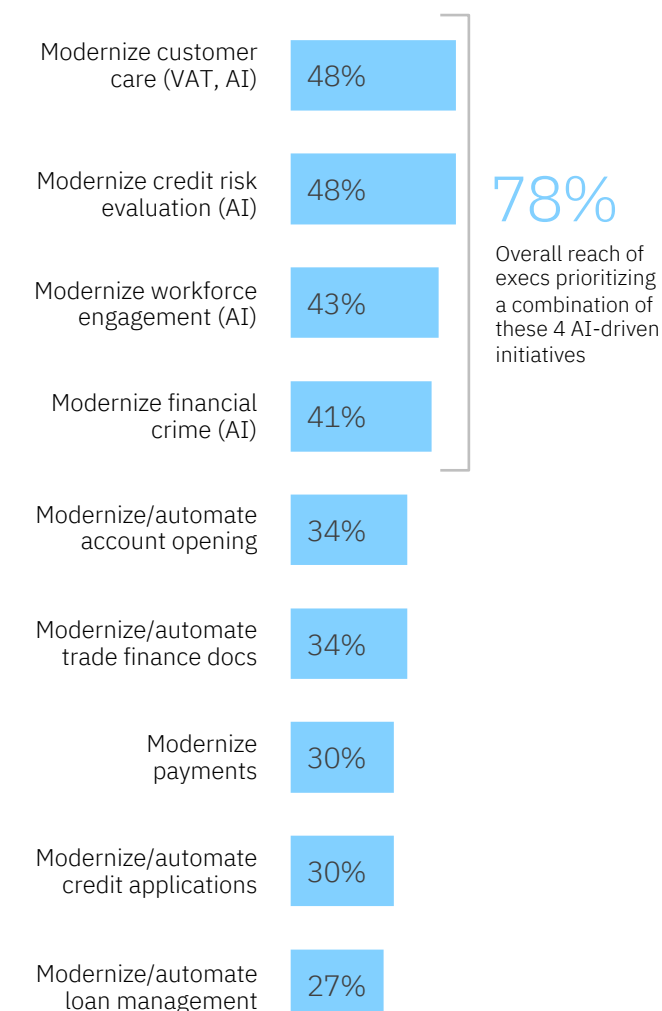
Related IBM publications for more insights:

- [Foundations of banking excellence](#)
- [Generative AI: “State of the Enterprise Market”](#)

Financial services landscape is rapidly evolving, pushing financial institutions to embrace AI and advanced analytics to stay competitive.

- Traditional AI and advanced analytics can help financial institutions in fraud detection, automation, risk assessment, optimizing investment portfolios, and deriving insights from customer, operations and network data.
- Generative AI can transform customer experience by enabling personalized and simplified interactions through virtual agents or chatbots across multiple channels.
- Human resources, ESG, risk and compliance, and cybersecurity are few additional areas where AI and advanced analytics would play a key role in reducing costs and improving efficiency.
- AI introduces new risks associated with the use of algorithms, including ethical concerns. To address these issues, most organizations are establishing a governance structure that includes policies and standards.

[Click here to go to Generative AI section in appendices](#)



Overall reach of bankers recognize the role of AI in prioritizing a combination of these four end to end modernization initiatives¹

Technologies

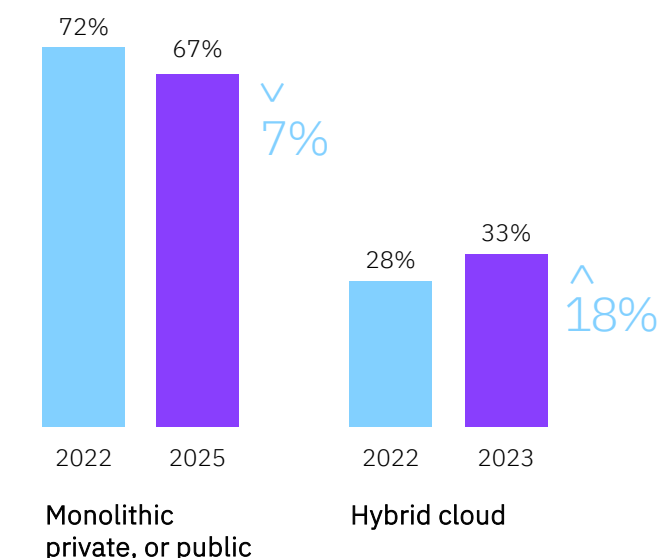
Hybrid cloud



Hybrid cloud is a “must have” for transforming of financial institutions’ business architectures from monolithic, inflexible, complex, and expensive setups to open, modular, agile, and automated design.³

- Bank executives anticipate an upward trend towards hybrid cloud, which can help improve the languishing financial measures, cost-to-income ratio ([CIR](#)) and return on equity ([ROE](#)).⁴
- Mastering hybrid cloud means improving financial institutions’ cybersecurity posture, solves the architectural challenges related to scaling and partnerships, increases employee productivity, and optimizes IT costs.
- Embedding financial services into the user ecosystems of other industries using cloud speeds up the launch of customer-centric business models and enables interoperability of data among partners.
- [62%](#) of chief data officers in financial institutions are utilizing hybrid cloud to unlock value from data to a large extent.⁵

Bank executives anticipate an upward trend toward hybrid cloud²



Related IBM publications for more insights:

- [Foundations of banking excellence](#)
- [Mastering hybrid cloud](#)

Technologies

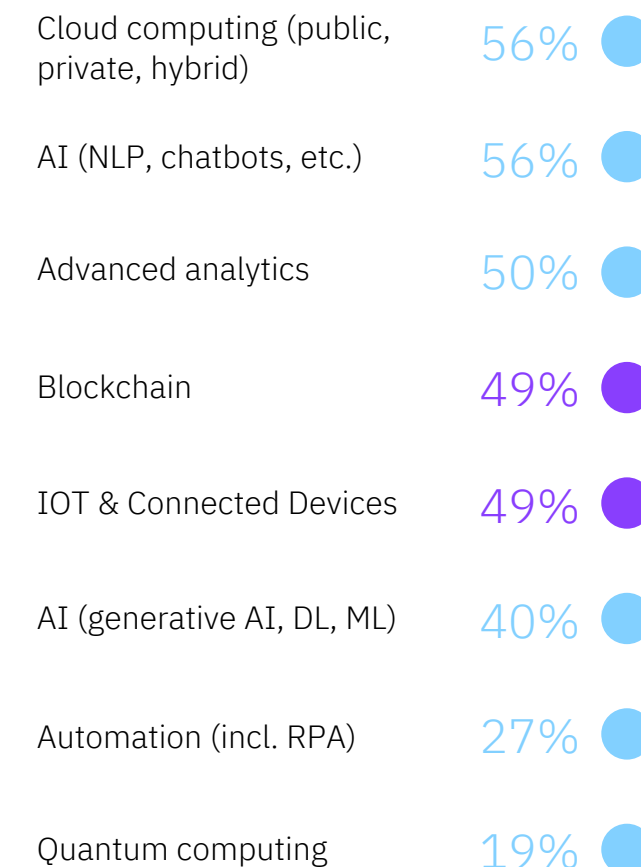
Blockchain & IoT



IoT generates valuable data but has security vulnerabilities, while blockchain offers strong security but needs extensive data. Combining them complements their strengths and weaknesses.

- Blockchain offers a secure, tamper-proof and immutable ledger, making it ideal for storing sensitive financial data, while promoting transparency.
- Blockchain provides financial institutions with benefits such as peer-to-peer cryptocurrency transfers, trust-enhancing smart contracts for lending and borrowing, cost optimization through the elimination of settlement and clearing, regulatory verifications, and faster cross-border payments.⁶
- [Swift](#) conducted experiments with ANZ, Citi, BNY, and several other banks to demonstrate blockchain interoperability, that is to connect multiple blockchains for movement of tokenized assets around the world is achievable.⁷
- IoT devices can collect real-time customer data and behavior patterns in ATMs and banks that can be utilized to optimize processes.
- Contactless NFC based payments through IoT devices, and providing better insights related to customer risk profile during lending activities are few more areas where IoT technology can help financial institutions.⁸

Technologies expected to help deliver results over the next three years⁹



Related IBM publications for more insights:

- [2023 Chief Executive Officer Study](#)

Technologies

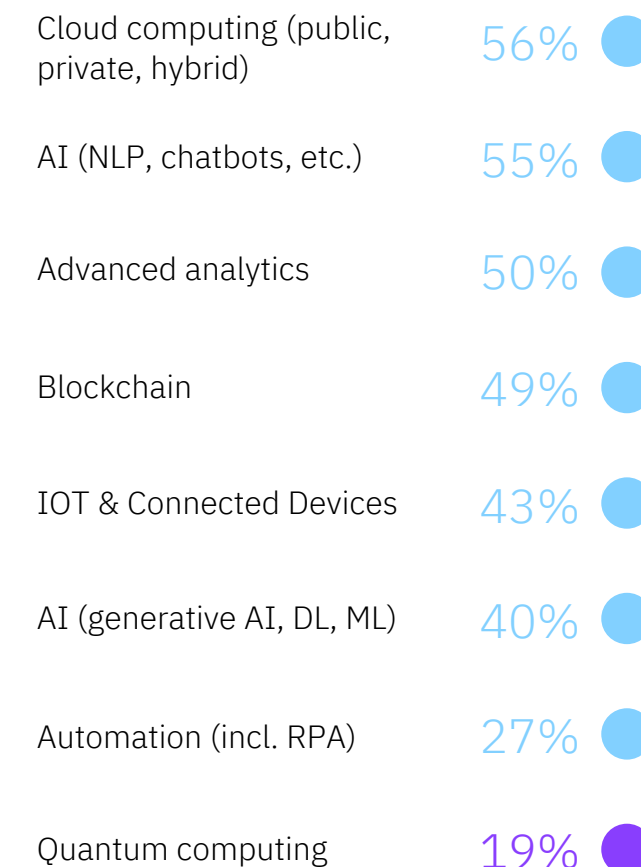
Quantum computing



Financial institutions are exploring quantum computing to enable calculations that are not possible with traditional computing technology.

- Quantum technology can help financial institutions in areas like portfolio diversification, fraud detection, investment risk analysis, pricing of options and derivatives, and analyzing customer behavioral patterns.^{10,11}
- Quantum-safe cryptography solutions can improve the security posture of data and networks for financial institutions.
- Financial institution leaders expect that, it may take [14 years](#) on average for quantum-safe cryptography to fully integrate into their business.¹²
- Inadequate quantum skills and the difficulty of integrating quantum technology into processes are the top two barriers that financial institutions face when adopting quantum computing.¹³

Technologies expected to help deliver results over the next three years¹⁴



Related IBM publications for more insights:

- [2023 Chief Executive Officer Study](#)
- [Exploring quantum computing use cases for financial services](#)

Technologies

Data architecture



Modern banking and financial markets depend on data collected from various sources to derive insights and make decisions, highlighting the importance of integrated data architecture.

- In an organization that provides end-to-end financial services, there could be data sources like customer information, transactions, investment portfolio, securities, compliance, ESG, and many more.
- Data mesh, data fabric, data lake, data warehouse, and many more data methodologies and approaches can help financial institutions handle diverse data and remove data silos.
- [79%](#) of banking and financial markets chief data officers state that data is central element of business innovation, and for [49%](#) data reliability is the most pressing data management challenge.¹⁵
- Financial institutions should prioritize interoperability, transparency, adherence to global standards, security, and alignment with business strategy when developing their data architecture.

Executives report the exfiltration, or theft, of sensitive data as a growing challenge as data volumes in financial institutions are increasing¹⁶

49%

Bankers state that data-oriented initiatives are expected to deliver the greatest value in the next three years¹⁷

Related IBM publications for more insights:

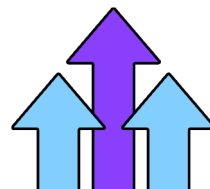
- [Foundations of banking excellence](#)

Strategic imperatives

The essential priorities guiding banking and financial institutions to achieve long-term goals and competitive advantage in their industry.

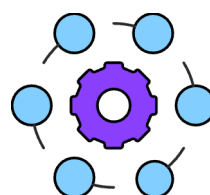
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Prioritize growth and performance



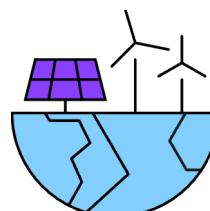
Growing competition from non-traditional financial firms and disappointing financial indicators are driving incumbent financial institutions to prioritize growth and performance. To foster innovation, they must go beyond digitizing existing models, with a focus on redesigning customer engagement and reshaping operating models into highly flexible architectures. This entails collaborating with ecosystem partners, incentivizing an agile, fail-fast-learn-fast mindset, and staying aligned with their overarching digital strategy.

Rethink cost and efficiency



Often, financial institutions focus narrowly on cost and efficiency initiatives, neglecting to integrate business, IT, and other functions into decision-making. To enhance results, these initiatives should follow a bottom-up approach rather than a top-down one. Additionally, monolithic and legacy architectures within financial institutions drive up costs, impede scalability, and hinder the realization of value from digital strategies. Institutions should modernize their core infrastructure using technologies like AI and hybrid cloud to boost scalability, resiliency, security, and to optimize costs and efficiency. Lastly, removing skill and knowledge gaps within the organization aligns financial institutions on a success trajectory.

Navigating the ESG conundrum



Regulatory pressures on financial institutions in ESG areas are increasing due to requirements like the Task Force on Climate-/Nature-related Financial Disclosures, European Central Bank climate risk stress test, and many more. Strengthening ESG reporting and data governance is crucial as inadequate data remains a top concern. Avoiding pitfalls like isolated operations, growing technical debt, and neglecting ESG integration into core processes is essential. Utilizing AI and hybrid cloud for ESG and sharing ESG performance with employees, customers, and stakeholders enhances financial institutions' reputation.

IBM

capabilities

Leveraging exponential technologies in an industry as complex as financial services requires a mature approach and thoughtful framework to mitigate risk and exposure.

Technologies like hybrid cloud and AI will change how the financial services industry helps customers, builds efficiency, and secures data, but there are important considerations to unpack.

IBM's hybrid cloud and AI capabilities help banks transition to new operating models, embrace digitalization and achieve continued profitability in a new era of banking.

Digital Core Systems for Banking

IBM's Digital Core Systems for Banking enables a Bank to progressively modernize core systems, delivering business outcomes while reinventing the application portfolio and positioning them for the future. The offering spans initial discovery and planning through execution of the modernization roadmap.

[Explore](#)

ISV Enabled Banking Transformation

ISV Enabled Banking Transformation combines packaged solutions from industry-leading ISV partners, IBM thought leadership, and proven integration patterns to develop and deploy strategies that decrease complexity, increase agility, and reduce costs.

[Explore](#)

Payments Transformation

The IBM Payments Center (IPC) provides end-to-end payment solutions to clients to help enable their payment system modernization process.

[Explore](#)

[More banking and financial markets offerings](#)

Appendices

Generative AI

Hybrid Cloud

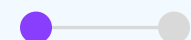
Cybersecurity

Open Innovation & Ecosystems

KPIs & Industry Benchmarks

Component Business Model

Generative AI



Executives' perspective on generative AI

In 2023, [82%](#) of banking and financial markets executives are familiar with generative AI, as ChatGPT has consumerized generative AI for the public and businesses.

Unlike in 2016, when executives didn't have a clear vision of where to deploy early-stage traditional AI, executives now have a clearer vision of where to deploy generative AI.

Top 3 barriers to generative AI adoption in banking and financial markets

Privacy (70%)

Cybersecurity (64%)

Regulation (42%)

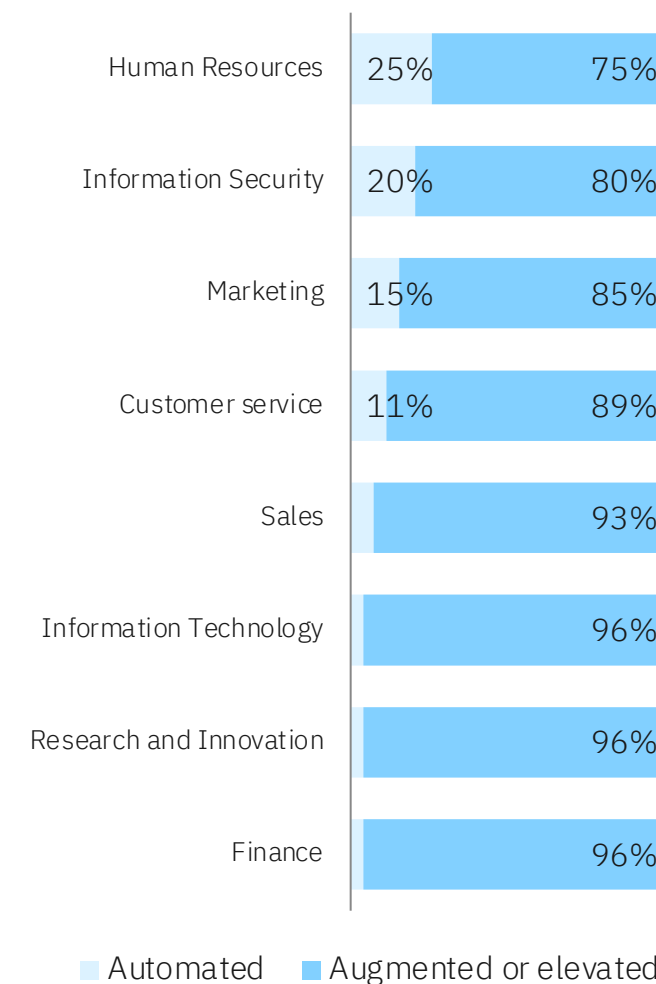
Top 5 benefits of adopting generative AI in banking and financial markets

- Enhance customer experience
- Competitive advantage
- Improve quality of content
- Scale employee expertise
- Improve decision making and accelerate client acquisition

Source: Generative AI: “State of the Enterprise Market”¹

Automation vs Augmentation:

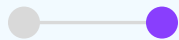
Banking and financial markets executives see more AI automation opportunities in HR, IT, customer service, and marketing over other areas.



Related IBM publications for more insights:

- [Generative AI: “State of the Enterprise Market”](#)

Generative AI



Related IBM publications for more insights:
– [Generative AI: “State of the Enterprise Market”](#)

Generative AI opportunities in banking and financial markets^{2,3,4}

Financial Document Processing and Synthesis:
Streamlining document processing by extracting and summarizing vital financial data from contracts, policies, credit memos, reports, and more to expedite report generation and data analysis.

Enhanced Virtual Assistants and Customer Service:
Empowering virtual assistants to handle unique financial customer inquiries, enhancing customer service and chatbot interactions, particularly for credit, transactions, and investments.

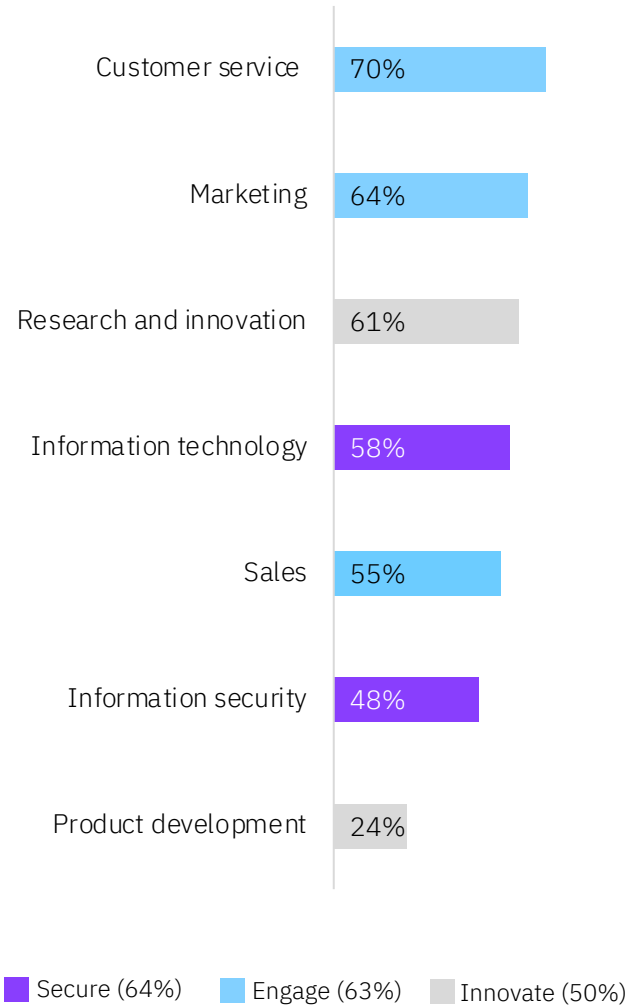
Capital Markets Research and Analysis:
Acting as a research assistant, swiftly identifying and summarizing key financial insights from documents such as event transcripts, earnings reports, company filings, and macroeconomic reports.

Regulatory Compliance and Code Change Assistance:
Assisting developers in understanding and implementing financial regulatory changes, automating coding modifications, and providing documentation for compliance with financial regulations and industry standards.

Personalized Financial Recommendations and Customer Engagement:
Creating personalized financial recommendations to enhance the customer experience, boost cross-sales, and provide tailored financial advice for investments, savings, and financial products.

Advanced Content Generation for Financial Professionals:
Facilitating financial professionals by automating content-related tasks and expediting the creation of financial reports, investment proposals, and software development documentation.

Generative AI priorities for banking and financial markets⁵



Hybrid cloud

Benefits of hybrid cloud for banking and financial markets

- **Scalability, security, and cost benefits:** Hybrid cloud reduces fixed expenses, freeing capital for business initiatives, and offers enhanced security and scalability without hefty in-house infrastructure investments.
- **Agility and customer experience:** Hybrid cloud boosts market agility, making it cost-effective for financial institutions to experiment with new strategies and recover swiftly from setbacks. Additionally, it simplifies processes and enables personalized customer experiences.
- **Ecosystem and partnerships:** Adoption of hybrid cloud promotes collaboration with stakeholders, enhancing financial institutions' capabilities to participate in digital ecosystems.
- **Bridging technology and data silos:** Hybrid cloud helps in seamlessly integrating exponential technologies like AI and advanced analytics into standard operations for core modernization and reduced siloed operations.
- **New revenue streams:** Opportunities to embed financial services into other industries expands through hybrid cloud, opening new revenue streams for financial institutions and improving financial metrics like CIR, ROAE.

3.4 years Expected number of years required for banking and financial markets to realize a cloud strategy¹

Room for improvement on hybrid cloud²

Clearly, many banking executives state that banks have an opportunity to advance on two areas concerning hybrid cloud:

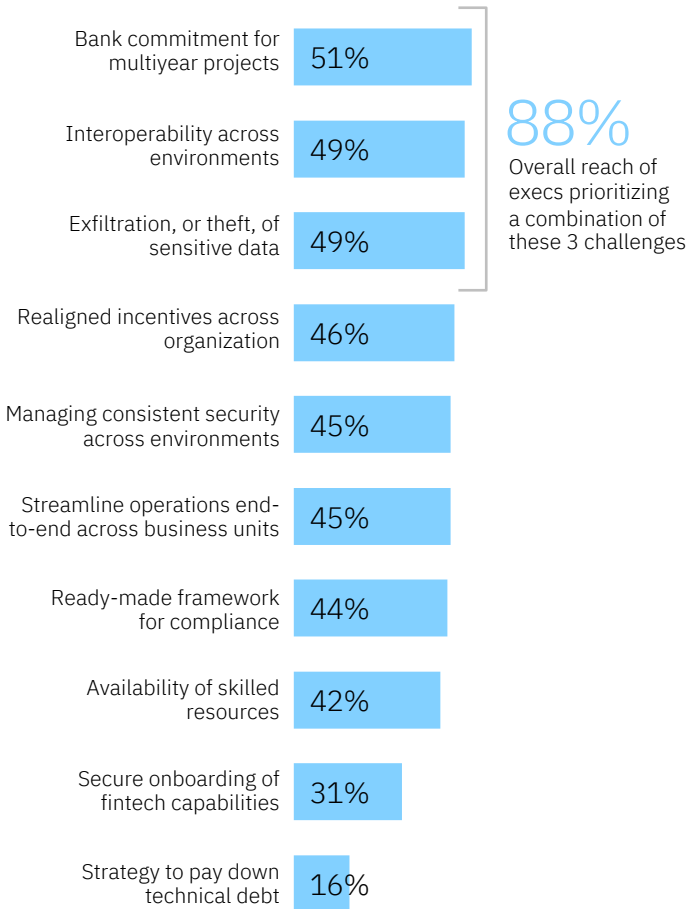
- Automated deployment of containers and cloud-native apps
- Extensive containerization with advanced use of microservices

However, the hurdles to adopting hybrid cloud are stopping banks from realizing its full value.

Almost
9 in 10

banking executives report common challenges³

Hurdles to hybrid cloud



Related IBM publications for more insights:

- [Foundations of banking excellence](#)
- [Mastering hybrid cloud](#)

Cybersecurity

While new business and operating models are creating innovative ways to serve customers anywhere and anytime, they are also creating new opportunities for security breaches.

- **Aging infrastructure:** Legacy and monolithic systems widen security gaps, prompting financial institutions to prioritize cybersecurity
- **Open and expanding ecosystem:** Predict, prevent, and respond to modern threats, increasing business resilience
- **Sensitive information:** Rising fraud and cyberattacks heightens need to protect data, identities and workloads across the hybrid cloud environments
- **Regulatory compliance:** The next systemic crisis might not be about finance but operational. Banks focus on improving the effectiveness and resilience of security programs

How financial institutions are responding to vulnerabilities?

Financial institutions are revisiting their enterprise risk profile and deploying enhanced security capabilities within their walls and across their ecosystems. Geo-political instability is heightening risks of mass scale attacks, while interest for quantum-resistant cryptography gains momentum.

#1 investment priority

to generate business value for CIOs/CTOs is a unified security and compliance control framework¹

Frameworks and models such as zero trust, security-by-design, DevSecOps, and shared responsibility model are gaining traction.

Related IBM publications for more insights:

- [Security, the cost of data breaches, and AI for Banking and Financial Markets](#)
- [Cost of a data breach report 2023](#)

Banks technology-led initiatives are focused on “building blocks” toward hybrid cloud

45%

prioritize a unified security and control framework²

Open innovation & ecosystems

How financial institutions are entering into ecosystems?

Financial institutions are expanding into wider range of industries like consumer products, healthcare, education, and many others to embed financial services with APIs. However, incumbents are taking a two-pronged approach towards ecosystems and platform business models

1. Joining existing platform orchestrators to prevent commoditization and source insights to develop new products and services.
2. Creating their own interconnected ecosystems in specific markets, using their unique strengths to offer tailored services.

The role of open innovation:

Regulatory and customer pressure to improve financial inclusion and convenience are driving financial institutions towards partnerships and open innovation.

Enhanced customer experience, access to new markets and technologies, optimized costs, and improved competitiveness are a few benefits of open innovation.

Open banking is a safe, secure modular interaction framework that allow users to share their financial data with trusted third parties, will enable these ecosystems to succeed.

Recently, European union has proposed Third Payment Service Directive (PSD 3), that improves functioning of open banking (a form of open innovation) and enhances control to citizens over data access.¹

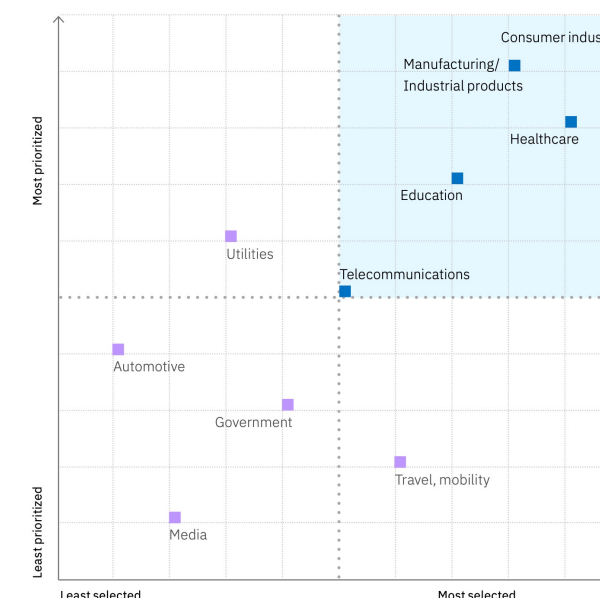
API Marketplaces, collaboration with fintech start-ups, and accelerator programs are few other ways through which financial institutions are leveraging open innovation.

Related IBM publications for more insights:

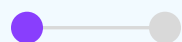
- [Embedded finance: Creating the everywhere, everyday bank](#)

Top 5 non-financial ecosystems that seem promising for financial institutions²

- 1 Consumer industry
- 2 Manufacturing/Industrial products
- 3 Healthcare
- 4 Education
- 5 Telecommunications



KPIs & industry benchmarks



Key Performance Indicators (KPIs) are high level metrics used to gauge a quantifiable component of an organization's performance that is of strategic importance and aligns with operational objectives.

Related IBM publications for more insights:

- [State of the union in banking](#)

Profitability and efficiency indicators

- **Return on Average Equity (ROAE %)** measures performance based on the average shareholders' equity. [Net Income / Average Equity Value between year start and end].
- **Cost Income Ratio (CIR %)** measures a bank's efficiency. [Operating Expense / Operating Income].
- **Net Interest Margin (NIM %)** measures a bank profitability from credit operations (e.g., interest earned from loans and mortgages less interest paid to saving account holders). [Net Interest Income / Total Assets].

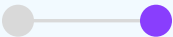
Market indicators

- **Price to Book Ratio (PBR)** measures the market capitalization relative to book value. Firms with PBR much lower than 1 are typically distressed. [Stock Price per share / Book Value per share].

Regulatory indicators

- **Common Equity Tier 1 ratio (CET1 %)** determine the ability to withstand financial distress measuring the amount of core equity assets (highest quality portion of Tier 1 capital, such as common shares and retained earnings). CET1 capital is meant to absorb losses immediately when they occur and must be higher than a minimum required. [Common Equity Tier 1 / RWA].
- **Liquidity Coverage Ratio (LCR %%)** measures the proportion of highly liquid assets to ensure a bank's ongoing ability to meet short-term obligations and ride out any short-term liquidity disruptions. LCR must be higher than 100% minimum, with a suitable buffer. [High Quality Liquid Assets / Total Net Cash Flow].
- **Loan to Deposit Ratio (LDR %)** measures a bank's overall liquidity. The ideal LDR is 80% to 90%. [Total Loans / Total Deposits].

KPIs & industry benchmarks



Benchmarking allows organizations to know their standing relative to comparators and determines 'best in class' performance.

- Related IBM publications for more insights:
- [Metrics and benchmarks for retail banks](#)
 - [Benchmark Wizard: banking and financial markets](#)

		Sample size	Median	Benchmark (80 th percentile)
Cost and income	Cost-to-income ratio.	714	40%	35%
	Annual non-interest expense per retail banking customer.	714	\$435	\$150
	Annual retail bank revenue (interest income plus fee income) per retail banking customer.	714	\$705	\$2,062
	Annual fee income per retail banking customer.	714	\$205	\$706
	Overall personnel costs for the business entity (including benefits) as a percentage of revenue.	66	18%	9%
Efficiency and effectiveness	Full time equivalents (FTEs) performing retail banking activities per billion US Dollars operating expense.	714	7,407	3,835
	Rate of employee turnover (voluntary or involuntary).	96	17%	11%
	Retail banking customers per branch.	570	10,785	30,061
	Net Promotor Score (NPS) for customer experience.	714	30	45
	Self-service transactions as a percentage of all retail banking transactions.	714	65%	75%
	Annual rate of growth in number of deposit accounts.	714	3.5%	4.1%
	Fraudulent payments as a percentage of all payments.	541	20%	15%
	Website new visitor conversion rate.	55	6%	10%
	Percentage of the financial forecast that is created through touchless processing.	47	30%	30%
	Annual savings (cost avoidance and cost takeout) achieved by procurement department as a percentage of annual spend.	55	5%	6%
	Average minutes to resolution for high-severity incidents.	188	20	15
	Average number of defects identified in production per thousand lines of code.	188	32	24

Benchmark is the top-performing 20th percentile for retail banks' scores in our database, in other words, 20% scored better than this value.



Component Business Model

Banking and Financial Markets

Banking and financial markets organizations need to accelerate their business and sustainability journey.

Component Business Model serves as a catalyst for driving banking and financial markets transformation by providing insights into “where to take action, prioritize, and why”.

CBM is a framework designed to model and assess businesses, enabling the organization and categorization of various business activities into fundamental units known as "business components"¹

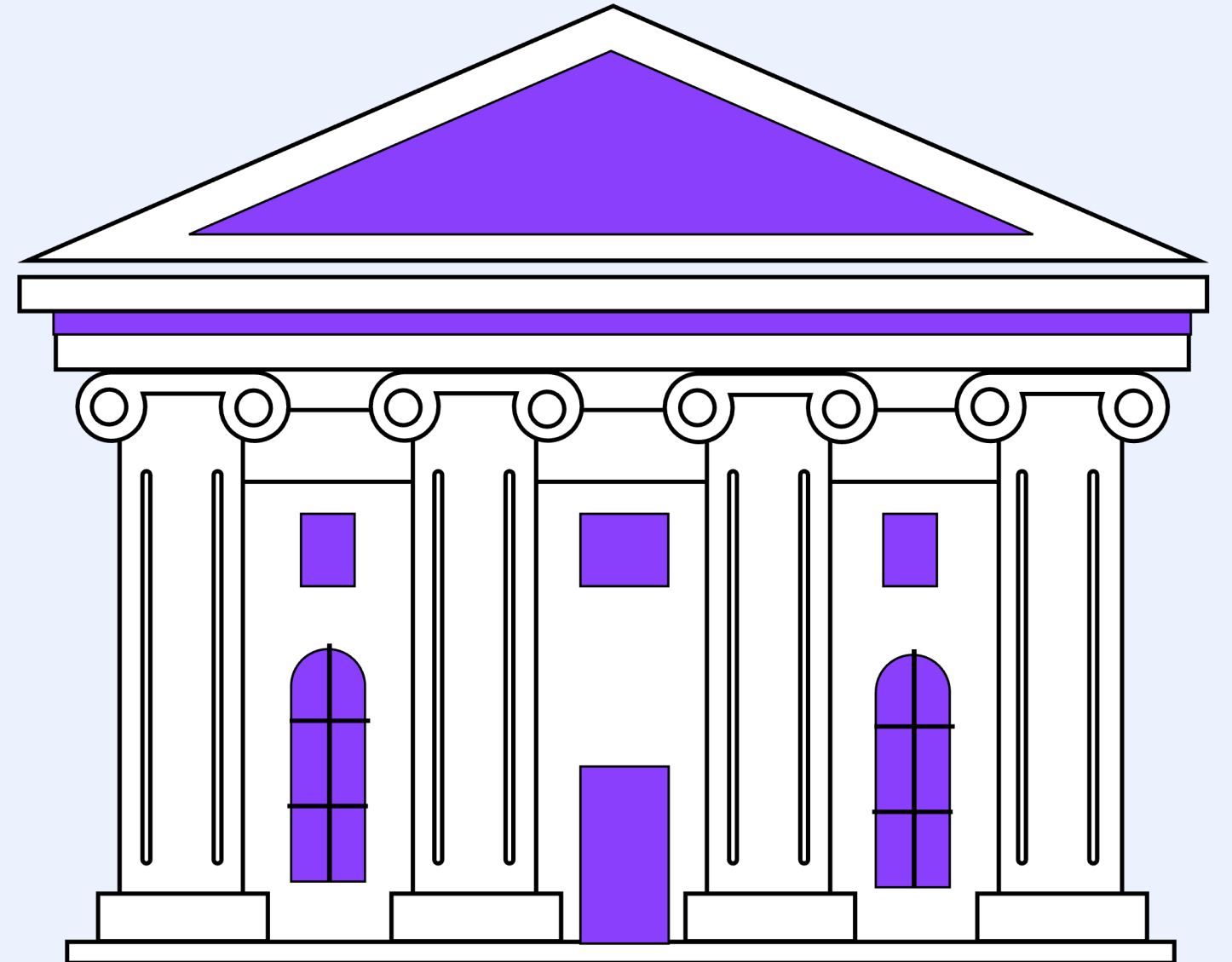
CBM makes clear how leadership run the business through an Enterprise-on-a-page structure.

[CBM Map – full-service banking](#)

CBM.A2									
A. Strategy & Direct	Strategy & Oversight	Proposition	Customer Interaction	Service Offering/Delivery	Treasury Services	Operations Support		Financial & Regulatory Obligations	Enterprise Services
	Group Policy	Customer & Segmentation Strategy &...	Customer Risk Appetite		Asset/Liability (ALCO) Policy			Risk Management Policy	Information & Technology Policy
	Financial Resource Strategy & Plann...	Value Proposition Strategy & Plann...	Network Sales Planning & Management					Shariah Policy	Human Resource (HR) Policy
	Enterprise Architecture & IT Strate...	Product Strategy & Planning	Sales & Relationship Management						
	Business Strategy	Portfolio Asset Strategies							
B. Manage & Monitor	Business Alliances Oversight	Brand Management	Relationship Development & Managem...	Service Delivery Planning & Overrig...	Asset / Liability & Liquidity Risk ...	Operations Servicing Planning & Ove...		Economic Capital Management	Human Capital Governance & Activity...
	Business Planning, Budgeting & Fore...	Acquisition Planning	Marketing Actions Engagement	Investor Management Policy & Plans	Capital Markets Policy & Plans			Global Risk Management	IT Business & Risk Management
	External Stakeholder Management	Customer Experience Management	Value Proposition Information Shar...	Retail Portfolio Administration (Co...	Market Data Management			Risk Monitoring	Human Capital Planning
	Financial Consolidation	Experience Innovation & Differentia...	Omnichannel Activity & Performance ...	Investment Asset Management	Treasury & Trading Front Office Ove...			Credit Risk Management	
	Business Function Management	Aggregated Customer Engagement Mode...	Branch/Broker Plans & Policy	Investor Management Oversight	Trade Management			Market Risk Management	
	Change Planning & Governance	Experience Monitoring	Branch/Broker Oversight & Relations...	Asset Allocation Planning	Instrument Static Data Management			Operational Risk Management	
	Corporate Development	Pricing Strategy & Planning		Loan Value Management Services Plan...				Reputation & Compliance Risk Manage...	
	Business Policies & Governance	Product Innovation & Lifecycle Mana...		Loan Value Management Services Ove...				Financial Resource Management	
	Business Partnering & Decision Supp...	Product Development		Product Control				Management Reporting	
	Research	Marketing Actions Planning & Adviso...		Corporate Product Services Support				External Reporting	
	Corporate Social Responsibility	Marketing Actions Oversight & Revie...		Business Performance Measurement				Fixed Asset Register	
	External & Internal Communication	Acquisition Oversight		Performance Reporting				Shariah Control	
	Correspondent Banking Relationship ...								
C. Execute & Deliver	Business Analytics Services	Customer Behaviours Modelling	Customer Knowledge Creation & Maint...	Retail Lending	Treasury Execution	Case & Exception Handling	Customer & Relationship Administrat...	Enterprise Tax Services	Leadership & Talent Program
	Customer Research Services	Marketing Actions Design & Developm...	Investor Profile	Payments, Cash & Liquidity Managem...	Funding	DDA/Deposits Products	Fee Management & Billing	Accounting & Control	Education & Training
		Target Lists (Prospecting)	Customer Selection	Insurance Advisory Services, Solu...	Capital Markets Cross-Product Servi...	DDA/Check-Specific Processing	Customer Loyalty Administration	Financial Control & Reporting	Worker Qualification & Certification...
		Appointment & Event Management	Customer Recognition & Authenticati...	Wealth Management Solutions & Supp...	Capital Markets Trading Operations	Cheque Processing	Correspondence	Audit & Legal Compliance	Human Capital Sourcing & Negotiatio...
		Campaign Execution	Network Monitoring & Support	Funds/Market/Asset Assessment	Capital Markets Custody Services	Paper Item Processing	Application Processing	Compliance	Workforce Deployment
		Event Driven Actions Execution	Inventory & Logistics	Stockbroking Services & Support	FX	Credit Administration	Account Administration	Financial Crime Prevention	Knowledge Management
		Price/Rate Dissemination	Smart Routing	Merchant Services Solutions & Supp...	FX Operations	Loans Administration	Fees/Interest to charge	Financial Crime Investigation	Employee Compensation & Benefits Pa...
		Product / Solution Assembly	Key Management	International Trade Services Solu...	Funds & Debt / Equity Instruments	Loan Instrument Fulfillment	Exception Handling	Enterprise Legal Services	Incentive Pay / Variable Pay Admini...
		Content Management	Teller Services	Investment Banking Solutions & Supp...	Stock Borrowing & Lending	Warehouse Lending	Falls Handling	Corporate Actions	Employee Performance Management
			ATM Services	Structured Products	Securitization/Syndication	Foreclosure	Loss Prevention / Mitigation		Payroll Services
			ATM Operations	Corporate Advisory Business	Reconciliations	Collateral Management	REG (Real Estate Owned)		Human Resources Operational Support
			ATM Maintenance & Support	Trust Services		Collateral Administration	Fund Administration		Information & Data Management
			VISA	Custody Services		Payments Execution	Property Claims		Security, Identity & Access Managem...
			MasterCard	Global Markets Trading Services		Transaction Capture Services	Cards Administration		IT Solution Development & Release
			American Express	Client Dealing/Trading		Transaction Authorisation	Issuer Accounting		IT Operations
			Complaint Remediation	Advisory Trading		ACH	Transaction Consolidation		Help Desk & End User Support
			Distressed Credit Management	Discretionary Trading		Underwriting	Insurance Administration		Data Extraction & Document Archive
			Bankruptcy	Execution & Order Management		Wealth Management Administration	Insurance Claims Administration		Business Resilience
			Trust Administration	Transaction Execution		Merchant Services Administration	Investor & Portfolio Services		Business Change Execution
			External Party Support	Master Servicing		Merchant Application & Activation	Sharia Asset Management		Business Process Instrumentation & ...
			Third Party Services	Confirmations & Matching		Merchant Contact Centre	Corporate Actions & Dividends		Procurement & Supplier Management
			3rd Party Sales	Deal Confirmation		Terminal Deployment	HQST Merchant		Real Estate Strategy & Operations
			Commissions Management	Security Settlements		Voice Authorisations	Terminal Maintenance & Support		
			Agency Commissions	Valuation (mark to market)		Price	Merchant Information & Account Mana...		
				Counterparty & Account Maintenance		Interchange	POS Merchant		
						International Trade Services Solu...	Merchant Portal		
						Trade Services & Finance Specific P...	POS Services		
						Cash & Liquidity Management Admini...			

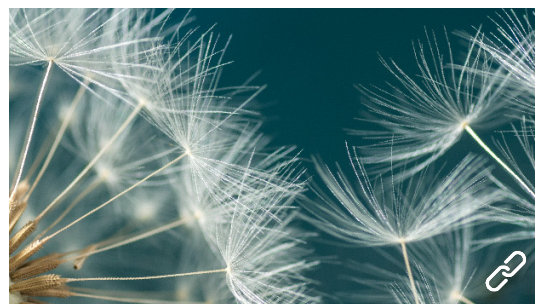


Educational Resources



Thought leadership

[Click on the images to open the studies](#)



Embedded finance: Creating the everywhere, everyday bank

Embedded finance is essential for modern banking strategies. Learn how financial institutions are boosting business performance on the platform economy.



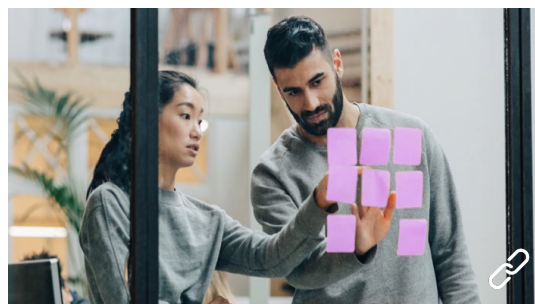
Embedded finance: The voice of the makers

Hear from experts and makers what opportunities embedded finance creates for banks, non-banking partners, and tech-forward competitors.



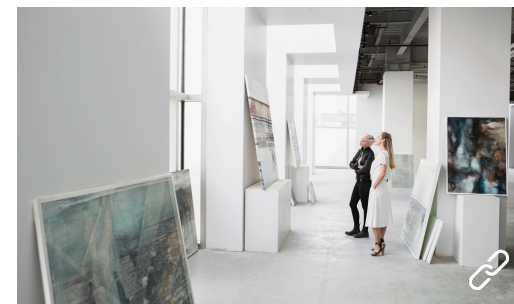
2023 Global Outlook for Banking and Financial Markets

Banks and financial markets firms can expect “certain uncertainty” in 2023. What might an agile response look like this year?



Foundations of banking excellence

Explore IBM and BIAN’s findings on how healthier financial institutions and banks accelerate digital transformation and digitalization.



State of the union in Banking enablement deck

Learn why organizations expect edge computing to improve operational responsiveness—and reduce operating costs.



Security, the cost of data breaches, and AI for Banking and Financial Markets

CEOs of Banking and FM institutions define cyber risk as their top challenge

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[IBV banking & financial markets industry page](#)

Supplementary resources

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[IBM Consulting Strategy and Capabilities Deck: 2023 Edition](#) – Latest market trends and IBM consulting priorities. Click on Contents page to navigate to industry strengths slides

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workspace in Slack

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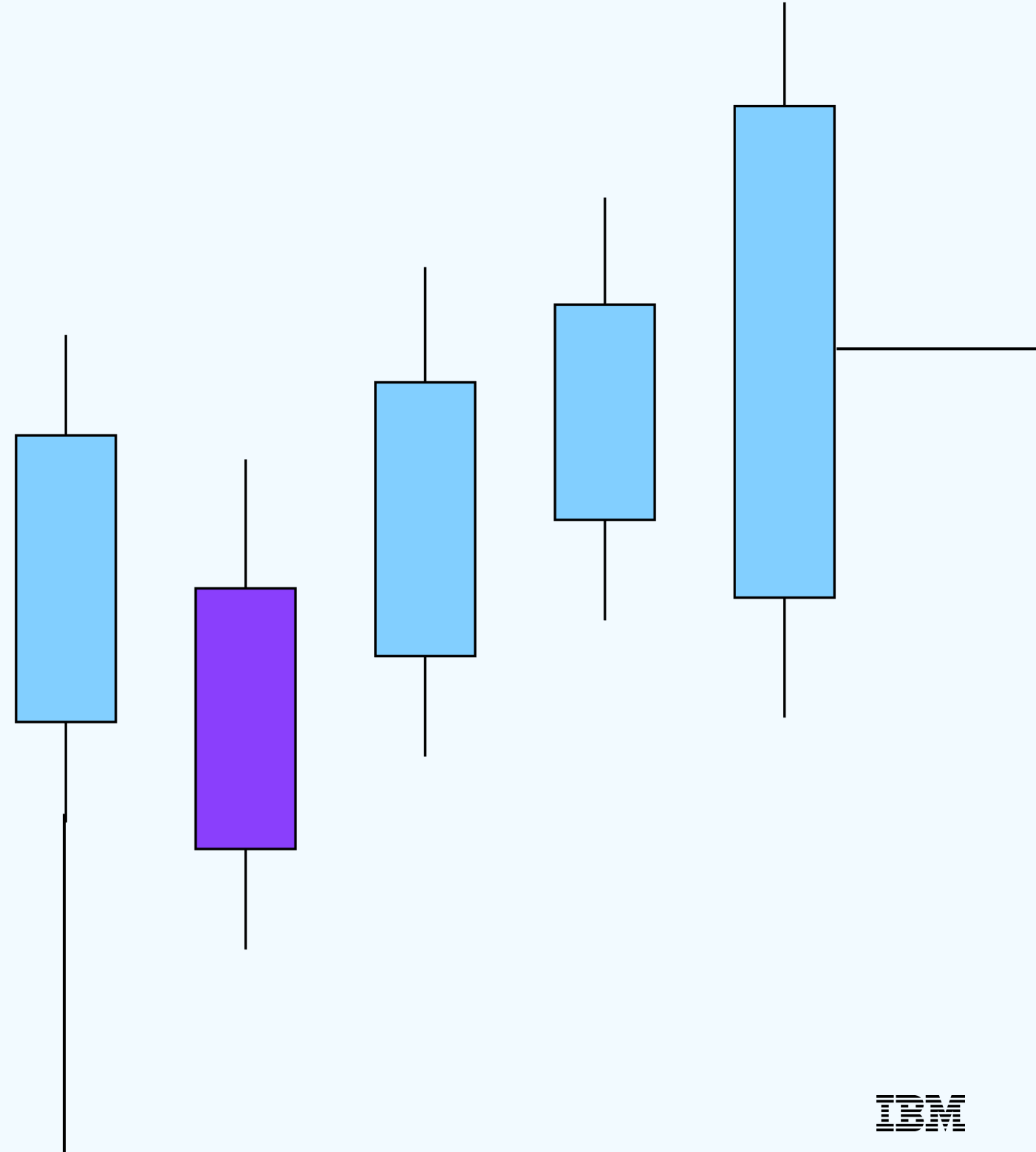
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[IBM banking and financial markets homepage](#) - Organization level information on banking and financial markets solutions, insights and case studies

[IBV banking and financial markets industry page](#) - IBM Institute for Business Value - Thought leadership

IBM Blogs - [Banking](#) and [Financial Services](#)
- Recent updates and quick reads on IBM's contribution to banking and financial markets

References



References

Industry Overview

1. *2023 Chief Executive Officer Study*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/203094?ref=203094_1246_File

Industry Dynamics

1. *Why Is Inflation So High Right Now?* Entrepreneur. 2023. <https://entm.ag/cpZUUh>

2. Tepper, Taylor and Benjamin Curry. *Federal Funds Rate History 1990 to 2023*. Forbes. 2023. <https://www.forbes.com/advisor/investing/fed-funds-rate-history/>

3. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, Diane Connelly, and Connor Loessl. *2023 Global Outlook for Banking and Financial Markets*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/documents/195084?ref=195084_1246_File

4. Duggan, Wayne and Michael Adams. *September Fed Meeting: Interest Rates Are Put On Hold, One More Rate Hike Likely*. Forbes. 2023.
<https://www.forbes.com/advisor/investing/fomc-meeting-federal-reserve/>

5. *Global Financial Stability Report*. International Monetary Fund. 2023.
<https://www.imf.org/en/Publications/GFSR/Issues/2023/04/11/global-financial-stability-report-april-2023>

6. Ibid

7. Ibid

8. Ramamurthy , Shanker, John Duigenan, Paolo Sironi, Diane Connelly, and Connor Loessl. *Embedded finance: Creating the everywhere, everyday bank*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/206716?ref=206716_1246_File

9. Ibid

Industry Dynamics (continued)

10. Ibid

11. Ibid

12. Ibid

13. Ibid

14. *2023 Chief Executive Officer Study*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/203094?ref=203094_1246_File

15. Ibid

16. Ibid

Industry Trends

1. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, Diane Connelly, and Connor Loessl. *2023 Global Outlook for Banking and Financial Markets*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/documents/195084?ref=195084_1246_File

2. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, Diane Connelly, and Connor Loessl. *Embedded finance: Creating the everywhere, everyday bank*. IBM. 2023.
https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/206716?ref=206716_1246_File

3. Ibid

4. Ibid

5. Ibid

6. Ibid

7. Ibid

8. Ibid



References

Industry Trends (continued)

9. Ibid

10. Ibid

11. *2023 Chief Executive Officer Study*. IBM. 2023. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/203094?ref=203094_1246_File

12. *Green Investment – the Uncertain Future of Sustainable Bonds in 2023*. Bloomberg. 2023. <https://www.bloomberg.com/professional/blog/webinar/green-investment-is-the-greenium-alive-and-well-in-2023/>

13. *Pathways in transformative sustainability: banking CEOs own their impact*. IBM. 2022. <https://www.ibm.com/thought-leadership/institute-business-value/en-us/blog/pathways-sustainability-banking-ceos>

14. *ESG reporting and performance (2023)*. IBM. 2023. <https://w3.ibm.com/services/bcs/competency/benchmarking/wizard/protect/bmwizard.ws/showResultsPage2?functionId=53651>

15. Ibid

16. Ibid

Technologies

1. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, and Diane Connelly. *Foundations of banking excellence: Practices and priorities to accelerate digital transformation*. IBM. 2022. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/190607?ref=190607_1246_File

2. Ibid

3. Ibid

4. Ibid

Technologies (continued)

5. Chief data officer study. IBM. 2023. <https://w3.ibm.com/services/bcs/competency/benchmarking/wizard/protect/bmwizard.ws/showCoverPage2?pageType=2&refId=53558>

6. *The Benefits of the Blockchain in Financial Services: Modern Solutions and Examples*. Coinpedia. 2023. <https://coinpedia.org/guest-post/benefits-of-blockchain-in-financial-services-modern-solutions-and-examples/>

7. *Swift unlocks potential of tokenisation with successful blockchain experiments*. SWIFT. 2023. <https://www.swift.com/news-events/press-releases/swift-unlocks-potential-tokenisation-successful-blockchain-experiments>

8. *6 Ways the IoT is Revolutionizing the Banking and Investment Sector*. AIIOT. 2023. <https://www.aiiottalk.com/iot-revolutionizing-the-banking-and-investment-sector/>

9. *2023 Chief Executive Officer Study*. IBM. 2023. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/203094?ref=203094_1246_File

10. Egger, Daniel, Paolo Sironi, Richard Warrick, and Stefan Worner. *Exploring quantum computing use cases for financial services: Applying emerging quantum technology to financial problems*. IBM. 2019. https://w3.ibm.com/services/lighthouse/documents/145398?ref=145398_1246_File

11. *Quantum use case*. IBM. 2023. <https://ibm.seismic.com/Link/Content/DC9dpHCVH3mGpGcDcb8h9G3W9VJd>

12. Quantum readiness. IBM. 2023. <https://w3.ibm.com/services/bcs/competency/benchmarking/wizard/protect/bmwizard.ws/showCoverPage2?pageType=2&refId=54250>

13. Ibid

14. Ibid

15. Ibid

16. Ibid

17. Ibid



References

Appendices – Generative AI

1. *Generative AI: “State of the Enterprise Market”: Banking and Financial Markets*. IBM. 2023. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/204579?ref=204579_1246_File
2. Maufe, Zac and Toby Brown. *Five generative AI use cases for the financial services industry*. Google. 2023. <https://cloud.google.com/blog/topics/financial-services/five-generative-ai-use-cases-financial-services-industry>
3. Borden, Bill. *The era of generative AI: Driving transformation in banking*. Microsoft. 2023. <https://www.microsoft.com/en-us/industry/blog/financial-services/2023/05/04/the-era-of-generative-ai-driving-transformation-in-banking/>
4. Falk, Ruben. *The Next Frontier: Generative AI for Financial Services*. Amazon. 2023. <https://aws.amazon.com/blogs/industries/the-next-frontier-generative-ai-for-financial-services/>
5. Ibid

Appendices – Hybrid Cloud

1. *IBM transformation index: state of cloud*. IBM. 2022. <https://w3.ibm.com/services/bcs/competency/benchmarking/wizard/protect/bmwizard.ws/showCoverPage2?pageType=2&refId=53450>
2. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, and Diane Connelly. *Foundations of banking excellence: Practices and priorities to accelerate digital transformation*. IBM. 2022. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/190607?ref=190607_1246_File
3. Ibid

Appendices – Cybersecurity

1. Sironi, Paolo and Diane Connelly. *Security, the cost of data breaches, and AI for Banking and Financial Markets*. IBM. 2022. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/188619?ref=188619_1246_File
2. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, and Diane Connelly. *Foundations of banking excellence: Practices and priorities to accelerate digital transformation*. IBM. 2022. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/190607?ref=190607_1246_File

Appendices – Open Innovation and Ecosystems

1. *Payment services: revised rules to improve consumer protection and competition in electronic payments*. European Commission. 2023. https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3544
2. Ramamurthy, Shanker, John Duigenan, Paolo Sironi, Diane Connelly, and Connor Loessl. *Embedded finance: Creating the everywhere, everyday bank*. IBM. 2023. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/206716?ref=206716_1246_File

Appendices – Component Business Model

1. *Full-Service Banking Extended (3 accountability levels view)*. IBM. Accessed in October 2023. <https://cbm-ai.wdc1a.cirrus.ibm.com/Library/repo:f29fa11b-7dfd-4329-9d04-9dcf9d6a898a>

Appendices – KPI & Industry Benchmarks

1. *Metrics and benchmarks for retail banks*. IBM. 2022. https://w3.ibm.com/services/lighthouse/spaces/view/banking-financial-markets/documents/206244?ref=206244_1246_File