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Two Routes to Digital Success In Capital Markets

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Two Routes to Digital Success In Capital Markets

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Executive Summary

Digital technologies are deeply embedded into the daily activity of every capital markets professional. They have transformed the sales and trading business over time and will continue to do so.

Despite their potential, however, corporate and investment banks have achieved mixed results from previous digital investments. Too often, banks have found themselves fighting and losing a technological arms race for which they are ill-equipped. In trying to keep up with competitors deemed "best in class," they have suffered from disappointing *e* ("electronic") economics, seen expensive bets go awry, and struggled with governance, capabilities and culture that hamper delivery. When they do succeed in building digital franchises, they find these franchises vulnerable to disruption and expensive to maintain.

The reality is that there are two very different routes to digital success in capital markets. The first, the *all-in* approach, makes sense for only a handful of banks with a strong propensity for electronic trading and a track record of technology delivery. These banks will fully embrace digital technologies across the value chain and fundamentally change their business models. They will be able to achieve 30 percent-plus growth in selected digital businesses, even in low-growth environments.

Most banks will be better served by taking a second, *targeted* approach. Their digital investments will be limited and tightly focused on protecting client franchises and reducing operating costs. They will avoid big bets on unproven technologies and market structure. In many cases, they will realize that for them technology is not a competitive advantage and will outsource heavily.

The value at stake for banks on both routes will be significant: 20 to 30 percent of P&L improvement or a two to three percent improvement in ROE. But these savings will come from different sources depending on the route followed. In today's world of depressed corporate and investment

banking ROEs, this potential should put digital squarely on the agenda of capital markets leaders. For banks on the all-in route, the key drivers will include incremental revenues from highly competitive liquidity provision across electronic channels, significant transformation of front-office roles and scope from shifting to electronic trading, and cost savings from end-to-end automation of support functions. For banks taking the targeted approach, the revenue opportunity will be limited, but cost savings from *e* client coverage and automation and outsourcing across the value chain will be significant.

As they survey innovation by both third parties and competitors ranging from tools for workflow management to machine learning and distributed ledger ("blockchain") technology, banks will need to decide where to invest. Because of the value at stake, investments focused on automation and leveraging third-party utilities will be a "no regret" move for virtually every bank, regardless of what digital path they take.

To overcome misaligned incentives and inertia, banks will need to set up the right governance and build cross-functional capabilities. All-in banks will opt for parallel *e* organizations or at least a high degree of central organization. Targeted banks will proceed with greater decentralization. Banks will also need to invest in the appropriate supporting IT architecture. They will need to develop modular architectures that are tightly aligned with client needs and that emphasize data integrity and embed risk and compliance processes.

There are four immediate priorities for banks assessing their digital position:

- carefully define digital strategies
- invest in a digital operating model with cross-functional capabilities
- launch "no regret" automation of the operations and technology stack
- build the innovation pipeline.

A Mixed Track Record in Digital

Digital has been transforming the capital markets landscape for the past two decades across functions and products. Virtually no area has been left untouched (Exhibit 1, page 4).

The front office: Sales and trading

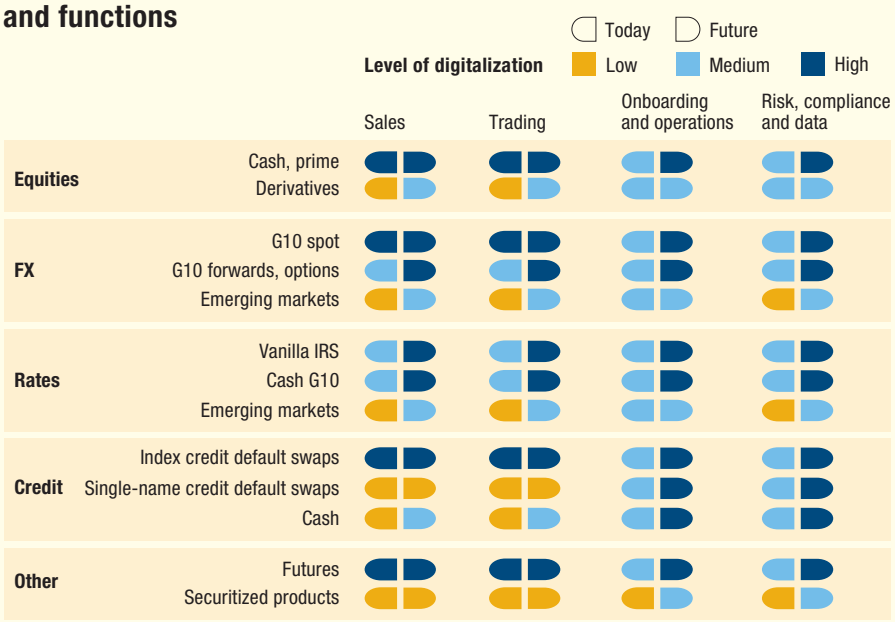
The biggest impact has arguably been felt by *sales and trading*. Digital channels have become one of the primary ways to access a bank's offerings and people. Often, this is through bank or third-party platforms where clients can view and request price quotes and execute transactions digitally. In some cases, clients can use these portals to access research and analytics or even engage with salespeople to structure complex products and run simulations. In other cases, products, services and tools are packaged into apps allowing a high degree of client customization. Beyond these platforms, clients frequently use chat systems or direct data feeds providing information related to pricing and execution.

To support these digital interactions, banks have built substantial capabilities in electronic transacting. They can offer agency execution or make markets electronically, automatically aggregating the relevant liquidity on the one hand and pricing and hedging on the other. They have also invested in sophisticated algorithms to improve execution (often with colorful names like Sniper, Sniffer, Iceberg or Guerilla) and even new venues to trade (e.g., venues for corporate bond auctions, dark pools).

The intelligent use of data underpins all of these activities. Real-time market data feeds, streaming prices and predictive analytics are honed to make trading decisions, place orders and make markets. Increasingly, teams in client analytics and customer relationship management leverage similar capabilities to help coverage and sales professionals develop trade ideas for clients. Across sales and trading, investment in data capabilities (e.g., in data scientists, capital and balance sheet analytics) and in underlying data

Exhibit 1

Digital impacts the capital markets value chain across all products and functions



Source: McKinsey & Company

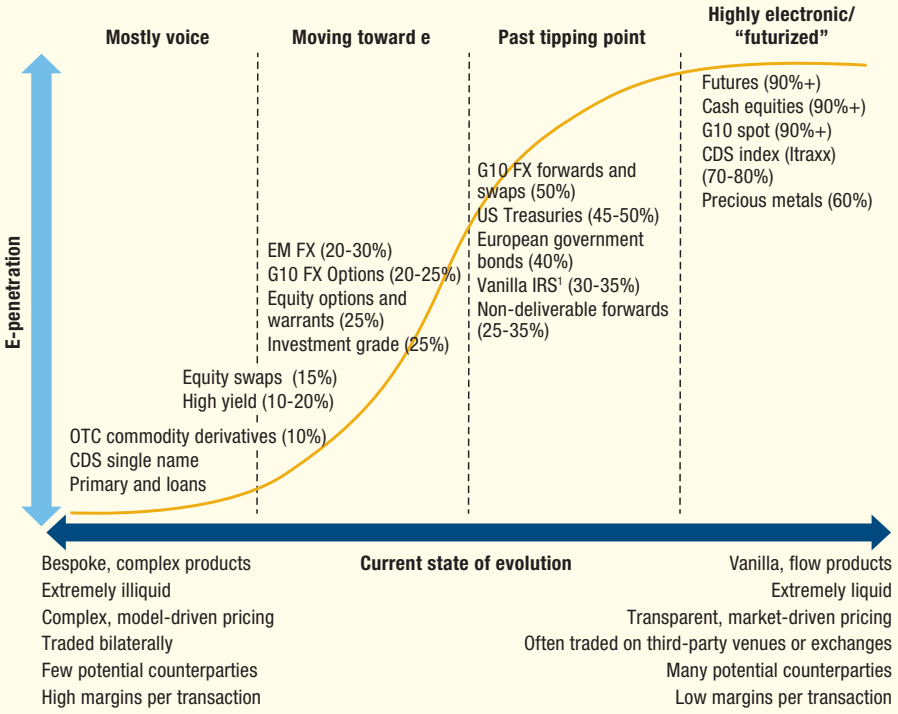
repositories (e.g., consistent client reference data, trade and position repositories) are increasingly crucial foundations for driving performance.

The cumulative impact of these developments on the sales and trading business model of a particular asset class can be profound. Trading through electronic channels now accounts for 90 percent or more of spot G10 FX transactions and equity transactions and is increasingly common in certain areas of rates and credit. Asset class after asset class has moved or is now moving to electronic trading (Exhibit 2, page 5), with a huge impact on the underlying economics. For those products that have led the way, there has been massive spread compression only sometimes counterbalanced by equally massive increases in volumes (Exhibit 3, page 6).

The case of cash equities provides a vivid example of how electronic trading can disrupt market structures. Digital tools for sales and trading have led to a significant reduction in floor brokers and specialists at many leading investment banks, the advent of high-frequency trading firms, and a proliferation of new platforms (exchanges like BATS, dark pools and internal crossing

Exhibit 2

The evolution of electronic trading across asset classes



Note: Not exhaustive

[1] Denominated in USD, GBP or EUR

Source: McKinsey & Company; Greenwich Research

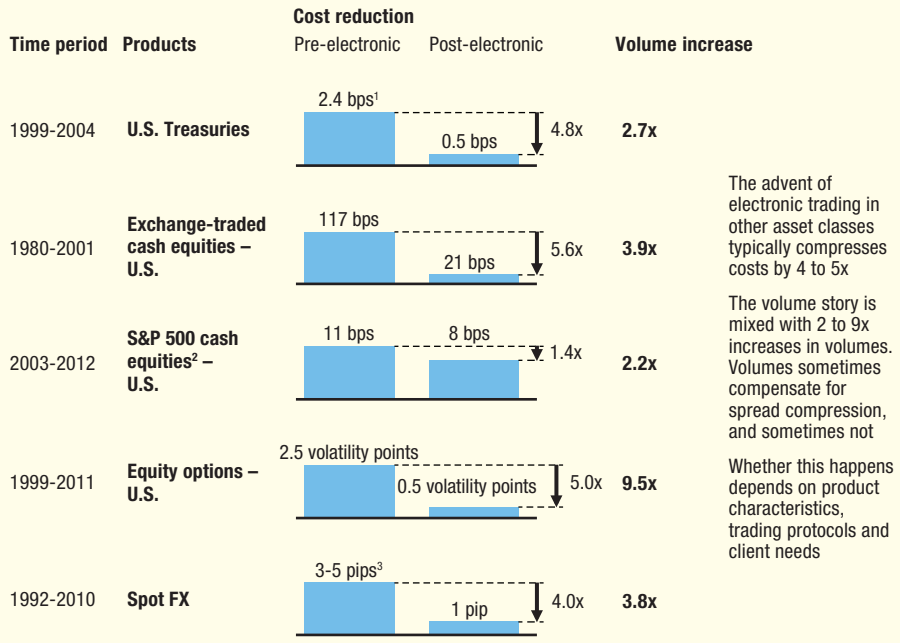
engines). Lucrative "bread and butter" transactions like block trades once done on the phone with heavy trader involvement are now often executed through algorithms. For a subset of clients (e.g., high-frequency trading firms), much of the sell side's commercial activity today could just as easily be housed within an exchange or an alternative provider instead of a bank. The research-led sales model traditionally associated with the product on the other hand is only relevant today for a different subset of clients that may represent a smaller share of the overall revenue pool. (See also "The state of *e* across products," page 8.)

The middle and back office: Operations and risk

The impact of digital tools on the operations and risk side of capital markets has been just as profound as the impact on sales and trading. Manual middle office,

Exhibit 3

Volume and spread compression in previous waves of digitization



[1] Basis points

[2] Represents the next phase of the evolution of electronic trading

[3] Percentage in points

Source: Citi; McKinsey Corporate & Investment Banking Practice

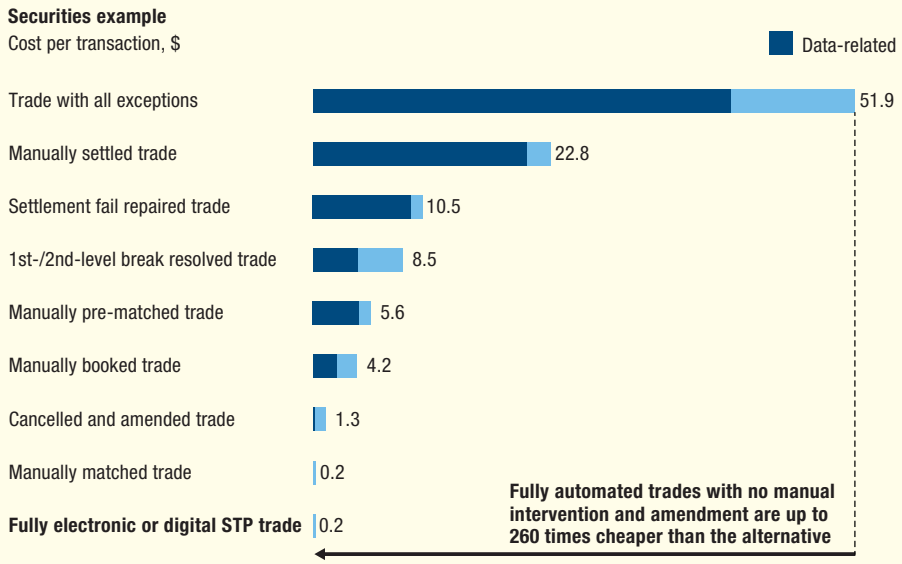
back office and risk processes ranging from trade confirmation to P&L production and valuation have been heavily automated. Vanilla flow products (G10 currency pairs, highly liquid stocks) boast straight-through-processing (STP) rates of around 98 percent and trades that "do not touch the sides" are up to 260 times cheaper and offer a significantly better control environment (Exhibit 4).

This automation is often supported by the use of industry standard platforms. Tools like Scrittura and Thunderhead for document management or MarkitWire and Swapswire for derivatives confirmation are used by most banks. Utilities for risk functions like know-your-customer (KYC) and anti-money laundering have also emerged.

Across operations and risk, banks have invested in client-facing tools to deliver self-service and access to reports confirming that trades have cleared

Exhibit 4

Voice versus digital cost per trade



Source: McKinsey Corporate & Investment Banking Practice

and settled and providing P&L and collateral valuation reports. Finally, particularly in risk, banks have leveraged analytical capabilities to identify problematic transactions and improve the control environment.

Challenges in digitization

The impact of digital technologies has been pervasive in capital markets. But banks need to temper their enthusiasm with caution. While some banks have experienced significant digital successes, others have achieved mixed results. There is often a sharp contrast between bold visions of the digital future and the immediate difficulties banks face in actually managing digital initiatives. The root causes behind many of these challenges are often errors of strategy and planning. Banks have misread the economics of electronic trading, failed to anticipate market structure changes or engaged in expensive “me too” initiatives that were not sufficiently differentiated. In other cases they have underestimated the capabilities and mindset shift required for digital to succeed.

The state of *e* across products

Futures were one of the original asset classes to "go" electronic, with *e*-penetration at 90 percent or more. Products are highly standardized, and most trading occurs on exchanges, with banks providing clients with direct market access, aggregation and agency execution. Banks also provide clearing, margining and other post-trade services, often through electronic channels, and earn significant economics from these.

Equities are also highly electronic, particularly on the cash side. As with futures, most cash trading occurs on electronic venues—exchanges, dark pools, internal crossing engines and BATS—with a number of new market participants such as hedge funds and high-frequency trading firms taking on the role of a traditional market maker in lieu of the floor specialists of old. The advent of electronic trading drove significant increases in volumes and reduced costs. On the derivatives side, electronic trading is also common and correlates with the standardization of the product. Simple options and warrants trade electronically but derivatives with complex underliers or structured payoffs are less amenable to classic electronic trading. Instead, the market has seen banks offer innovative structuring platforms via their single-dealer platforms, where clients (often private banks) and salespeople can work together to structure and price new instruments.

Foreign exchange has evolved somewhat differently in terms of electronification. While G10 spot FX in particular, as well as forwards, swaps and options, all trade electronically, the market has not moved to an exchange-like structure. Instead, bank-sponsored single-dealer platforms compete with multidealer platforms to attract volumes—with neither winning out. The single-dealer platforms offer customization, integration with wealth management and transaction-banking platforms, crossing against internal flows, and value added services. Third-party platforms compete on pricing through greater transparency and multiple quotes. Emerging markets currencies are following G10 pairs toward greater electronification. Meanwhile, non-deliverable forwards, where the underlier is often an emerging markets currency, will move to electronic trading on swap execution facilities (SEFs) as a result of the Dodd-Frank mandate. Finally, cryptocurrencies, though at a nascent stage, are being monitored carefully as a new frontier for currency trading.

Rates products have seen major shifts in electronic trading over the last three to five years. Cash trading, especially in on-the-run U.S. Treasuries and European government bonds,

(continues on next page)

is already well past the tipping point to full-on electronification and these products typically trade on multidealer platforms. Where there is sufficient liquidity, volumes in these, as well as sovereign, supranational, agency and covered bonds, are likely to increase. Vanilla interest-rate swaps have seen a step-change in *e*-penetration with the introduction of mandated SEFs in the U.S. Europe is expected to follow suit with the introduction of multilateral trading facilities (MTFs) and organized trading facilities (OTFs). Contrary to initial expectations, market structure has remained focused on multidealer RfQs rather than moving to central limit order books.

Credit is an asset class where electronic trading has gained limited traction. On the cash side, small clips of investment-grade and high-yield bonds will trade on multidealer platforms. A number of dealers and third-party providers have attempted to increase *e* liquidity in these markets. Buy-side players have attempted to disintermediate dealers by directly connecting to one another. Sell-side players have experimented with innovative trading protocols such as auctions to create "flashpoints of liquidity." Third parties have created multidealer platforms and exchanges. Technologists have attempted to apply "fuzzy logic" to better match buyers and sellers. Despite these innovations, these markets remain structurally difficult to move to electronic channels. Bonds are far less fungible than equities—markets tend to trade one-way. On the derivative side, highly liquid on-the-run indices are highly electronic and have been pushed to SEFs by regulation. Single-name credit default swaps (CDS), despite being subject to similar (though still incomplete) SEF regulation to that impacting indices, have not seen an uptick in electronic volumes. The asset class remains fundamentally illiquid, and challenging balance sheet treatment by new regulations has only reduced liquidity further.

Securitized products (with the critical exception of to-be-announced mortgages) also continue to trade primarily on voice channels. Complex and often bespoke, they are not amenable to electronic trading. In the near term, the main opportunity for digital in this area is in analytics tools for valuation and structuring that can increase voice volumes.

- **Misunderstanding the economics of electronification.** Many of the digital investments banks have made are simply not profitable. In many asset classes, banks connected to all the right venues but quickly found that just "showing up" wasn't enough to drive the top line. Electronification brought these banks margin compression but volumes did not increase commensurately. Clients insisted that banks be present on various electronic venues as a pre-condition for relevance in the asset class, but the new mix of electronic and voice business was less profitable than the old. For these banks, digital channels became the "shop window" tempting clients to execute more profitable transactions through voice channels, but acting as loss leaders on their own.

  Considering the impact of digital technology on the economics of other industries—say on book sales for every book seller except Amazon—this outcome is far from surprising. By more carefully considering the likely evolution of market structure, banks could have foreseen that digitization would not move the top line in a significant way without a substantial commitment to new capabilities (best-in-class electronic market-making, explicit market share targets, and fully STP architecture). They could have set more realistic initial expectations and realized that for them, digitization was fundamentally a defensive play. They might then have explored alternative routes to profitability (e.g., focusing on using digital channels to lower cost-to-serve to offset the decrease in revenues).

- **Misreading market structure and regulatory shifts.** In other cases, banks have bet wrong on market structure. Sometimes, a particular asset class simply does not electronify as expected. For example, banks and technology players have been trying to crack the puzzle of electronic trading in corporate bonds but none have succeeded so far, despite highly innovative offerings. Structural issues unique to the market (buy-and-hold investors, one-way trading, tens of thousands of securities) have proven too hard to overcome. This is not to say that banks should not have invested in digital in cash credit; only that they might have been better served investing in an alternate set of tools and services (work-flow automation, automated distribution of Axes) and left the big bets to others.

Banks and technology players have been trying to crack the puzzle of *e*-trading in corporate bonds but none have succeeded so far.

Sometimes regulation has changed quickly, making the investment environment treacherous. For example, rules around SEFs and best execution rendered much investment in single-dealer platforms (SDPs) a sunk cost, while simultaneously creating new requirements around SEF connectivity, aggregation and total cost analysis.

In a rapidly changing environment, making bets that do not pan out is hardly surprising. Even the savviest consumer technology firms have their failures. We are not, after all, wearing Google Glasses or updating our playlists on Zune. Nonetheless, carefully "war-gaming" different regulatory outcomes in advance could have resulted in substantial savings or at least a better understanding of the risks.

- **Trying and failing to keep up with the digital Joneses.** In still other cases, banks have failed to build distinctive offerings. Many banks, seeing the success of first movers in digital, launched "me too" offerings. For every successful SDP in the market, there are many that have failed to differentiate their offering enough to gain traction, especially with institutional and large corporate clients. Many late entrants did not question with sufficient skepticism whether the capabilities they were offering would be compelling enough to tempt clients to switch from another bank or a multibank platform. The cost of this sort of misstep can be high, with investments in the range of $100 million or more sometimes failing to achieve payback.
- **The incumbent's dilemma.** Finally, a so-called "incumbent's dilemma" also hampers many banks. Many institutions simply attempt to bolt on digital businesses to what is primarily a voice business. Unfortunately, these businesses come with a host of legacy issues.

  In some cases, a history of acquisitions and historical budgetary constraints has resulted in an IT and data architecture that is highly fragmented. It simply does not provide a reliable framework for building digital offerings without a substantial investment.

  In other cases, in a cost-focused environment, many banks have systematically underinvested in digitalization—and will continue to do so—as other priorities are more pressing. Funds originally earmarked for digital initiatives will frequently be redirected to more immediate concerns around risk or regulatory requirements. In extreme cases, obsolete legacy systems that ought to be phased out will be funded instead of new digital initiatives because they will keep the business going in the short run.

Sometimes, governance is the obstacle. Responding nimbly to a fast-moving technological and regulatory environment is impossible when planning frameworks comprise a mixture of ad-hoc and path-dependent processes ill-suited to quick decision-making.

Finally, culture can be an issue. Often, voice salespeople and traders (and even their leadership) will view digital initiatives with suspicion. They will resist the migration of low-value transactions to electronic channels and be slow to adopt digital tools. Targets around digital adoption and efficiency savings will be far too conservative.

These challenges typically derail a bank's ability to navigate the digital landscape successfully. If banks facing such issues (arguably most banks today) are pragmatic in acknowledging them, however, they can address them up front and develop workarounds.

One way banks have managed the incumbent's dilemma is by creating stand-alone units that are "legacy free." In some cases, these digital capital markets offerings have succeeded spectacularly. However, these successes have looked very different from banks' other businesses and required very specific capabilities, mindsets and governance.

One way banks have managed the incumbent's dilemma is by creating stand-alone units that are "legacy free." In some cases, these digital capital markets offerings have succeeded spectacularly.

Historically, many successful *e*-equities or *e*-FX businesses began as greenfield units with the luxury of building scalable infrastructure from scratch, strong senior sponsorship, independence from the voice business, and end-to-end control of their operations and technology stack. Rarely were they bolted on to an existing voice business.

The economics were driven by the sophistication of execution capabilities, quickly achieving scale, low cost per trade through full STP and, often, access to proprietary flows from transaction banking or private banking that could be internalized. In other cases, the focus was on agency execution and post-trade services (finance, clearing, collateral management). They thus made money differently from voice businesses. Even the flows were distinct from voice (massively more tickets, significantly smaller size).

On the coverage and client side, these businesses often employed a small, dedicated salesforce with a different skillset from high-touch teams (focused on platform penetration and capabilities rather than market developments). They dealt with a different set of stakeholders at the client (execution desks versus portfolio managers, pockets of capital dedicated to high volume or systematic trading strategies).

Only after a period of incubation—say five to ten years or more—after they grew in size and profitability would they finally merge with the voice business. When they did, the asset class in which they operated would often have flipped over to predominantly electronic trading. At that point, these businesses would often resemble an exchange or a hedge fund more than the voice business with which they were merging—and in many cases they would compete directly with both those types of players.

Two Different Routes to Digital Success

Banks seeking to digitize could have avoided many of the problems they faced by taking into account their starting positions and capabilities and following a more sharply differentiated approach.

As banks survey the challenges and opportunities across the value chain, the importance of taking a hard look at their current positioning is even more critical. Banks will realize that they fall into one of two groups: banks that should go all in on digital and fully implement changes across the value chain; and banks that should take a targeted approach and digitize only where it is likely to prove fruitful. The key realization is that full digital implementation will not be ideal or even possible for many banks (Exhibit 5, page 15).

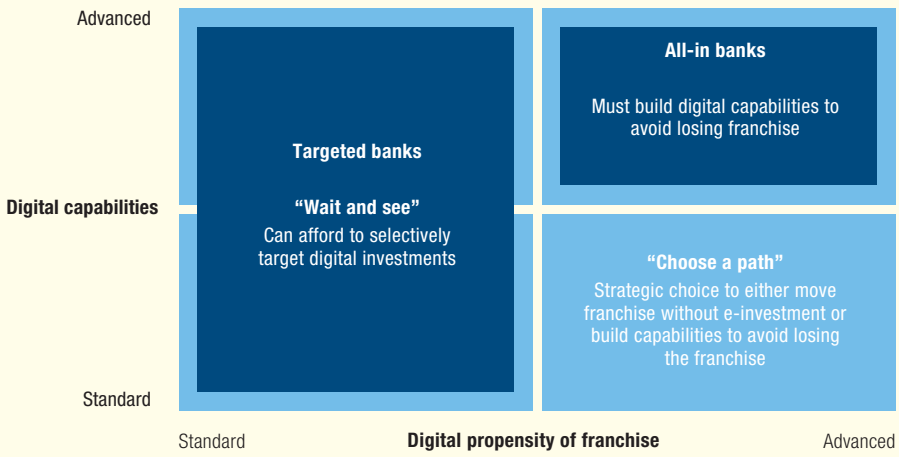
Starting positions

To determine which route is right for them, banks need to begin with an assessment of their current franchise. On the product side, banks with significant exposure to products (equities, FX, treasuries, vanilla IRS) that have moved or are likely to move toward electronic trading have little choice but to invest significantly in digital capabilities. In contrast, banks with franchises weighted toward asset classes less likely to electronify (loans, high-yield bonds, emerging markets, securitized products) can pick and choose where to digitize. In many cases, it will be in their interest to preserve the relatively higher margins in certain areas.

Understanding client needs and behaviors will also be critical. Banks with a substantial portion of revenues coming from clients primarily focused on executing at lowest cost (hedge funds, real money funds relying on capital markets banks for best execution rather than market insight) will find these clients pushing for ever more frequent digital interactions. Highly fragmented client bases (private banks buying structured products, high-net-worth

Exhibit 5

Banks' strategic positioning in digital



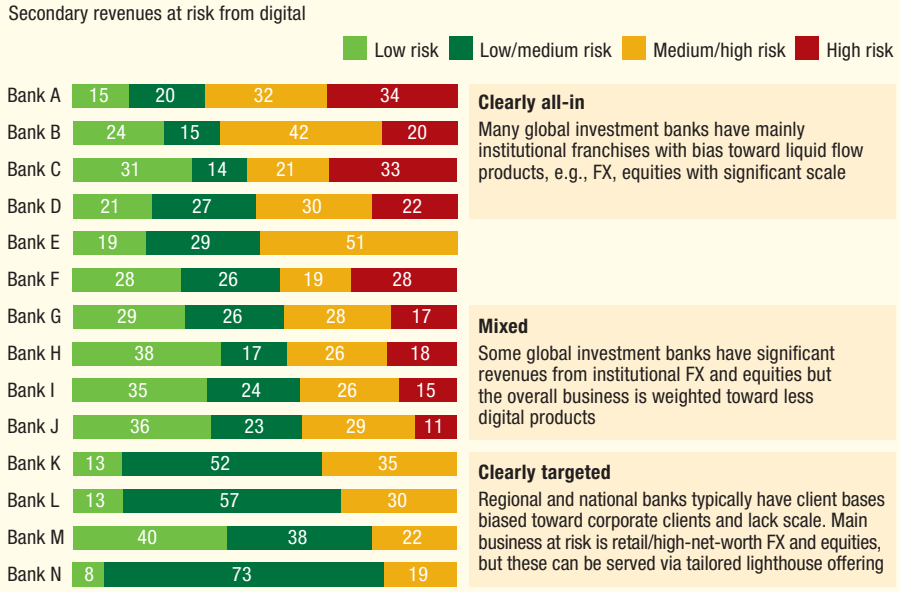
Source: McKinsey Corporate & Investment Banking Practice

individuals, small and medium-size enterprises) will also require highly digitized service models. Finally, capital markets divisions facilitating high-volume, low-ticket flows from adjacent businesses that are going digital (wealth management units, transaction banking, retail banking) will need to adapt their business models accordingly. In contrast, banks serving clients with highly customized needs (corporates hedging specific financings, pension and insurance funds seeking complex asset-liability management solutions) will find these services less amenable to full digitization and face less urgency to upend their businesses.

Finally, banks will need to consider their previous track record at managing digital initiatives. Banks with a history of incubation and delivery of successful digital initiatives (often those with profitable *e* businesses with sufficient scale, or with a history of building market-leading applications and portals) can make a confident bet on end-to-end digitization. In contrast, banks that are late entrants, that have struggled to deliver historically, or that are constrained by funding or governance might find it prudent to explore limited digitization, at least to start.

Exhibit 6

Only 5 to 10 banks are clearly all-in



Source: Coalition; McKinsey & Company

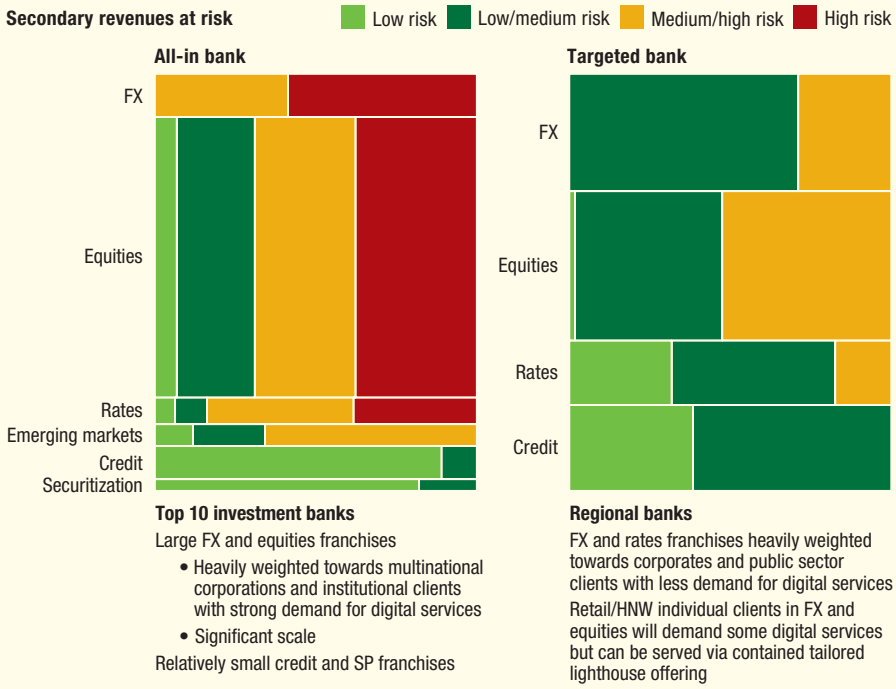
The reality is that only a handful of banks will find the all-in route appropriate. By definition, only a few banks will have the necessary scale required. And only a limited number of banks will have the appetite for the technology spend required. In some cases, banks will follow a more nuanced strategy, with different divisions adopting different approaches (e.g., equities chooses the all-in route and fixed income the targeted route). However, because many of the capabilities for succeeding with the all-in route cut across divisions (e.g., strong IT delivery), this nuanced approach will be rarer than one might expect (Exhibits 6 and 7).

The all-in route

Banks taking the all-in route will end up with business models and economics that look very different from those they have today. Like some *e*-equities and *e*-FX businesses, they will function more like exchanges, focusing on vanilla, electronic products, sometimes moving to agency rather than principal trading, and developing the leanest possible cost base and innovative offerings (Exhibit 8, page 18).

Exhibit 7

All-in and targeted banks have fundamentally different franchises



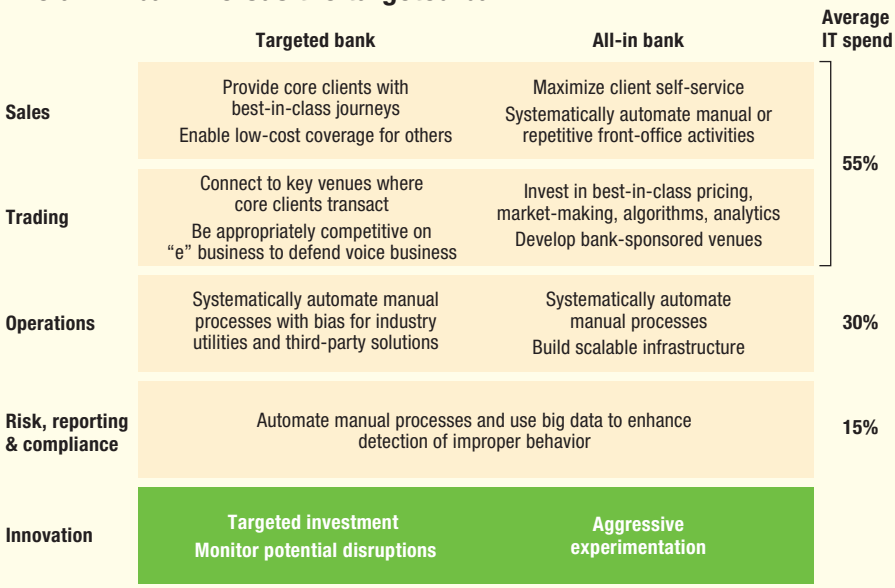
Source: Coalition; McKinsey & Company

Sales and trading. On the sales and trading front, digital channels will become the default for transacting with clients. Coverage models will shift radically as banks ruthlessly examine every front-office routine and manual activity for its automation potential (greater than 50 percent) and mechanize it (Exhibit 9, page 19). Going forward, sales and traders will be fully *e* literate and focus on complex decisions around risk, structuring and senior interactions.

These banks will offer best-in-class execution. They will be present across all relevant electronic venues and actively seek to increase market share through aggressive liquidity provision and pricing. Often, their trading strategies will be dependent on making the best possible use of data. Indeed, like the best quantitative hedge funds, they will treat data as a core asset on a par with capital or people, and invest heavily.

Exhibit 8

The all-in bank versus the targeted bank



Source: McKinsey & Company

Operations and risk. In operations and risk, all-in banks will embrace full-on automation of critical support functions. Trade processes will be fully STP and IT architecture will be highly scalable to cope with increased flows. For these banks, operations and the technology that supports it will be seen as mission critical and a major value driver. Some may even turn their platforms into white-labeled services offered to other participants.

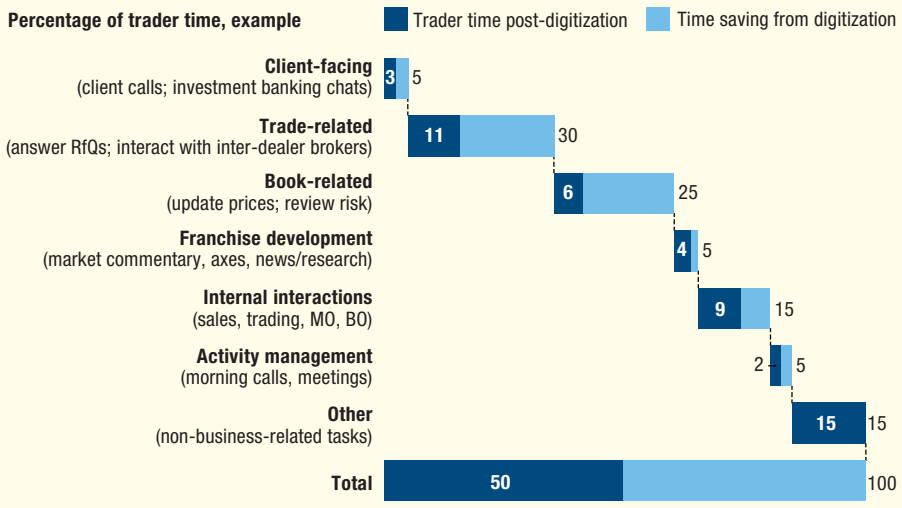
Innovation. Finally, all-in banks will make bold digital bets across the value chain. They will acquire start-ups and use technology to enter new business areas with new models. Ten years from now, it would not be surprising to see all-in banks with crypto-currency trading teams, book builds completed entirely without voice contact with investors, and the next generation of algorithms.

The targeted route

In contrast to their all-in peers, banks choosing the targeted approach will use digital technology to augment existing business models rather than upend them altogether. They can be just as innovative as all-in banks but will focus their efforts differently.

Exhibit 9

Full digitization could save half of front-office trader time



Note: Based on benchmarks

[1] Time saved will be highly dependent on asset class: more esoteric assets will see smaller time savings from digitization. Time saved shown is for highly digitizable asset classes.

Source: McKinsey & Company

Sales and trading. Sales and trading efforts will center on appropriate presence and competitive liquidity and pricing on the core venues for clients. Banks will build and extend "lighthouse" single-dealer offerings for products (FX, derivatives) dedicated to specific client segments (smaller corporates, private banks, less-sophisticated funds). However, they will avoid speculative bets on major shifts in market structure and the associated offerings—preferring to be fast followers rather than first movers. They will also typically eschew investment in multi-asset class SDPs, recognizing that for products where price discovery is the key element of *e*-trading (rates, credit), that function will almost never take place on a single-dealer platform. Instead, they will opt for connectivity to multibank platforms, which are typically low in cost, and establish clear guidelines on how competitive they wish to be on them (e.g., rankings, hit-rate targets).

Beyond the question of specific venues, targeted banks will focus heavily on the client experience. They will ensure that client journeys on digital channels are significantly richer than they are today, leveraging social media, providing access to the best the bank has to offer, and creating highly convenient journeys across platforms. These capabilities will enhance the stickiness of

core franchises. In particular, digital tools will be used to systematically eliminate pain points in client journeys—for example, around client onboarding. Finally, these banks will use digital tools to migrate lower-value client flows to electronic channels and establish low-cost coverage teams to process their business.

Regarding data, the emphasis for targeted banks will be on getting the basics right. They will focus on consolidating reference data, establishing appropriate governance structures and ownership, and using data to build a deep understanding of client needs and flows to support decision-makers. For targeted banks, some of the client-focused dashboards and reports that result will lack the pizazz of the latest innovations in data-driven algorithmic trading pursued by all-in banks, but they will significantly upgrade the ability of business leaders to allocate time, capital and people to the activities where they will generate greatest value.

Operations and risk. In operations and risk, automation will be a major focus, and targeted banks will explore the same levers as their all-in peers–but for different reasons. For multiregional and national players with lower volumes than larger peers, higher geographic fragmentation, and in some cases, extensive branch networks, automating manual processes across products will help reduce costs despite these complex footprints. While individual initiatives will be linked to specific functions, the overall impact of automation is transformative and leaves the bank with a far more efficient platform (Exhibit 10, page 21).

To ensure that automation efforts succeed, banks will need to ensure that they are genuinely end-to-end. They must ensure that systems, processes and behaviors at the point of trade capture are fit for purpose to realize the full benefits of automation downstream. After all, even the best settlements engine will be of little help if the client is sending a fax.

Finally, many banks will realize that they are not the natural owners of their operations and technology stacks and outsource these entirely, fully variablizing their cost bases, or open up their platforms to outside firms and developers. They will also explore industry utilities where available.

Innovation. Innovation will be critical for targeted banks. However, instead of looking to change their business outright, they will focus on identifying and hedging potential digital disruptions to existing models at the lowest possible cost. Like their all-in peers, these banks will likely take small stakes

Exhibit 10

End-to-end automation has massive potential

Client onboarding	**90%** reduction in turnaround time
Sales	**20 to 30%** time freed up
Trading	Productivity up by **20%** in selected areas
Operations	**80 to 90%** reduction in cost per trade in settlement and reconciliations **40%** productivity gain in ops teams
Risk, reporting & compliance	**40%** productivity gain in product control **~ 80%** reduction in reporting instances

Source: McKinsey & Company

in innovative start-ups and experiment with innovation labs. However, their investment levels will be lower and they will typically take a wait-and-see approach as the market, regulatory and technological environments evolve, committing funds more selectively.

A Significant P&L Opportunity

McKinsey estimates that digitization represents a multibillion dollar opportunity for both all-in and targeted banks over the next five years (Exhibits 11 and 12). The opportunity is split into three components and represents 20 to 30 percent of upside over existing P&L, beyond revenues protected.

For a typical top 10 dealer, 6 to 12 percent of revenues will be at risk from digital in the next five years. The primary driver will be the ongoing electronification of various asset classes still moving to *e*, including interest-rate swaps, equity derivatives and emerging markets FX pairs. Targeted banks will be somewhat shielded from these trends as their typical clients are less likely to transact electronically for these products, but all banks will need to invest in these areas to defend the volumes that will move. Further, new entrants (aggressive electronic market makers at banks and at hedge funds and other external firms) will drive further margin compression, with banks forced to invest in *e* capabilities to drive commensurate volume increases.

McKinsey expects 4 to 12 percent of revenue upside from digitization. For targeted banks, the primary driver will be more effective customer relationship management (CRM) tools and better cross-sell to core franchises. For all-in banks, improved electronic market-making and execution and analytics capabilities driving increased market share in liquid asset classes will be key.

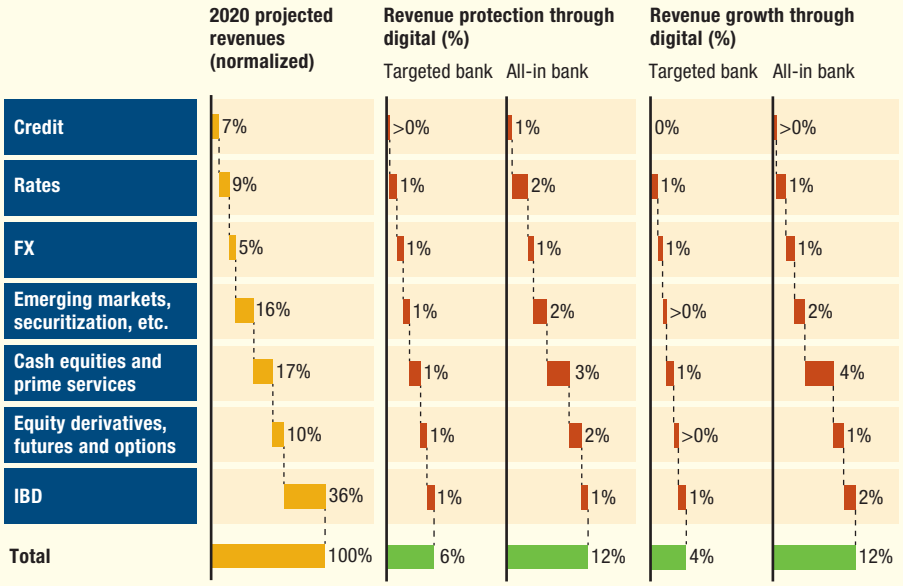
On the cost side, savings of 25 percent on the applicable cost base will be achievable, which translates into a P&L impact of 16 percent at a 65 percent cost-income ratio. Targeted banks will reduce front-office costs through *e*-CRM, structuring tools and low-cost coverage. All-in banks will push the automation of front-office tasks further and actively seek to move transactions to *e* channels, reducing the need for voice staff.

Both targeted and all-in banks will reduce servicing and operations costs by investing in end-to-end automation. Many targeted banks will benefit from the economics of at-scale outsourcing, effectively continuing to pay variable costs in operations and technology plus a margin but eventually exiting many of their fixed costs.

Exhibit 11

Digital value at stake

Potential revenues from digital (to 2020), business view

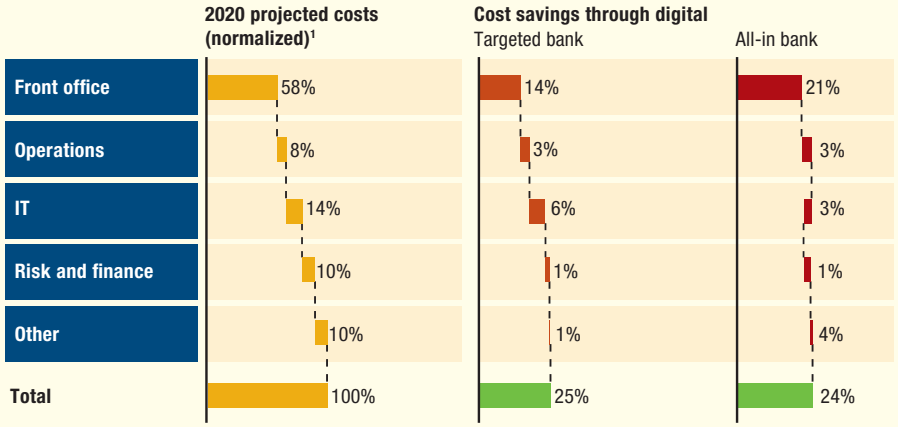


Source: McKinsey & Company; Coalition

Exhibit 12

Digital value at stake: Cost savings

Potential savings from digital (to 2020), functional view



[1] Implicit is an assumed cost to revenue ratio of 65% before savings from digitization.

Source: McKinsey & Company; Coalition

Navigating Disruptive Developments in Digital

Banks, alternative finance companies and technology players alike have embarked on moves to digitize across the sales and trading value chain. There are five clear investment themes. Their impact on banking franchises ranges from purely complementary to disruptive. Apart from investments in simplification and automation—no-regret moves for all banks—targeted and all-in banks will respond differently to these themes (Exhibits 13 and 14).

Simplification and automation

The first theme is continued investment in the simplification and automation of manual processes across the value chain. On the bank side, developments include common RfQs across clients and sales, automation of entity/hierarchy building for onboarding, automation of trade booking and capture, automation of confirmations/affirmations and automation of P&L production and valuation/reconciliation. On the third-party side, new offerings include workflow solutions and smart forms for account opening and onboarding, and tools to capture terms and conditions of collateral agreements to build a rulebook.

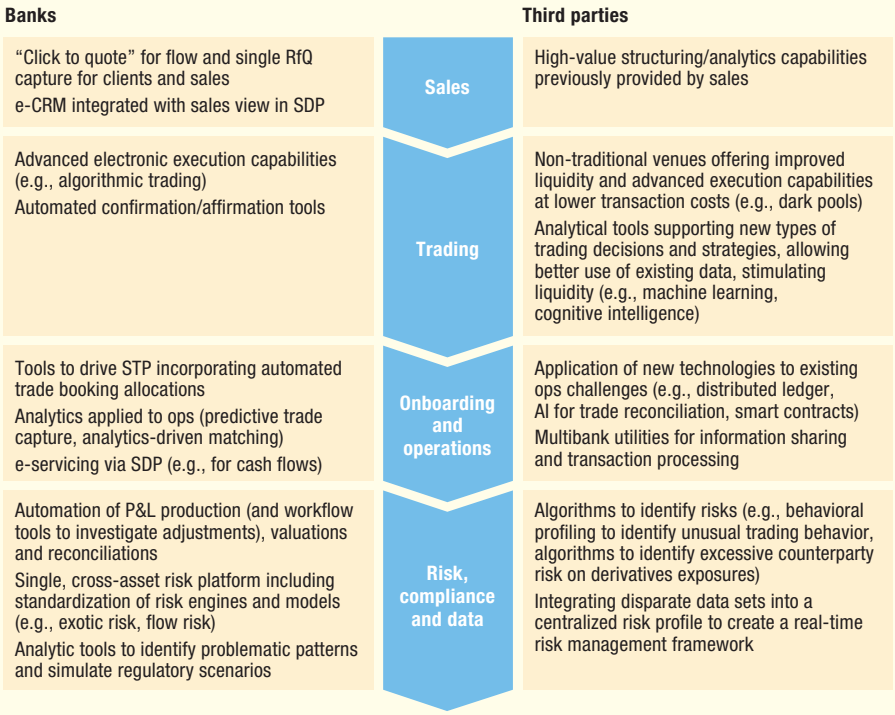
In many cases, the streamlining takes place on the cloud, thereby reducing IT costs for the bank. Examples include cloud-based platforms for negotiating master agreements and cloud-based tools for margining in lieu of Excel spreadsheets.

Multibank utilities can also be important for this type of simplification, for example, by creating an exchange for KYC information that allows banks to reap economies of scale by benefitting from KYC processes completed by other players.

Fundamentally, the majority of these innovations complement banks' current business models. They improve existing ways of conducting business but do not significantly change the activities performed. Banks can simply choose to use the specific services or platforms that make most sense. Given the importance of simplification and automation to both of their business cases, McKinsey expects all-in *and* targeted banks to invest significantly here.

Exhibit 13

Digital innovation across the value chain



New approaches to trading or migrating clients to electronic channels

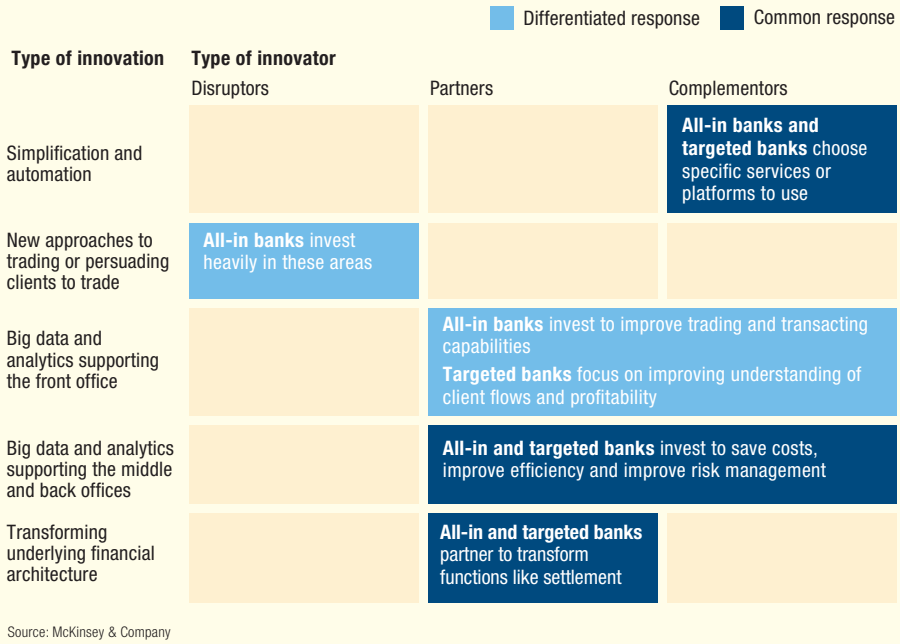
A second set of innovations offers new approaches to migrating clients in ways that are fundamentally different from the current voice business model. The first is the creation of new venues to transact in products not traditionally available electronically from investment banks. Examples include markets for the online trading of private company shares, platforms for corporate bond auctions, or even consumer finance products offered by banks.

Next come innovations in electronic market-making and algorithmic trading, which are continuously refined by high-frequency trading teams at hedge funds and banks alike, and continue to upend traditional market-making.

Finally, banks and third parties alike have invested in analytics and structuring tools, for example to value structured credit products or build structured equity products that allow clients and salespeople to electronically access

Exhibit 14

All-in and targeted banks will respond differently to various types of innovation



Source: McKinsey & Company

value-add capabilities previously provided by structurers, strategists and quants. While not creating new venues or improving trading efficiency per se, they digitize activities that directly drive revenues, are perceived as complex, and were previously the purview of front-office teams.

In contrast to innovations in automation and simplification, these innovations are fundamentally disruptive. They either disintermediate banks altogether, shift which roles matter within banks, or propose new ways of doing business where nonbank players are the primary drivers of value. McKinsey expects all-in banks to drive much of this disruption themselves, organically or by acquisition. In contrast, targeted players will actively monitor developments but avoid big bets unless their client franchises are directly threatened.

Transforming underlying financial architecture

A third set of developments threatens to transform the underlying "backbone" supporting bank processes. The best example is distributed ledger ("blockchain") technology, which, applied to clearing and settlement, for example,

could significantly reduce time spent and cost, increase robustness and allow real-time auditing. (See “Blockchain in capital markets,” page 28.)

Innovators in the distributed ledger space can be seen as partners to banks. They will change core components of the value chain through new technology that banks lack. However, they do not threaten outright disintermediation of banks or radically alter economics. Again, both targeted and all-in banks will engage with innovators in this space, due to the potential for significant cost savings.

Big data and analytics supporting the front office

The next set of innovations concerns the application of big data and advanced analytics across the value chain. When applied to sales and trading, they typically take the form of data mining, machine learning or artificial intelligence used to provide new insights that lead to a trade idea. Developments here range from better *e*-CRM to tools that predict the impact of an event like an oil price spike on a stock by analyzing previous historical instances or tools that analyze market sentiment.

Innovations in this area tend to require partnerships between banks and third-party players or are complementary. Again, they do not threaten outright disintermediation of banks or radically alter economics. With the exception of *e*-CRM, most of the bank involvement in these areas is likely to come from all-in banks looking to stimulate electronic volumes and support new means of execution.

Big data and analytics supporting the middle and back offices

Some of the most interesting advanced analytics applications concern middle- and back-office processes. In operations, analytics can be used to drive predictive trade capture or improve reconciliations and root-cause analysis. In risk, increasingly sophisticated tools can be used to flag financial and operational risks early. Again, these innovations are either complementary or require partnerships between banks and third-party firms. Because of their potential to improve the results of simplification and automation, McKinsey expects to see investment by both types of banks.

Blockchain in capital markets

A blockchain is a distributed public ledger for recording transactions that obviates the need for a central party to maintain the database and eliminates the chance of a single point of failure. Known until now for its association with Bitcoin, blockchain technology is being considered for its other applications to finance, in particular as an advanced settlements architecture, but also for complex asset transfers and transaction messaging.

There are a number of advantages to blockchain relative to proprietary, centralized ledgers. A distributed network obviates the requirement for a central bookkeeper and allows the network participants to verify transactions without trust or credit intermediation. Records logged in a blockchain are cryptographically secured from revision and offer proof of ownership, while the consensus protocol ensures that a digital asset cannot be spent more than once.

Settlements is the area within capital markets where blockchain is expected to have the largest impact. Increased speed—settlement times could be cut from T+3 to T+0 (five to ten minutes), significantly reducing settlement risk—improved security, better convenience through the facilitation of bilateral trading, and lower cost are all potential benefits. Other use cases are for complex asset transfers (as any party would be able to access and verify ownership records) and transaction messaging (vital transaction information can be embedded into the blockchain transaction).

Challenges remain before blockchain technology can be implemented wholesale into financial markets, however. Agreement will be needed on the digital representation of non-standard securities, while pointers to external data may be required in the case of complex securities, as the current Bitcoin blockchain has a limited block size. “Smart contracts,” which include code to control additional actions, will also need to be implemented. As transactions are irrevocable, transfers can only be reversed and not amended, which may require agreement on a formal recourse mechanism. In its current state a separate wire system will have to be maintained for cash transfers, barring the digitization of cash.

Despite these challenges, given the potential improvements that blockchain technology could precipitate, CMIB businesses must decide how to participate. All-in banks could look to develop their own technology and protocols within an innovation lab, while both all-in and targeted banks could invest in fintech companies occupying this space. A third approach would be to monitor the space for first-follower advantage.

Making Change Happen

Beyond managing innovation, both targeted and all-in banks will need the right governance structure to address issues of incentives and culture, and the appropriate IT architecture.

- **Governance.** There are four models for managing the delivery of digital strategies in capital markets, ranging from full decentralization to parallel teams. For targeted banks where electronic offerings are primarily concentrated within one product or client segment, a decentralized approach, with innovation managed primarily by the relevant team, can succeed. However, for the majority of banks, both targeted and all-in, some degree of central organization is required to align approaches across different product areas and ensure delivery. Experience suggests that firms with more centralized models have a better chance at pushing through inertia, avoiding duplication of activities and developing a coherent strategy.
- **Architecture.** To support their digital efforts, banks need to ensure that the underlying IT architecture is fit for purpose. For most banks, this will require adopting a component-based approach that is flexible and relatively easy to adapt to new requirements. Client experiences will need to be consistent across channels and devices. Finally, data will need to be managed appropriately, with mechanisms to ensure integrity, avoid duplication and define golden sources.

Four immediate priorities

Regardless of whether they see themselves as all-in or targeted in their approach to digitization, there are four immediate priorities for all banks as they plan their digital future.

1. **Define digital strategy.** Banks face stark strategic choices as they plot their digital approach. Articulating an *e*-trading strategy across businesses and products that reflects the bank's footprint and relative strengths and weaknesses is critical for success—and often counterintuitive. To develop

and support this strategy, banks must run front-to-back diagnostics to create a digitization roadmap, define a cross-bank data and analytics strategy, identify key partners and define the high-level front-to-back architecture model.

2. **Build digital capabilities and operating model.** After defining their overall strategy, banks need to build the cross-cutting digital capabilities required for digital transformation. These include investments in connectivity to appropriate execution venues and clearing facilities, trade and RfQ capture, *e*-CRM, and advanced analytics and work-flow solutions across functions.

   Banks also need to define their approach to digital governance, establish a framework to measure performance and ensure that digital teams are integrated with other bank areas. They also need to identify any gaps in digital talent and bring the relevant skills into the organization.

3. **Implement "no regret" digital transformations.** Regardless of their ultimate ambition in the digital space, nearly every bank should pursue end-to-end automation. The most successful programs focus on three to four areas based on criticality to the franchise and value at stake. They often include processes like client onboarding, OTC manual confirmations, listed derivatives trade processing, and loan syndications. After these initial pilots, the bank can build the capabilities for a broader roll-out. (See "End-to-end digitization in capital markets banking," page 32.)

4. **Fuel the innovation pipeline.** Whether they are themselves driving innovation or acting as fast-followers, staying connected to the digital ecosystem and monitoring potentially disruptive technologies is critical for all banks. To manage innovation, they need to set up the appropriate venture arms and innovation labs, establish clear guidelines for each, and periodically consider strategic acquisitions and partnerships. (See "Managing innovation," page 34.)

* * *

The value at stake from digitization in capital markets is significant enough that no bank can afford to maintain the status quo. All banks must invest in a range of digital initiatives, across sales and trading, operations and risk, and innovation.

It is crucial, however, for banks to determine which of the two routes to digitization best suits their current situation. For a few banks with a strong propensity for electronic trading and a proven track record in digital initiatives, the only path forward is to go all-in with a comprehensive strategy. The remaining banks will be better served by taking a more measured and targeted approach, protecting client franchises and reducing operating costs. Fortunately for the vast majority of banks in this second category, a targeted approach promises to deliver profit and loss improvements on a par with those of the all-in banks. And all banks will find that investment in end-to-end automation of the value chain is a “no regret” move that drives significant value.

End-to-end digitization in capital markets banking

End-to-end digitization combines the best of classic lean- and IT-driven automation approaches in simplifying processes and reducing cost. Lean efforts have been effective historically, but are often limited by technology constraints, require effort to maintain and will sometimes not scale easily into new areas. Meanwhile, IT-driven automation initiatives, while often effective, sometimes lack sufficient business input and can be complex to build.

End-to-end digitization merges the two approaches. The function in question is rebuilt from a zero base with both process and technology components in scope. Teams move quickly to deliver the minimum viable product and improve it iteratively through continuous testing. The product is then scaled quickly across multiple areas.

Banks applying this approach often capture efficiencies in excess of typical cost or automation programs based on the broader scope of the effort. They can also greatly enhance staff or customer experiences by significantly reducing the amount of time and effort involved in normally onerous interactions.

When applied to the onboarding process at a national bank, end-to-end digitization reduced onboarding times by more than 95 percent, required data points by more than 85 percent, and the number of bank-client interactions from more than 25 to 3. The bank achieved this by simplifying and automating internal policies and procedures and reducing the number of teams and handovers. An onboarding hub, as the single point of client interaction, was introduced, and prepopulated paperless documentation was used.

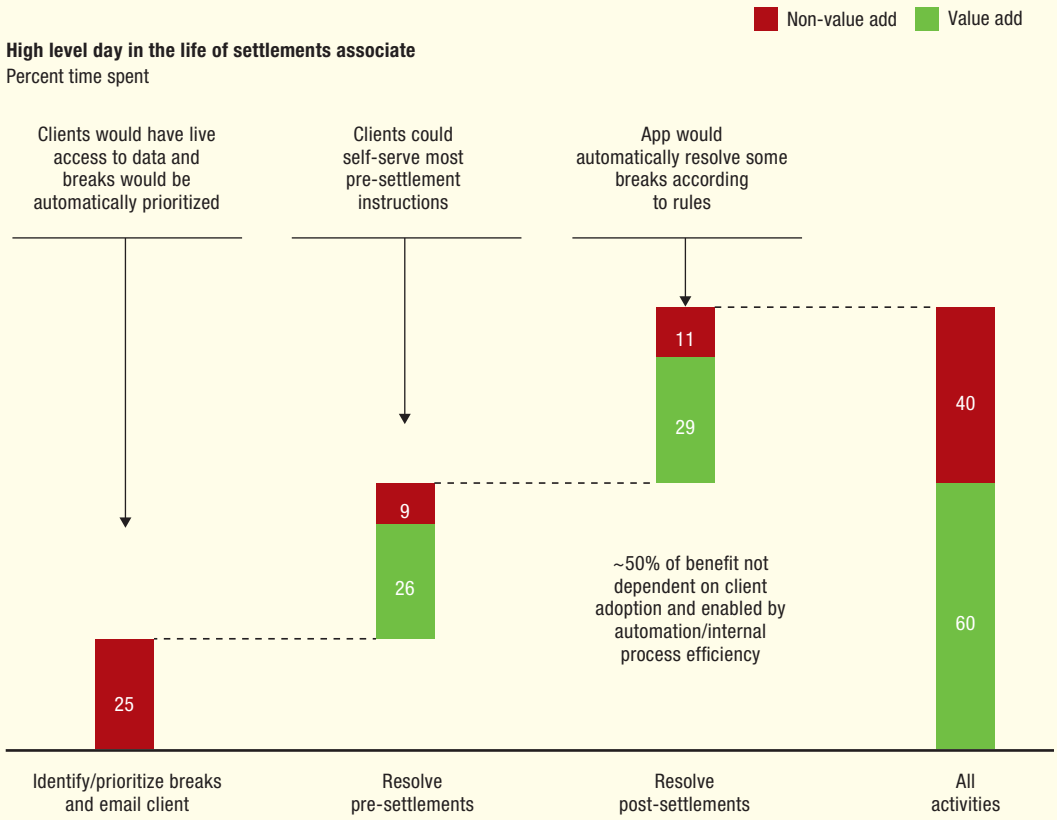
When applied to the derivative settlements function of a leading global bank, a roughly 40 percent improvement in productivity was achieved—on a process that had already been through a lean redesign. The key levers were reducing complexity in a highly fragmented and manual process and introducing an app to automatically resolve some breaks according to pre-defined rules (Exhibit A, page 33).

A number of areas within capital markets business are candidates for piloting end-to-end digital redesigns. Moreover, once adopted in a particular area, the capability to drive such initiatives can be incubated and rolled out across many parts of an organization.

(continues on next page)

Exhibit A

End-to-end digitization drove ~40% productivity improvements on a settlements process that had previously been through lean redesign



Source: McKinsey & Company

Managing innovation

The digital ecosystem is complex. In addition to banks, private equity funds, venture capital firms and technology companies are among the types of companies tackling the applications of financial technology to capital markets.

E-commerce teams housed within capital markets monitor these developments at most banks. In addition, some banks set up innovation labs and dedicated venture teams to stay on top of technological change.

The precise structure of innovation labs varies firm by firm, but they typically share a number of features. They are usually stand-alone units and are sometimes located in technology hubs (Palo Alto, Berlin) not typically associated with finance. They will often involve some form of partnership, whether with a specific technology company, universities or the start-up community more broadly. Their objectives will always include acting as a conduit connecting the bank to "out of the box" thinkers and technologies that might not get sufficient attention from bank professionals focused on driving the day-to-day business. In many cases, they will incubate promising ideas and technologies and accelerate their development to commercial applications.

Other firms have chosen to create dedicated in-house venture teams. Functioning much like a Silicon Valley venture fund, these teams seek to make investments in fintech companies. In some cases, the funds have focused on investments specifically relevant to capital markets (e.g., ultra-low latency telecommunications, online broking, automated and algorithmic trading systems). In other cases, their remit is broader and they will invest in "classic" fintech sectors as well, such as payments and online lending platforms.

Ensuring that innovation labs and venture teams function well is mission critical for both all-in and targeted banks. These teams will keep banks connected to potentially disruptive technologies and create an environment where banks can react with sufficient speed to external developments. It is typically difficult for existing business lines, where day-to-day operations often dominate management time, to do this as well.

Consequently, it is crucial to ensure that teams dedicated to innovation are staffed appropriately, have clear guidelines on where to focus, enjoy sufficient freedom to experiment, and are well connected to the broader organization to quickly accelerate new ideas.

Glossary

Axe. A trade that a trader would like to execute. Usually involves selling a position from dealer inventory, covering a short position or buying a new position to gain exposure to a certain risk.

Central limit order book (CLOB). A fully transparent centralized database of limit orders where the cheapest offer and highest bid constitute the current live market. A CLOB allows dealers and customers to see the depth of the market and to trade with any other counterparty showing a price.

Dark pool. A private forum for trading securities, most usually equities, away from a public exchange. Dark pools are often formed from a broker's or dealer's order book and can include other sources of liquidity such as private banking flows. They differ from CLOBs in that liquidity within a dark pool is opaque: no market depth is displayed. This allows for trades to be executed confidentially with little public market impact and with lower transaction costs.

Depth. The size of an order required to move a market by a given amount. In practice it is the number of orders and sizes at given prices around the current live market.

Electronic flow. Orders that are sent by clients electronically for execution on-screen either on a single-dealer platform or multidealer platform. Electronic flow consists of both agency and principal transactions and includes multiple pricing protocols including live streaming and RfQ.

***e*-Sales.** Sales activity consisting of monitoring client activity via electronic channels and intervening where necessary (e.g., high activity, low hit ratios). *e*-Sales teams also help with client onboarding and ongoing support.

Exchange. A public, highly organized market for securities, bringing together brokers and dealers. It consists of an order book for each security that is listed on that exchange.

High-touch client. A client that is highly resource-intensive to dealer coverage. These clients require a full set of value-add services including idea generation and research. A high-touch client generates both high-touch and low-touch flow and often requires electronic channels from a bank as a pre-condition to winning block trades.

High-touch flow. Trading flow that is resource-intensive for dealer coverage. Orders are usually taken over the phone or via email or instant message and input into sell-side systems by client coverage. Often preceded by interaction regarding idea generation, market discussion, axes and execution considerations, and typically involving larger ticket sizes, more complex trades and the taking of principal risk.

High-touch sales. Intensive sales activity requiring frequent telephonic, face-to-face and chat conversations around idea generation, market conditions and client strategy. High-touch sales engage in this activity with five to fifteen high-touch clients on an ongoing basis in order to win valuable business.

Internal crossing engine. An algorithm that matches client buy and sell orders within a dealer.

Low-touch client. A client that requires lower resource intensity from dealer coverage. They are primarily focused on execution and pricing with little use of value-add services. Low-touch clients, whose trading may be episodic, are happy to use electronic channels as long as they are completely STP.

Low-touch flow. Trading flow that is not resource intensive for dealer coverage. Orders are usually taken over the phone or via email or instant message but require little or no value-add from sales other than passing on the request to the trading desk. Low-touch flow often comprises smaller ticket sizes and could be migrated to electronic channels with little impact on the client franchise.

Low-touch sales. Less intensive sales activity that requires telephonic, face-to-face and chat conversations around idea generation, market conditions and client strategy. Low-touch sales engage in this activity with 15 or more low-touch clients on an ongoing basis. They also engage in tactical follow-up with clients based on CRM prompts and automated alerts.

Multidealer platform (MDP). A venue where customers can access pricing and liquidity from multiple dealers and brokers at the same time. MDPs are usually limited in terms of the value-add services that are offered.

Multilateral trading facility (MTF). A non-exchange trading venue operated by an investment firm or market operator, as defined by the Markets in Financial Instruments Directive (MiFID). There is no discretion in the way buying and selling interest can interact. An MTF is a type of MDP.

Organized trading facility (OTF). A venue that captures trading in instruments other than equities that do not take place on regulated markets or on MTFs, according to MiFID II. Operators of OTFs have discretion on how order-matching occurs, subject to transparency obligations. Own account trading and matched principle trading can be allowed. An OTF is a type of MDP.

Request for quote (RfQ). A customer request for a dealer to show a bid or an offer in a particular security for a given size. An RfQ can be sent bilaterally via voice, message or chat channels, or may be sent to more than one dealer for participation in a sealed-bid-auction process.

Swap execution facility (SEF). A facility, trading system or platform for regulated swaps trading in the U.S. Mandated by Dodd-Frank, SEFs attempt to bring OTC swaps trading into a more transparent public domain where bids and offers, and their relevant sizes, are available to all market participants, while providing a complete record and audit trail of transactions. A swap listed on an SEF may be traded on the SEF, but may also be traded off-SEF in any lawful manner. An SEF is a type of MDP.

Single-dealer platform (SDP). A platform that integrates trading, pricing, research and technical analysis from one dealer into a single user interface. SDPs often include significant value-add services beyond execution.

Straight-through-processing (STP). A process that allows for an entire trade settlement process to be captured electronically without manual intervention. STP requires electronically linking an institution's front and back offices with the front and back offices of the trade's counterparty. It reduces the time, costs and risks associated with traditional settlements.

Further insights

McKinsey's Corporate & Investment Banking Practice publishes frequently on issues of interest to industry executives. Our recent reports include:

McKinsey Working Papers on Corporate & Investment Banking, No. 9: Boosting Front-Office Productivity In Capital Markets
April 2015

McKinsey Working Papers on Corporate & Investment Banking, No. 8: Leveraging the Digital Potential in Corporate Banking
February 2015

McKinsey Working Papers on Corporate & Investment Banking, No. 7: Fixed Income, Currencies and Commodities in Asia: Competing in a Shifting Landscape
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