# FORTUNE FAVORS THE BRAVE

## THE FIVE-YEAR OUTLOOK FOR THE SELL SIDE

INSIGHT REPORT

# Contents

# Highlights

According FIS' survey of 464 sell-side executives from around the world, the sell-side industry faces a massive **restructuring** influenced by a combination of strict new regulations, increased competition, demands for improved trade transparency and multiple technological innovations. Taken together, these trends have the potential to severely undermine existing **revenue models**.

Increased **automation** is expected to impact the businesses of 84 percent of our respondents. The automation of data collection, processing and reporting are likely to play critical roles in helping firms to cut their costs, comply with regulations, satisfy clients and remain competitive in the marketplace.

Seventy-nine percent of respondents expect **algorithms** to take an increased share of trading and transactional activities. Algorithms could help to make more sophisticated services available to new markets and to execute an increased share of investment decisions and compliance processes behind the scenes.

**Startups** that are lean, agile and highly automated are well prepared to compete with established players, especially if they can focus on profitable activities and use technology to cut costs and attract clients.

**Incumbents** are at risk of losing profitable markets because of a combination of increased regulation, technological barriers to entering new markets, complex working practices and the difficulties associated with integrating legacy systems and staff with the latest technologies. Incumbents may need to partner with the best startups in order to access the latest skills, talent and technologies and then to outsource as many non-core activities as possible.

# Executive summary

## Introduction

Emerging technologies are enabling automation and outsourcing throughout the sell-side industry. These technologies will not just reduce costs but play important roles in helping banks and broker-dealers generate new revenue, produce reports for clients and regulators, and reduce the costs of human error and fraud.

Understanding these developments – along with the underlying business and regulatory trends – will be essential if sell-side firms are to remain competitive in the years ahead.

Not only must firms decide which lines of business remain viable and which technologies are suitable for them, they will also need to understand how to connect systems without undue complexity and how to consolidate them in order to generate cost savings and fresh commercial opportunities.

## The compliance challenge

Compliance is a huge and growing challenge for the entire sell-side industry, with a raft of new regulations scheduled to take effect over the next few years and budgets under constant pressure. Large compliance teams are currently needed throughout the sell-side industry and may still need to grow, despite their jobs being largely repetitive and prescribed. New technologies that make it easier to automate and outsource burdensome compliance obligations could help save firms substantial amounts of time, money and effort. Technology can also help firms respond to demands for trade transparency.

## Automation

The automation of the sell-side industry's repetitive, low-value, time-consuming and complex tasks could free personnel to focus on more valuable activities. Automation may also make it economical to offer sophisticated existing services to new markets or lower-value clients, and to invest in new services that are not currently viable.

## Outsourcing

In a bid to cut costs and add value, many firms are interested in outsourcing as many non-core activities as possible in their front, middle and back offices.

To an extent, the latest e-trading and e-brokerage platforms already demonstrate that modern technologies can replace traditional sales and trading roles. In the middle and back offices, lower-profile but important roles such as risk management, treasury, compliance and reporting are all prime candidates for outsourcing.

Related issues such as data privacy and cybersecurity are important concerns across all offices, as they can be difficult to maintain to a high standard in-house and may benefit from external assistance.

**75 percent of our respondents say they expect regulations to significantly change their revenue model.**

## Disconnects

One major disadvantage of the sell-side industry's increased reliance on new technologies and increasingly sophisticated operations is that traditional decision-makers often don't possess advanced technical skills and judgement alongside with their usual business skills. Unless those funding new systems understand why specific safeguards, architectures and budgets are required or desirable, it may be difficult to secure and replace complex legacy systems with new streamlined systems that do a better and faster job.

It may also be difficult to train more junior staff with specialist skills, such as advanced coding, and we anticipate that data scientists are going to become as strategically and financially important to firms as successful brokers-dealers and bankers already are.

## Structural change

To date, it has proven difficult for small and highly innovative startups to disrupt the sell-side broker-dealer and banker markets. However, many are busily identifying the most promising market segments and doing their best to find investment and scale up.

Insiders with market knowledge and relationships with clients are particularly well placed to become the founders of commercially viable startups, and big firms may start to co-finance startups based on the latest technologies and business models as a defensive strategy.

Although no large multinational firms yet look threatened by any new startup, the incumbents would all be well advised to monitor how the startups are connecting the latest technologies together in ingenious and efficient new ways, collaboratively developing and sharing complex code and finding new growth, markets and data.

In addition, as established revenue models come under increased scrutiny from regulators and clients, it is likely that old revenue models will start to fail. Large firms in particular must become more nimble at adopting new technologies and business models before their competition.

Ultimately, sell-side firms of all sizes will need to be brave, agile and technology-focused if they wish to adapt and thrive in this challenging and competitive market.

# Key findings

**The regulatory rebound**

Nearly a decade after the financial crisis, the deluge of regulations continues, and many new requirements will take effect in the next couple of years.

In our survey, 77 percent of all respondents say they expect their business to be severely impacted by regulations within the next 24 months (see Figure 1). This indicates that the industry is about to enter a period of intense regulatory upheaval at the same time that it's being disrupted by an array of new technologies.

Moreover, an emphatic 75 percent of our respondents say they expect regulations to significantly change their revenue model (see Figure 2a). Some large and profitable activities may impose considerable compliance costs and even stop certain activities from being profitable, with reduced commissions also meaning that new revenue models are expected to be necessary.

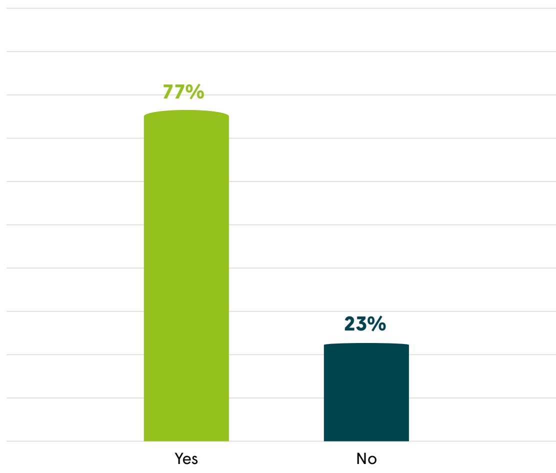



Figure 1: Do you expect increased regulation to severely impact your business in the next 24 months?

DATA FOR ALL CHARTS IS BASED ON A SURVEY OF 464 SELL-SIDE EXECUTIVES CONDUCTED BY LANTERN INSIGHTS IN JULY 2016. NUMBERS MAY NOT TOTAL 100 PERCENT BECAUSE OF ROUNDING.

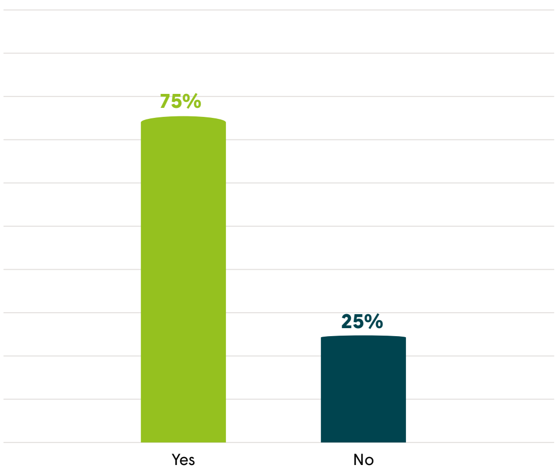



Figure 2a: Do you expect regulation to significantly change your revenue model?

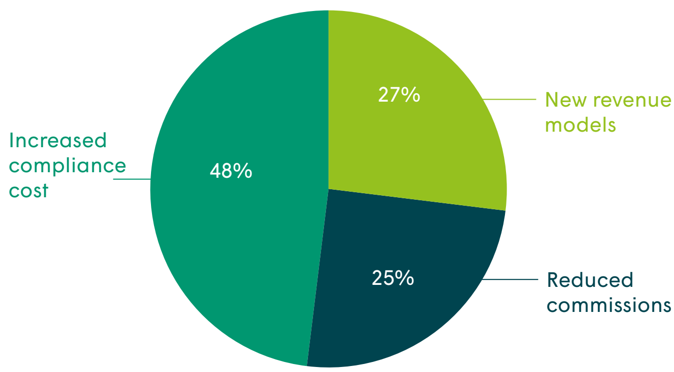



Figure 2b: If you answered yes, how?

### The biggest worry: Data privacy

In terms of specific regulations, data privacy is the top concern of 30 percent of respondents (see Figure 3). This makes sense given that high-profile data breaches have harmed the reputations of major companies around the world, and regulators are moving to reassure investors.

> "There are a lot of requirements that we have to comply with, and how we do this can have a huge impact in our capital."
>
> Alfonso de Lara Haro
> deputy director general of financial and operational risks
> Grupo Financiero Banorte

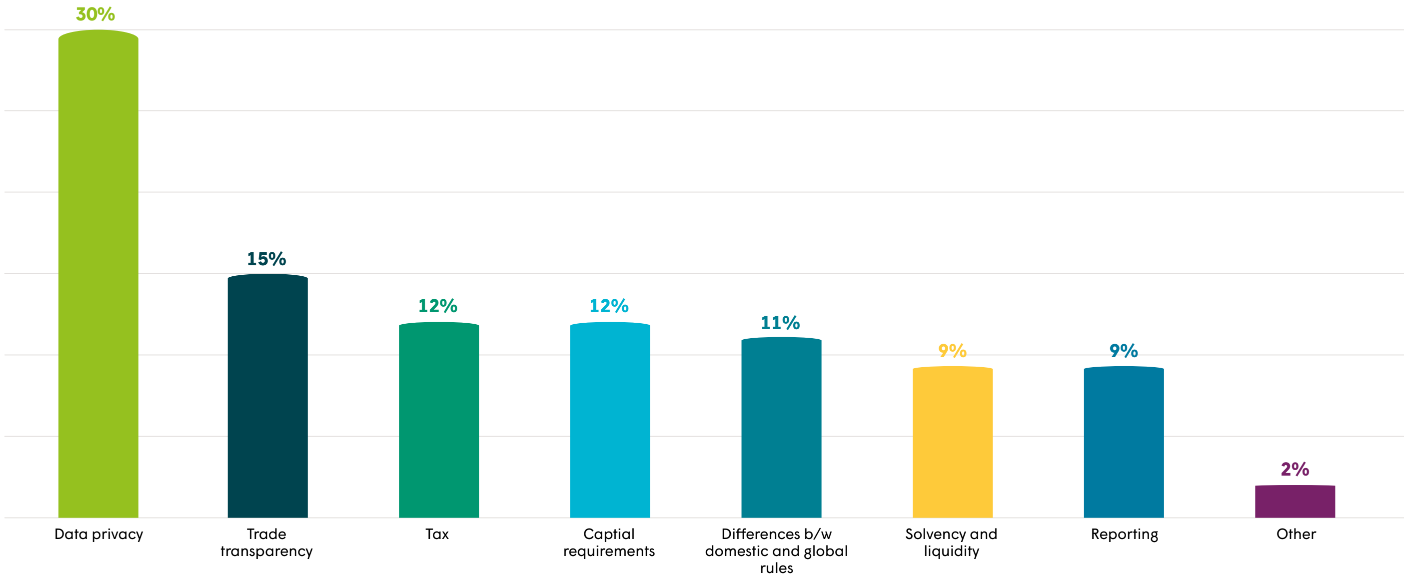



Figure 3: Which area of regulation concerns you the most?

If a firm's data is compromised, the firm stands to lose not only money but also the confidence of clients and its reputation. There is substantial reputational risk around this, given the media's interest in hacking and data protection. In an era where customers can change providers more easily than they could in the past, if they feel that their provider of financial services doesn't have a strong and secure infrastructure, they'll change providers very quickly. While these expectations typically stem from individuals' retail experiences, it's quickly becoming applicable to the institutional space as well.

At the same time, banks must hold ever more private data on their customers in order to monitor and protect against financial crime and money laundering, assess their suitability as customers (as part of the Know Your Customer principle) and comply with other regulatory requirements.

As a result, many sell-side firms are being forced to thoroughly and seriously examine the whole of their operations and do more to identify vulnerabilities before hackers can exploit them. So, while all of these compliance requirements are a burden on firms, they also provide a golden opportunity to update data protection processes in ways that are likely to pay rich dividends by improving productivity, simplifying compliance and maintaining confidentiality.

### A multitude of concerns

Many areas of regulation cause the sell-side industry concern, ranging from trade transparency and changes to tax codes to capital requirements and differences between domestic and global rules, to name only a few. While these forms of regulation appear to be much less of a concern than data privacy, together they reveal the variety and scale of regulations that firms have to comply with and prepare for.

Managing this combination of regulatory risks is further complicated, because markets and jurisdictions vary in their requirements. Again, technology has the potential to help with automatically repurposing and repackaging data as it is needed.

### Modernizing compliance

Adopting the latest technologies would not only enable the sell-side industry to improve the accuracy of asset and liability positions, hedging and performance metrics, but also to manage the market's rapidly expanding regulatory and administrative burdens in ways that free significant amounts of time.

With regulatory reporting requirements for trade and post-trade processes becoming incredibly complicated, compliance is considered particularly well suited to various new forms of automation.

**BROKER-DEALERS VERSUS BANKERS: REGULATIONS**

Seventy-seven percent of respondents say they expect increased regulations to severely impact their business within the next 24 months. When we broke this summary down, we found that this is the opinion of 69 percent of broker-dealers and 81 percent of bankers (see Figure 4). Thus, bankers are much more concerned about the impact of increased regulation on their business over the next 24 months than their broker-dealer peers.

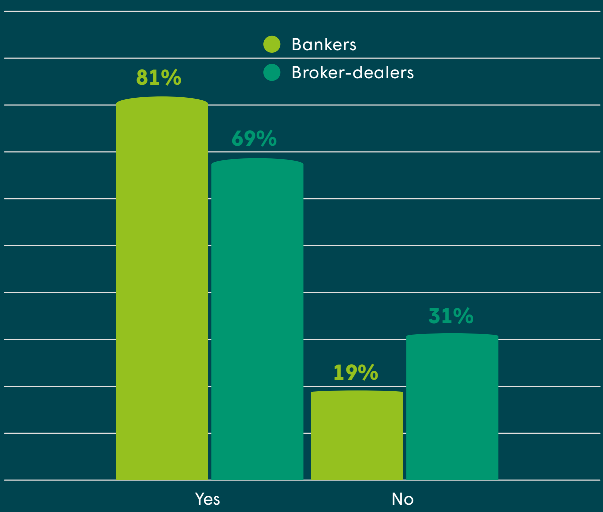



**Figure 4: Do you expect increased regulation to severely impact your business in the next 24 months?**

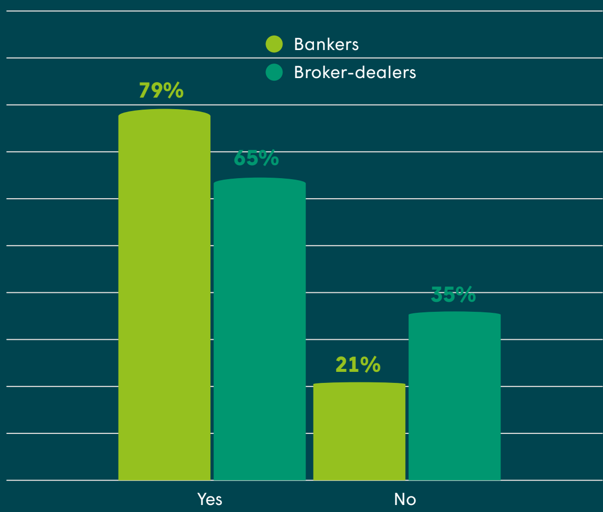



**Figure 5: Do you expect regulation to significantly change your revenue model?**

Almost two-thirds of broker-dealers (65 percent) feel that regulation will significantly change their revenue model (see Figure 5). This high percentage indicates that broker-dealers largely believe that stricter regulations are a threat to valuable activities.

An even higher percentage of bankers (79 percent) feel that regulation is going to significantly change their revenue model, indicating that whole areas of today's banking business may be lost with no obvious substitute business yet developed.

Craig Costigan, division executive, Risk, Compliance and Global Securities , FIS, explains, "In some cases, the response to regulation is not to bring in some technology and produce a bunch of reports for regulators. The response can be to get out of certain businesses...because the regulatory – and particularly the capital impact – can be too expensive for them."

The survey findings suggest that the economic viability of both communities could be fundamentally imperilled by stricter regulation. Moreover, the effect could be fast as both expect a severe impact within 24 months. Bankers involved in high-risk activities dependent upon weak regulation, low capital requirements and cheap money may be particularly vulnerable to change.

### The whole truth and nothing but the truth

While regulators are demanding enhanced data privacy and cybersecurity, the sell side's customers are also starting to expect increased openness in the form of trade transparency.

Trade transparency refers to the demand for greater transparency on the fees and processes that service providers use to undertake trades. The adoption of new technologies could play an important role in helping firms to remain cost-competitive, profitable and compliant in the face of demands for openness from both clients and regulators.

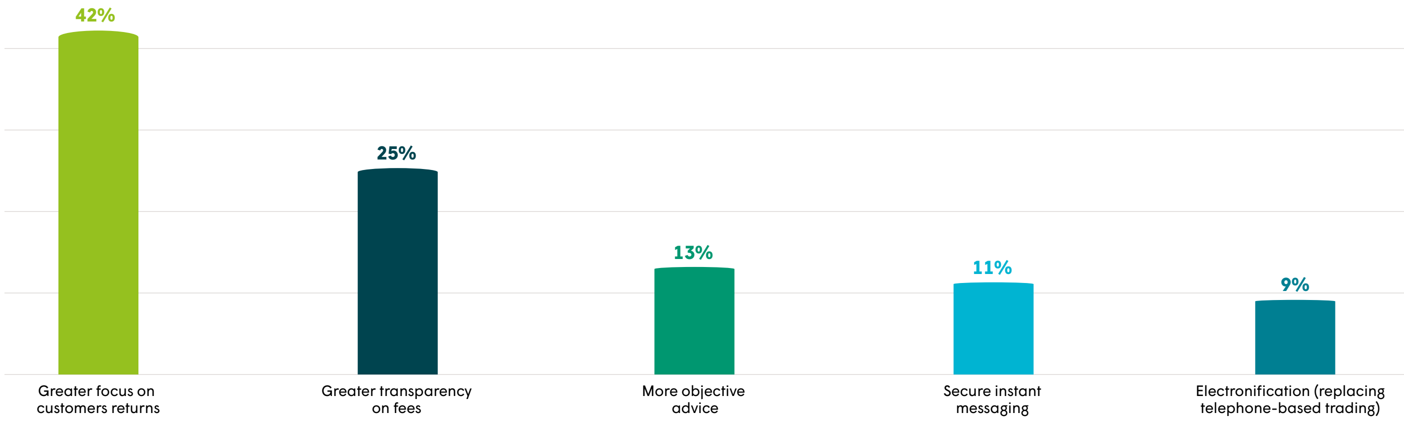



Figure 6: How can bankers and broker-dealers work better together?

In our survey, broker-dealer and banker respondents agree that they need to work together in a number of different ways (see Figure 6). In particular, a greater focus on customer returns is needed alongside greater transparency on fees. Together, these two measures would help demonstrate the value for money of services rendered and the business case for cooperation.

The fact that 13 percent of respondents highlight the need for more objective advice reflects that how consumers lost trust before and after the recent financial crisis. As a result, customers are now asking for far more detail on what they are paying for and how services are delivered.

Firms will have to re-evaluate their entire business strategies over the next few years. This will include rethinking the types of products they provide, the technology they operate and their exposure to regulatory risks in a world where their trades and transactions are increasingly transparent to regulators and clients.

### Automating to add value

A substantial 84 percent say that they expect automation to impact their businesses (see Figure 7). This suggests that a very large proportion of business activities could be automated, and high value and repetitive tasks currently performed by people could be augmented or replaced by technology.

### Do we need the front, middle and back offices?

A significant majority of respondents also expect automation to reduce the need for the front, middle and back offices (see Figure 8). This indicates that all offices are likely to experience significant levels of disruption as firms introduce new technologies that begin to augment or replace existing staff.

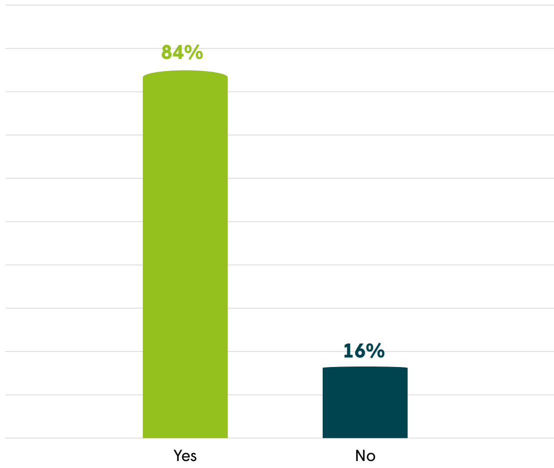



Figure 7: Do you expect increased automation to impact your business?

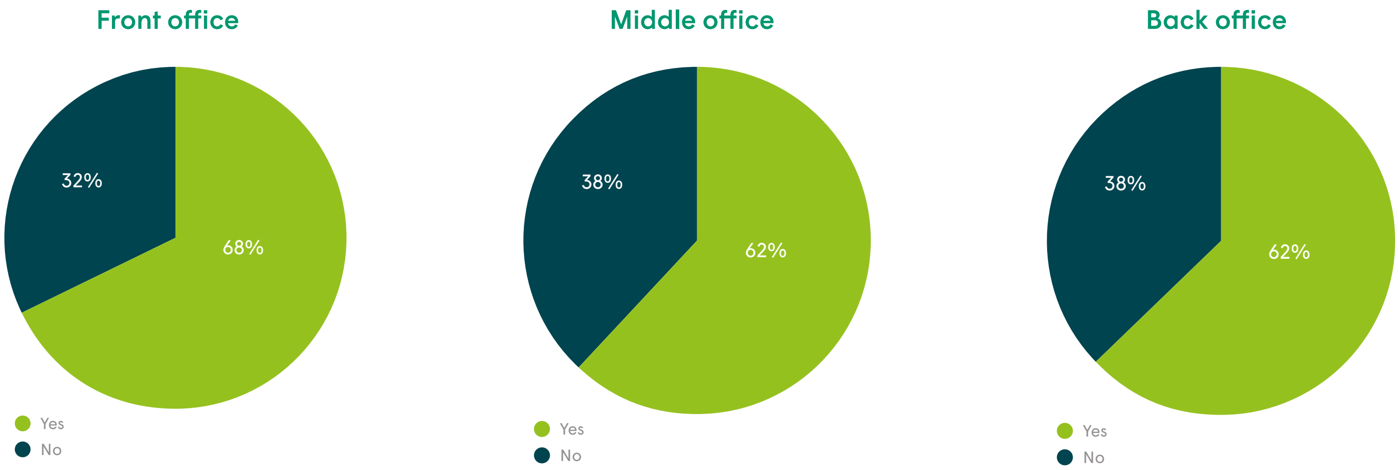



Figure 8: Do you expect automation to reduce the need for front, middle or back offices?

The high expectation that the **front** office will be automated indicates a move towards electronic trading. Over time, the increased use of online platforms and automation, including artificial intelligence and execution algorithms, could fundamentally recalibrate the traditional sales and trading model, which has typically revolved around the use of telephones and close personal relationships.

The **middle** office's strategic, treasury and risk management functions appear hardest to automate, although nearly two-thirds of respondents still believe it will happen. Even so, the ability to automate the middle office is not very different to the front (-6 percent) or back office (-1 percent). Perhaps these perceptions reflect a feeling that front and back offices contain more obvious and immediate opportunities for automation in areas such as trading and reconciliation.

The **back** office is usually considered the most likely to be automated, and the lower likelihood of being outsourced (see Figure 17) could indicate that bankers and broker-dealers know that they have complicated, bespoke or confidential activities and strategies that may be difficult to outsource with confidence or ease. However, now the industry is looking to move towards an industrywide utility model, back-office activities could be increasingly affected.

## Automation remains key to staying competitive in a global market.

**BANKERS VERSUS BROKER-DEALERS: AUTOMATION**

When it comes to technology, a high percentage of broker-dealers expect increased automation to impact their business, but again, bankers expect to be especially impacted by automation (see Figure 9).

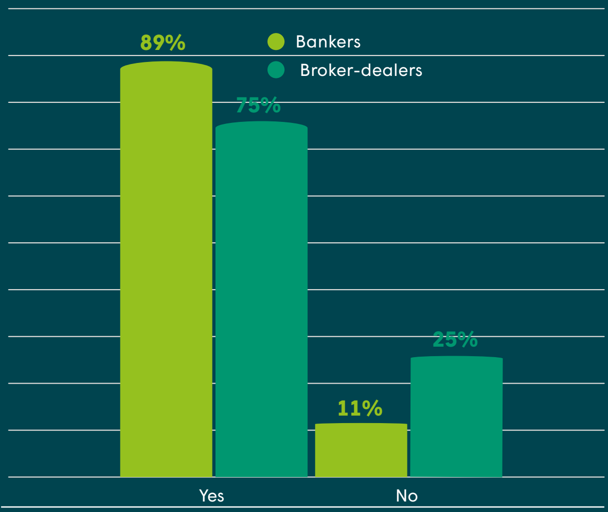



**Figure 9: Do you expect increased automation to impact your business?**

Among broker-dealers, there is high level of agreement that automation will impact roles in the front, middle and back offices. The middle- and back-office results indicate that this might affect those areas slightly more than the front office (see Figure 10).

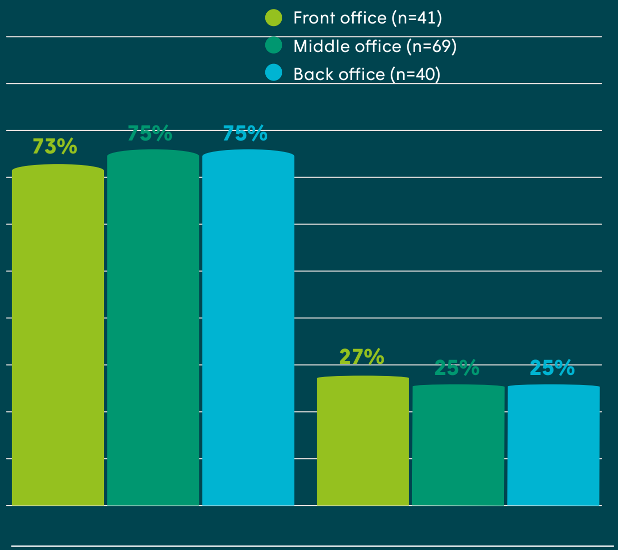



**Figure 10: Broker-dealers: Do you expect increased automation to impact your business?**

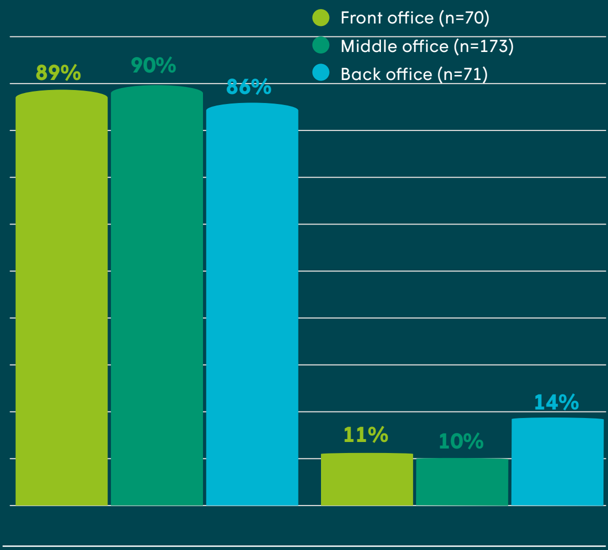



**Figure 11: Bankers: Do you expect increased automation to impact your business?**

Substantially higher percentages of banking respondents agree that the front, middle and back offices will be impacted by increased automation (see Figure 11). These were among the strongest responses of the entire survey.

Bankers expect to automate more of their activities for many different reasons, including improvements to their sales, data collection and analysis, and cash optimization. However, the goal is consistent: to free up remaining staff to focus on their core competencies and add as much value as possible.

### An increase in algorithms

One of the more sophisticated and important types of automation that could affect the sell-side industry includes the use of algorithms, which can automate a wide range of activities. Seventy-nine percent of respondents expect algorithms to undertake an increased share of trading and transactional activities in their business (see Figure 12). Such a high level of algorithm use could expose regulatory and oversight issues.

**Juerg Blattner, head of development trading platform for Zürcher Kantonalbank, is unsurprised by these results. "Automation is definitely the higher topic for us," he says. "The percentage for automation increases each year in our processes, and it is becoming more important."**

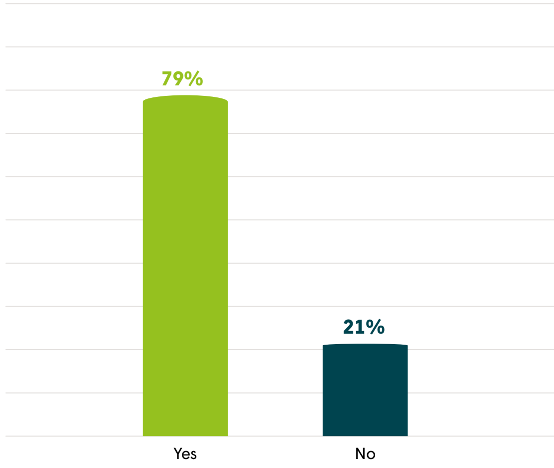



Figure 12: Do you expect algorithms to undertake an increased share of trading and transactional activities in your business?

**BANKERS VERSUS BROKER-DEALERS: ALGORITHMS**

One interesting kink in the narrative that technology is about to disrupt financial markets is that established broker-dealers still rely on telephone calls and human relationships for a large proportion of their business.

This may help to explain why fewer broker-dealers expect algorithms to undertake an increased share of trading and transactional activities than bankers do (see Figure 13).

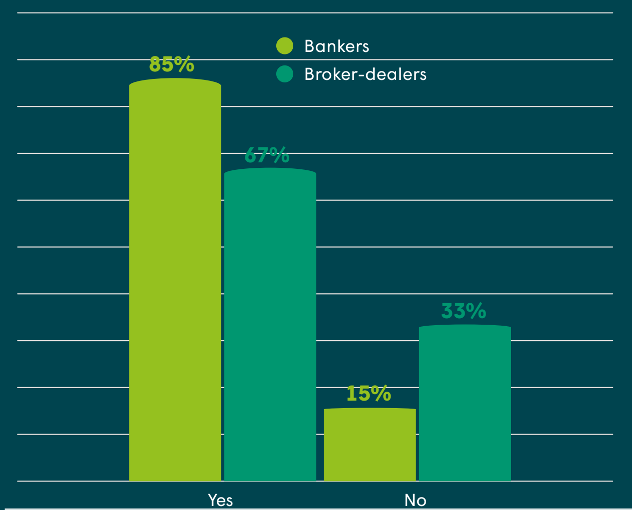



Figure 13: Do you expect algorithms to undertake an increased share of trading and transactional activities in your business?

Correy Voo, managing director of Elicor Consulting, says recent technological innovations such as chat bots and machine learning are making automated response systems "much more sophisticated," and it may become easier to use substitute robot advisors if they ever become indistinguishable from humans.

### Augment people or replace them?

Interestingly, automated technology may not simply replace people. Most respondents expect technology to augment human analysts rather than replace them (see Figure 14).

Technology is likely to augment people by offering access to additional market data and execution algorithms in the front office, assisting with risk management and compliance in the middle office or conducting post-trade processing, corporate actions and reconciliations in the back office (see Figure 15).

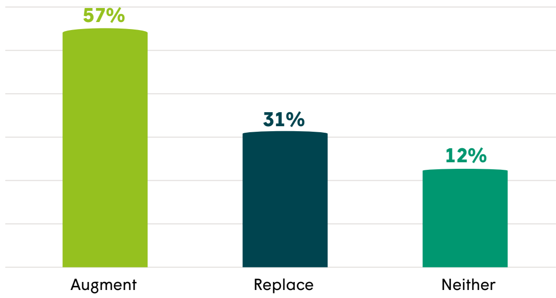



Figure 14: Do you expect technology to replace or augment human analysts?

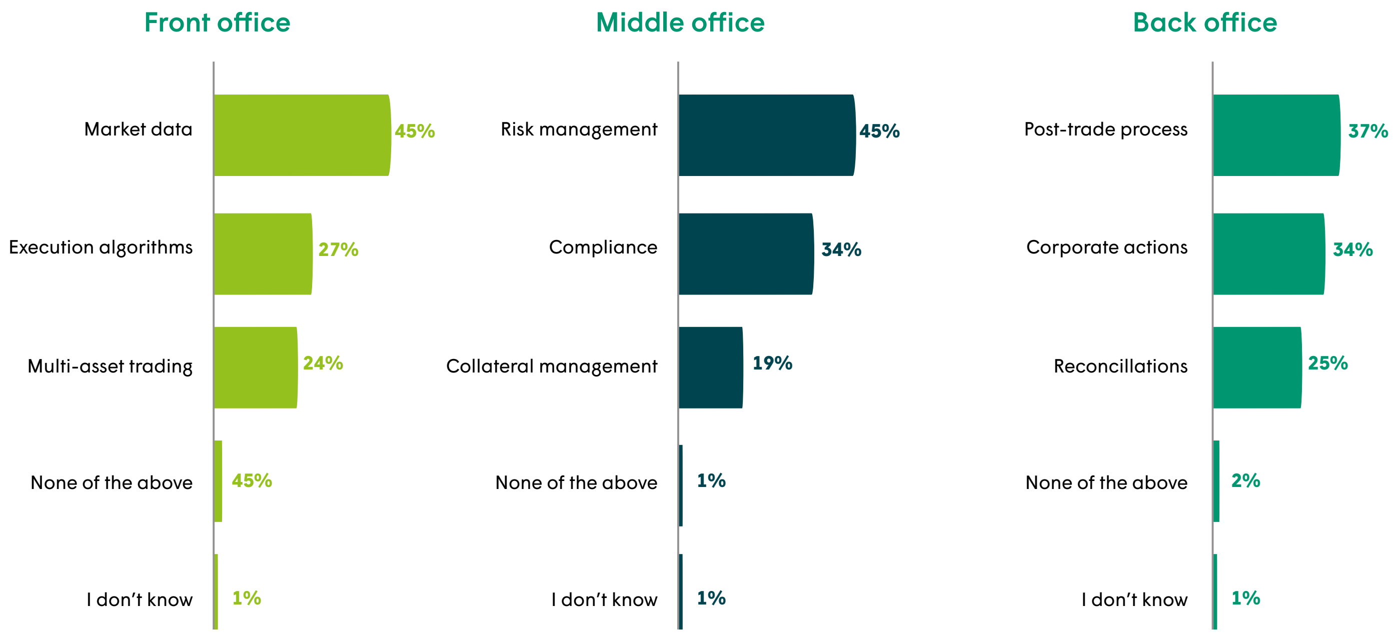



Figure 15: Which areas will technology have the most impact on within your business over the next two years?

FIS' Craig Costigan believes "amazing things can happen" through the application of machine intelligence to sell-side transactions. He says, "It could start with algorithm trading; we're now seeing it in back office with intelligent workflow. We are moving from brute force to intelligence, and it will be transformative to the sell side."

As algorithms become more sophisticated and regularly start to incorporate insights from supercomputing, artificial intelligence or big data, they may start to demonstrate higher returns than humans and displace more of the roles currently filled by humans.

Juerg Blattner of Zürcher Kantonalbank says, "Our approach is to use big data to improve customer experience. We are providing them with a tailor-made service. That's really the key." He adds, "When you better profile your customers, you can offer them better services related to their data."

Where people cannot compete with technology or be augmented by it, they will have to focus on their core strengths to remain employed. These could include social "soft" skills, imaginative thinking, and specialist skills and insights.

**"We are moving from brute force to intelligence, and it will be transformative to the sell side."**
Craig Costigan, division executive, Risk, Compliance and Global Securities , FIS

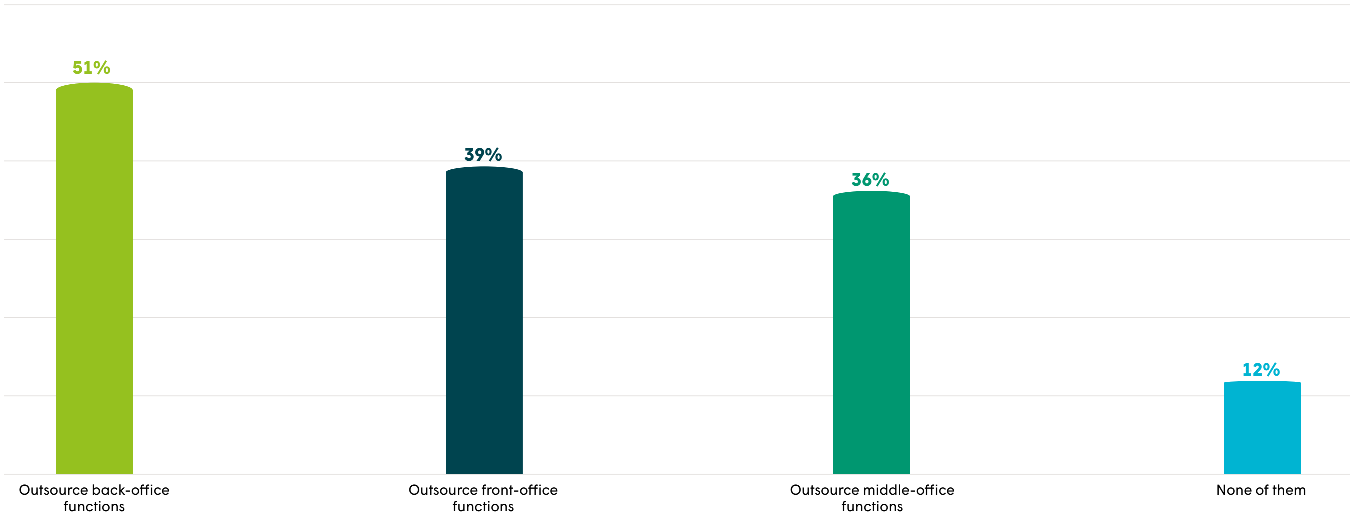



Figure 17: By 2020, my business is likely to:

## A new model built on outsourcing

Outsourcing is recognized as a key trend in the industry. Of those who say outsourcing is an important trend, more than a third (38 percent) identify it as the most important trend over the next five years.

In addition, 51 percent of respondents believe their business is likely to outsource their back office, with 36 percent predicting the outsourcing of their middle office and 39 percent their front office (see Figure 17). Such a shift towards outsourcing would result in profound structural changes throughout the front, middle and back offices of both bankers and broker-dealers.

In particular, the introduction of outsourcing could affect many traditional jobs, their constituent specialist tasks and all areas of business activity, so it is significant that a large percentage of respondents across all offices indicate high levels of openness to outsourcing.

The **back** office appears to be seen as the most expendable, which makes sense given how much it is prescribed and regular work. However, it is also possible that the back office will prove harder to outsource than it seems because of the complexity and importance of its tasks.

For the foreseeable future, a level of in-house expertise is likely to remain important in the back office, although outsourcing may gradually permit back-office staff to shift towards managing technical projects and away from daily administrative tasks, helping firms to meet specific compliance requirements.

The **front** office appears to be the next most vulnerable to outsourcing, and this is slightly surprising given that this is the part of the business most customers see. With almost 40 percent of respondents suggesting that the front office could be outsourced, it seems that more sales and trading activities are likely to move to electronic trading or white label utility services that are provided by trusted third parties. This trend could allow remaining front-office staff to concentrate on generating added value for their most prized customers, while firms can introduce lower cost and highly automated financial technology services for new markets or services.

Although the **middle** office is also considered vulnerable to being outsourced, it is striking that the fewest respondents picked out the middle office as being suitable for outsourcing. This could be because the other offices have regular contact with the middle office and both respect the complexity of its functions and appreciate the support that they receive from in-house staff. It is possible that the middle office will become more important once core front- and back-office roles have been outsourced. In fact, if the sell-side industry starts to heavily automate and outsource any activities that are not core to its value proposition, we anticipate that the middle office will start to play an increasingly important role in defining the firm's core strategy and strengths.

The 12 percent of respondents who expect none of their offices to be outsourced are also of note, as this indicates that priorities beyond cost remain important, perhaps in terms of maintaining confidentiality in relation to clients and secrecy regarding investment or corporate strategies.

**BROKER-DEALERS VERSUS BANKERS: OUTSOURCING**

One interesting difference between broker-dealers and bankers is that 21 percent of broker-dealers do not expect to outsource any of their front, middle and back offices by 2020, versus only 7 percent of bankers.

This suggests that broker-dealers place more importance on the maintenance of close personal relationships within their institution. Broker-dealers have also retained more trust with their customers or have more to keep secret and cannot afford to share the investment strategies and trades with outsiders, even if it saves them some money.

By contrast, bankers seem to perceive outsourcing as more universally acceptable, perhaps as a way to stay lean and competitive in the marketplace, extract the maximum possible benefit from their data at the minimum cost and manage their ballooning compliance burden.

**Connecting the dots**

One of the most startling observations is the number and scale of disconnects between what respondents say are important issues and where they invest money and effort.

For example, 77 percent expect increased regulation to severely impact their business over the next 24 months, and 75 percent of our respondents expect regulations to significantly change their revenue model (see Figures 1 and 2). Yet only 12 percent intend to invest more in regulatory compliance (see Figure 18).

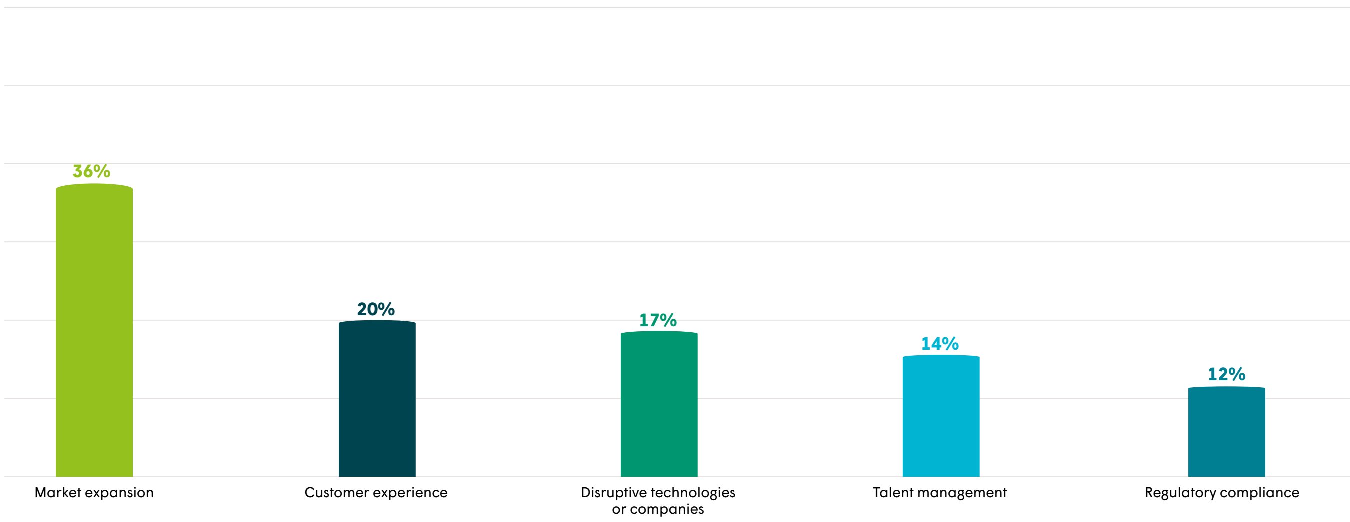



Figure 18: Where will you increase investment the most by 2020?

A similar disconnect exists in relation to the concerns expressed about the impacts to business and revenue models of regulation and the low ratings for risk and compliance when it comes to the effective adoption of technology (see Figure 19).

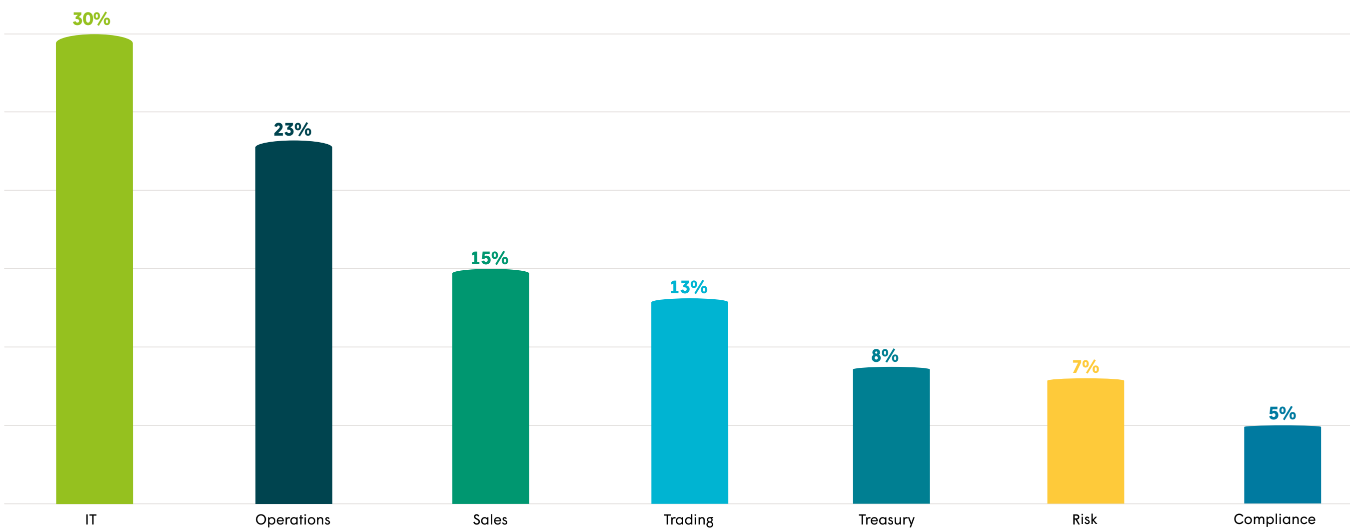



Figure 19: Which area of your business has adopted new technology most effectively?

### First and worst

The best adopters of technologies include IT and operations personnel, who have the strongest relevant skills and responsibility for keeping their business working as it should.

The worst adopters include risk and compliance departments. This indicates that firms face the danger of not adequately preparing for imminent new regulations, despite their responses indicating that they consider regulation a major concern and a threat to revenue.

Meanwhile, the adopters in the middle – including sales and trading – risk missing opportunities to change the tools they rely on and use technology to augment their work to the maximum extent possible.

Nizar Tundai,head of information technology and PMO at Diamond Trust Bank Kenya, says progress can be monitored, however. "We will need to see exactly how new technology, be it blockchain or any of these other technologies, deliver value in a business context. Important indicators will be revenue, market share from onboarding new customers and efficiency."

### Adopt or die

Another disconnect comes around that intersection of technology and business. An impressive 87 percent of our respondents see their company as being a technology-driven business (see Figure 20).

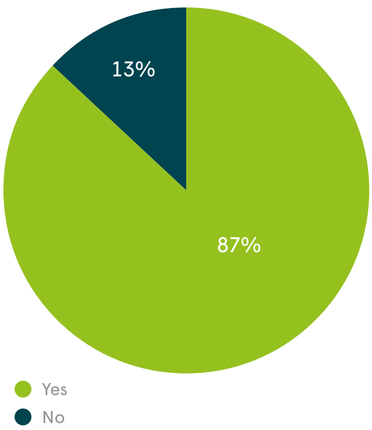



**Figure 20: Do you feel your company is becoming a technology-driven business?**

## 87 percent feel their company is becoming a technology-driven business.

But 9 percent of our respondents come from firms that have not enhanced their technology offering to existing clients for more than five years, and 29 percent haven't done so for two to five years (see Figure 21). This means that almost four out 10 respondents have not enhanced their technology offering within the past two years.

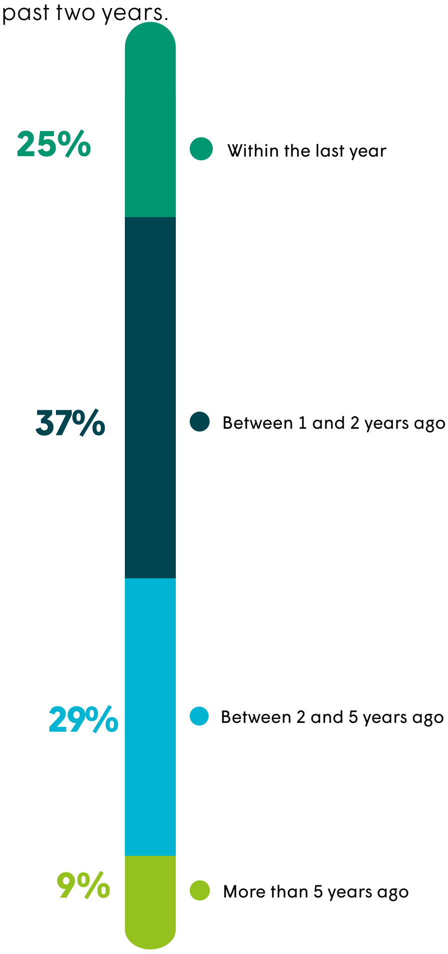



**Figure 21: When did you last enhance your technology offering to existing clients?**

FIS' Costigan says, "They're kicking the cans down the road, and they're putting it off because it never fits into this year's budget. So it ends up being five years since they last upgraded a platform, and then the cost of the upgrade goes up every year."

In addition, in a world where smartphone apps are typically updated at least once a month and companies are under constant attack from hackers, this slow pace of enhancement will become unacceptable and insecure.

These disconnects probably occur for valid reasons. But it would be dangerous to assume that such disconnects between known problems and the introduction of appropriate technology-based solutions can be delayed indefinitely in a competitive market. Well-planned and funded efforts are needed to close these gaps.

### New technology, new ideas

One of the most exciting developments in finance has been the emergence of lean, agile and experimental fintech start-ups that are injecting fresh business ideas and new technologies into the financial community, including the sell-side industry. For example, the development of distributed ledger technology, such as blockchain, is inspiring banks to start rethinking their own infrastructure and how they ensure their data is accurate and tamperproof.

For many years, scale was viewed as the primary means for driving down costs. Now, fintechs are upending this perspective by emphasizing the scope for technology to drive down costs, increase competitiveness, open up markets and address real business needs.

Ian Dowson, founder and principal of William Garrity Associates, says, "What's happening now is that there's a blurring between research data science and the software that investment banks use. What the startups do, usually, is combine people with market domain experience and advanced intellectual capacity to really push the boundaries on mathematical and technological areas. They then offer new products to the capital markets and sell-side industry."

To date, the majority of fintech startups have not had the scale to take on the main sell-side infrastructure. They simply cannot compete with large, complex financial institutions that provide integrated products and services, have access to significant liquidity and capital, and can meet regulatory requirements.

FIS' Costigan says, "The smaller, more nimble companies are providing interesting components. If they can provide a model engine or risk cube or something that could be digested by a sell-side bank or provided as a function of the vendors, then those smaller, more disruptive firms can do great things."

And the alternative to competition may be partnership. Fintech companies could partner with established sell-side firms, giving startups access to investment and sell-side firms the ability to capitalize on fresh thinking and technology. In fact, 17 percent of sell-side firms plan to invest in disruptive technologies or companies by 2020 (see Figure 22).

However, sell-side firms shouldn't underestimate the cultural component of this shift. Dowson highlights three main components to the success of fast-moving tech companies: data science, design and the importance of culture. He says, "Culture is most important of the three, because you can buy the other two eventually, but the culture you can't. It's based on human relationships, and it's that cultural change which boards have to grasp."

If not, he adds, "[The current sell-side world] may wake up one morning and find there is an API investment bank which is eating away at their customer base."

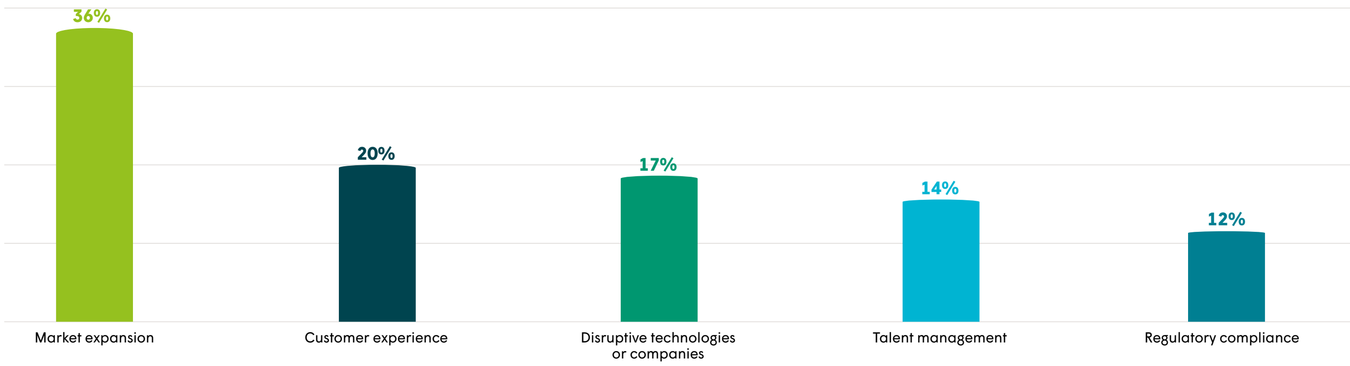



Figure 22: Where will you increase investment the most by 2020?

**17 percent of sell-side firms plan to invest in disruptive technologies or companies by 2020.**

# CONCLUSIONS

## Learning to navigate a world that's upended

The long-running trends of regulation, business change and disruptive technologies have reshaped the sell-side landscape, making it nearly unrecognizable. Both banks and broker-dealers are balancing demanding regulations and economic pressures while being driven by a increasingly competitive market to become more transparent and responsive.

Regulations applying to data privacy, trade transparency, tax, global rules, capital requirements, solvency and reporting are all becoming stricter, and the penalties being imposed by regulators are growing larger. The regular headlines about data breaches highlight the impact of hacking, poor controls on customer relationships and reputation at a time when competition is fierce.

Blind trust is in scarce supply, and sell-side firms must demonstrate that they offer clear value for money and disclose the risks associated with their trading processes. Even if firms have postponed investing in improving their compliance procedures, they are likely to find it much harder to defer investments in the more detailed and immediate reporting called for by their clients.

In addition, more and more decisions currently undertaken by humans are likely to be delegated to algorithms. To date, algorithms have exceeded the capacity of humans to identify complex patterns hidden within big data and the speed of the human nervous system when reacting to trading opportunities. It is likely that the forms of activity and decision they can undertake will continue to expand as computing power becomes faster, cheaper and smarter.

Artificial intelligence is already being incorporated into algorithms, and when the so-called singularity is reached and computers can exceed human intelligence in many different ways, the role of humans in finance could really come under pressure.

Fortunately, people are likely to remain better at decoding the human psychology of markets and relationships for a considerable amount of time, but it cannot be assumed that we will maintain our natural advantage forever.

## Business models and culture shock

For now, the demand for human oversight and judgement remains high. In fact, a new suite of human skills could become ever more important within the sell-side industry as it moves away from the traditional banking and brokerage models, towards more tech-driven business models that require different types of human oversight and judgement.

Traditional sell-side firms have the advantage of a track record, access to capital and clients, but they lack many of the latest skills that set the pace in terms of innovation. Whether sell-side firms can utilize fintech and make the cultural shift from financial services firm to technology-driven business is another question.

The latest breed of startups benefits from having low setup costs, cutting-edge skills and reduced visibility to regulators. As they tap into the latest automation and outsourcing services via managed services or utility platforms, they might start to challenge the business models of traditional firms that are held back by legacy technology systems, staff or working practices.

Certainly a state of denial appears to exist, as the sell side has not faced up to the scale of the regulatory burden and the extent to which competitive startups or tech-savvy incumbents can automate and outsource traditional functions within a few years.

Sell-side firms must act boldly to close internal disconnects. If they wish to successfully compete amid all of these pressures, they must identify the optimal strategy for their business, possess modern (horizontal) leadership skills and up-to-date technical skills, and invest in new, potentially disruptive technologies and sought-after staff.

Sell-side firms must act boldly to close internal disconnects.

# Bonus: Tech trends by function

## The front office: Tech trends

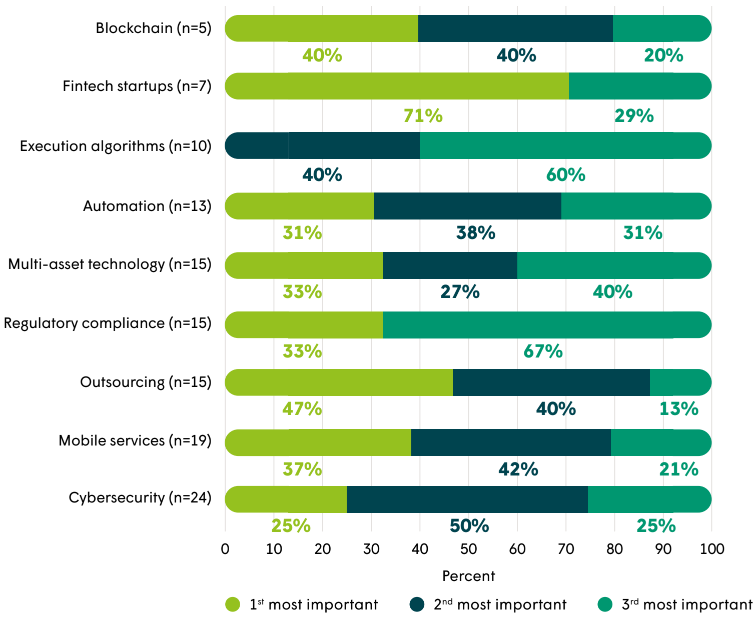



Figure 23: Broker-dealers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

When asked to identify a single tech trend that was of particular interest, front-office executives from both broker-dealers and bankers highlight fintech startups, with bankers giving almost equal priority to automation (see Figures 23 and 24). This common interest across both front offices suggests that they see new business ideas that are of relevance to them, and which could be disruptive, even if they have not reached scale yet.

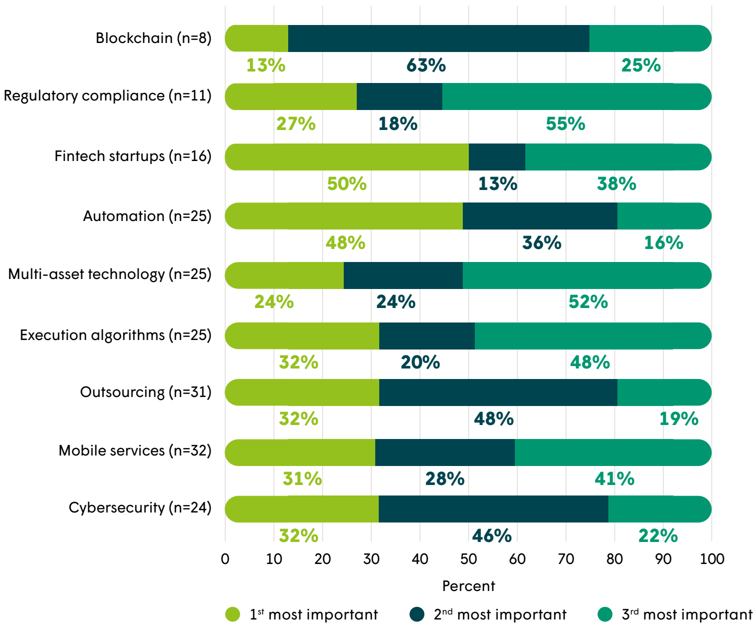



Figure 24: Bankers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

Although never a standout priority, the front office of broker-dealers is the most interested of any subgroup of respondents in the emerging trend of multi-asset technologies, which make it possible to trade all assets from one place. This might indicate their ability to leverage their relationships into different asset classes once the technology exists to permit this extension of their activities without great expense, complexity or risk.

## The middle office: Tech trends

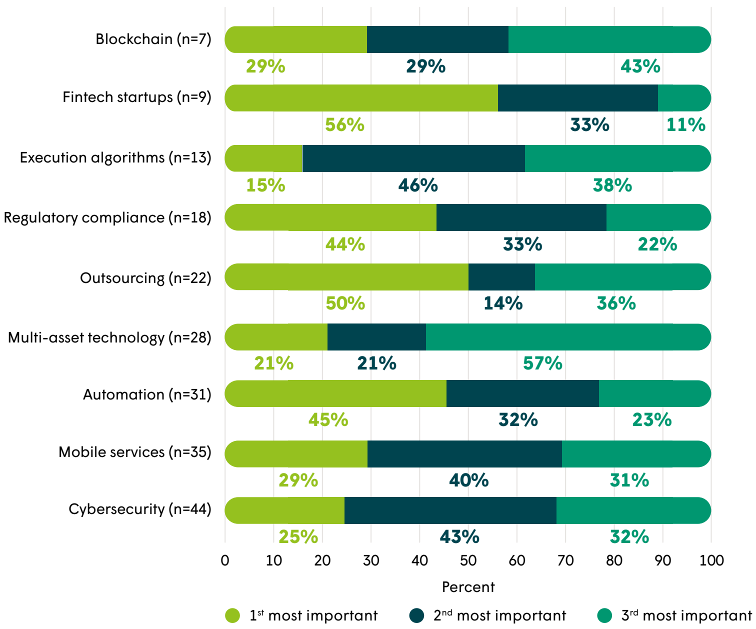



Figure 25: Broker-dealers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

The middle offices of broker-dealers choose fintech startups to a lesser extent than the front office but show similar interest in outsourcing and regulatory compliance (see Figure 25). This spread of interests perhaps reflects the wide range of functions performed by the middle office of a broker-dealer and the many areas that could be assisted by new technology.

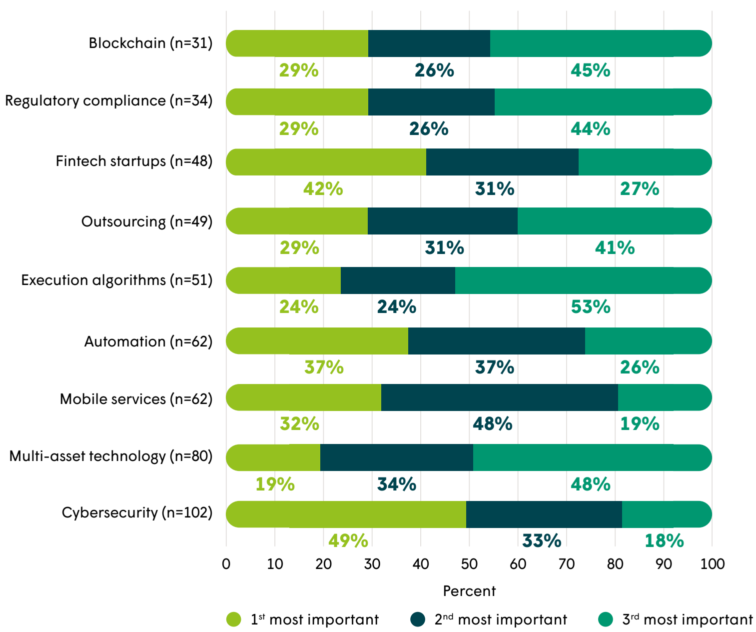



Figure 26: Bankers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

Although fintech is of interest to the middle office of bankers, cybersecurity is their most important tech trend of the next five years, perhaps reflecting the pressing need for banks to keep their investment strategies secret and protect their legacy systems from hacking (see Figure 26).

## The back office: Tech trends

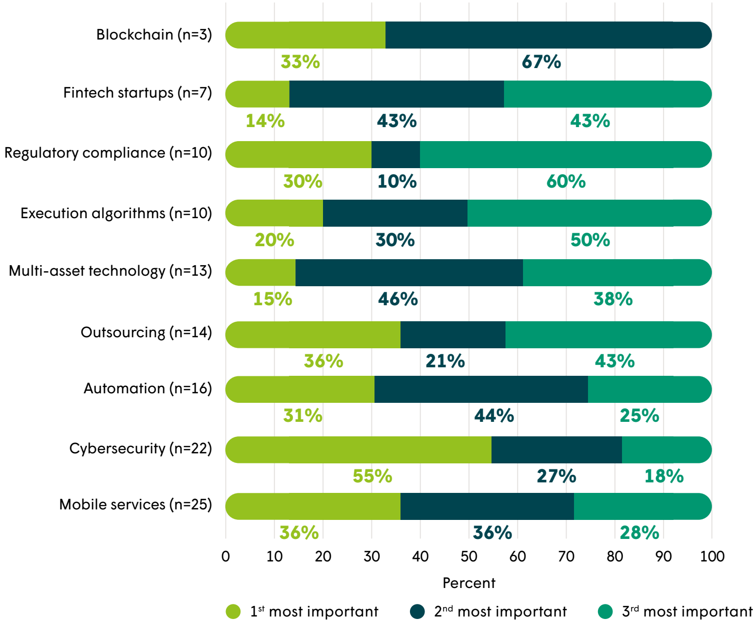



Figure 27: Broker-dealers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

Cybersecurity is the most important tech trend for the back office of broker-dealers. This indicates a concern about others having access to summary information about their trading strategies (see Figure 27).

Mobile services, blockchain and regulatory compliance are secondary areas of interest, perhaps because the working day is extending and assurance is moving away from paperwork towards digital documents that can be automatically used to comply with regulations at high levels of confidence.

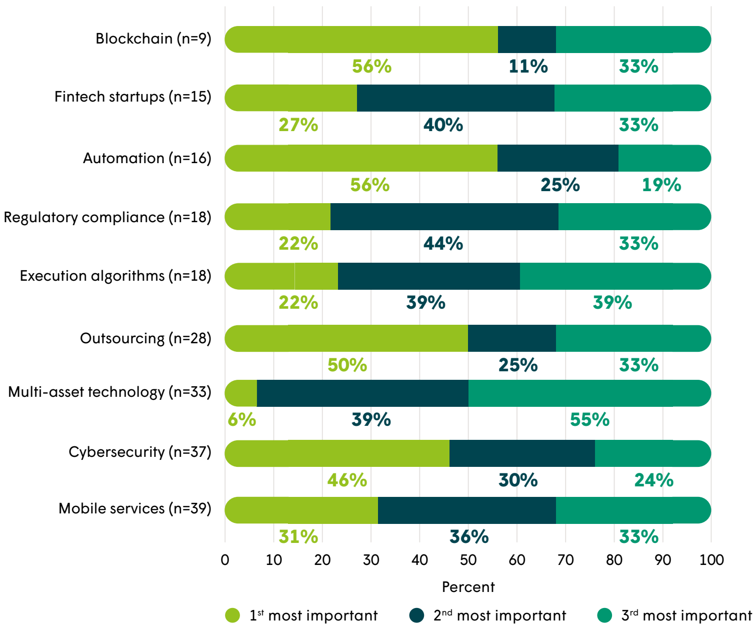



Figure 28: Bankers: Which of the following trends do you think will be most important to your sell-side business over the next five years?

Automation, outsourcing and blockchain are stronger trends than cybersecurity in the back offices of bankers (see Figure 28). This may indicate that the automation and outsourcing of back-office functions is already happening or closer to happening in banking. Cybersecurity remains important to the back office of bankers, but perhaps it is already good in the banking world and there is less room for improvement than is the case with broker-dealers.

# Appendix: Survey details

## Methodology

This study has been conducted by Lantern Insights, an independent U.K.-based thought leadership research company.

Predefined professional demographics and industry geographies were set prior to conducting the survey. Technologies with the potential to impact the sell-side industry were assessed and developed into a 20-question survey. The questions were designed to draw out respondents' opinions on industry trends, impacts and opportunities.

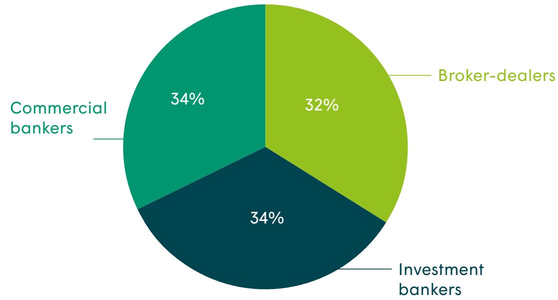
An online and telephone questionnaire was completed by a total of 464 respondents.

The full survey responses have been tabulated and charted by question and the data further sifted to identify trends across the overall sample. The data has also been parsed for variations between bankers and broker-dealers and for differences between specific regions and the rest of the world.

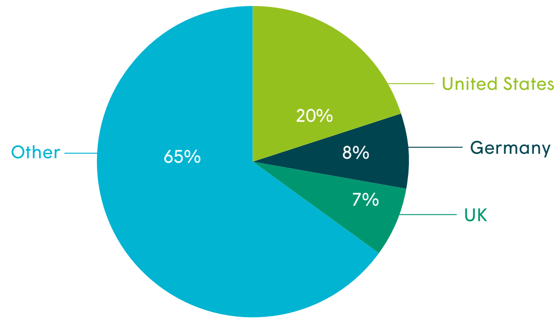
The survey was supplemented by qualitative interviews. Small extracts from these interviews are quoted in the report.

## About the survey sample

The sample of 464 industry experts consisted of three functional cohorts.




By geography, the highest share of respondents, 20 percent, was concentrated in the United States, followed by Germany (8 percent) and the United Kingdom (7 percent). The remainder were from a range of countries/jurisdictions: Canada, Mexico, Brazil, Chile, Colombia, Peru, France, Austria, Switzerland, Spain, the Netherlands, Belgium, Luxembourg, Europe (other), Turkey, the UAE, Qatar, Saudi Arabia, Egypt, Kenya, Nigeria, South Africa, Hong Kong SAR, Japan, Singapore, Malaysia, Philippines, Indonesia, APAC (other), Australia and New Zealand.




Respondents' employers ranged in size. By assets under management (AUM), firms with up to $99.99M in AUM were the largest subgroup, accounting for 15 percent of the total. The next largest subgroups were organizations with $500M to $999.99M in AUM (14 percent of respondents) and those with $5Bn to $9.99Bn in AUM (14 percent). People working for firms with $100Bn to $249.99Bn in AUM and those working for organizations with $250Bn or more in AUM each comprised only 5 percent of the sample. The most common job title was head of finance (19 percent), followed by head of IT (13 percent) and head of sales (11 percent).

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