

Top Ten Trends in Capital Markets 2017

What You Need to Know



People matter, results count.

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Introduction

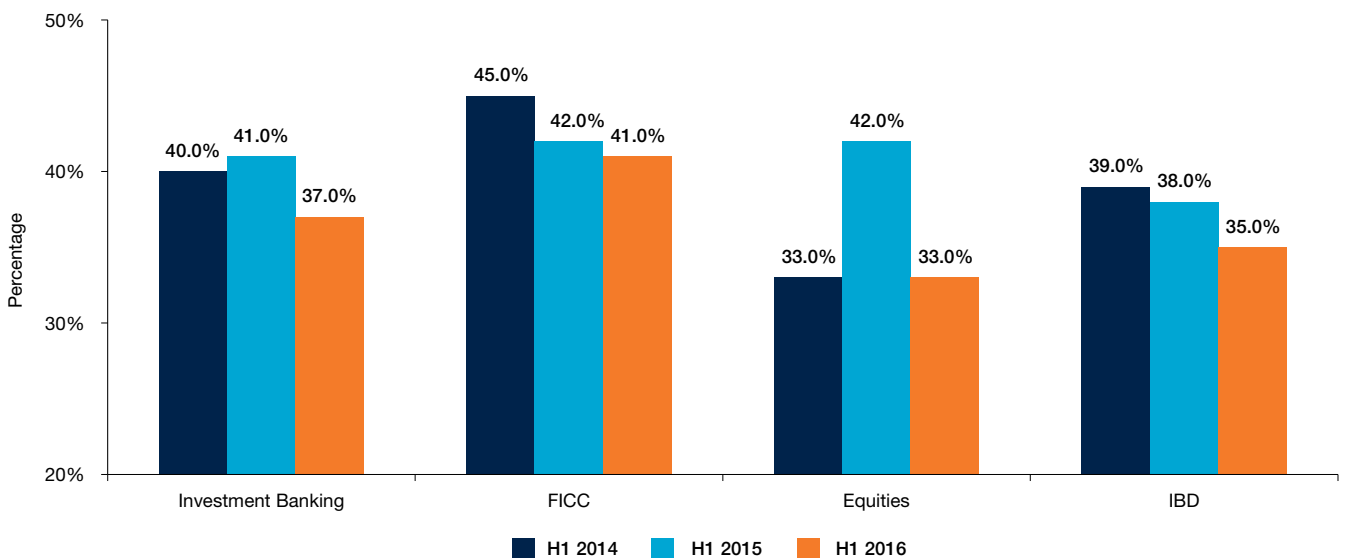


Global capital markets witnessed slow growth in 2015 and early 2016, with decline in equity market capitalization as well as debt market volumes. Investment banks are facing decline in fee income due to slowdown in M&A activities as well as new issuances in primary markets. As revenues and operating margins of investment banking firms continue declining, (See Exhibits 1 and 2) they are focusing on simplifying and redefining their business models to move toward a more profitable and sustainable future.

The major trends in the capital markets industry revolve around the impact of evolving regulations and the ramifications of new emerging technologies, such as blockchain and robotic process automation (RPA) on market participants.

Evolving regulations since the 2008 financial crisis continue to have major structural and technological impact on the capital markets industry. The investment research function is being disrupted as regulations result in unbundling of pricing models, forcing investment research divisions to align their business strategies with the new regulatory environment. Globally, regulations are increasing the demand for collateral management and market participants are looking for centralized and integrated collateral management offerings. With regulatory compliance becoming one of the biggest challenges for incumbent capital markets firms, they are collaborating with FinTechs¹ targeting specific parts of regulations.

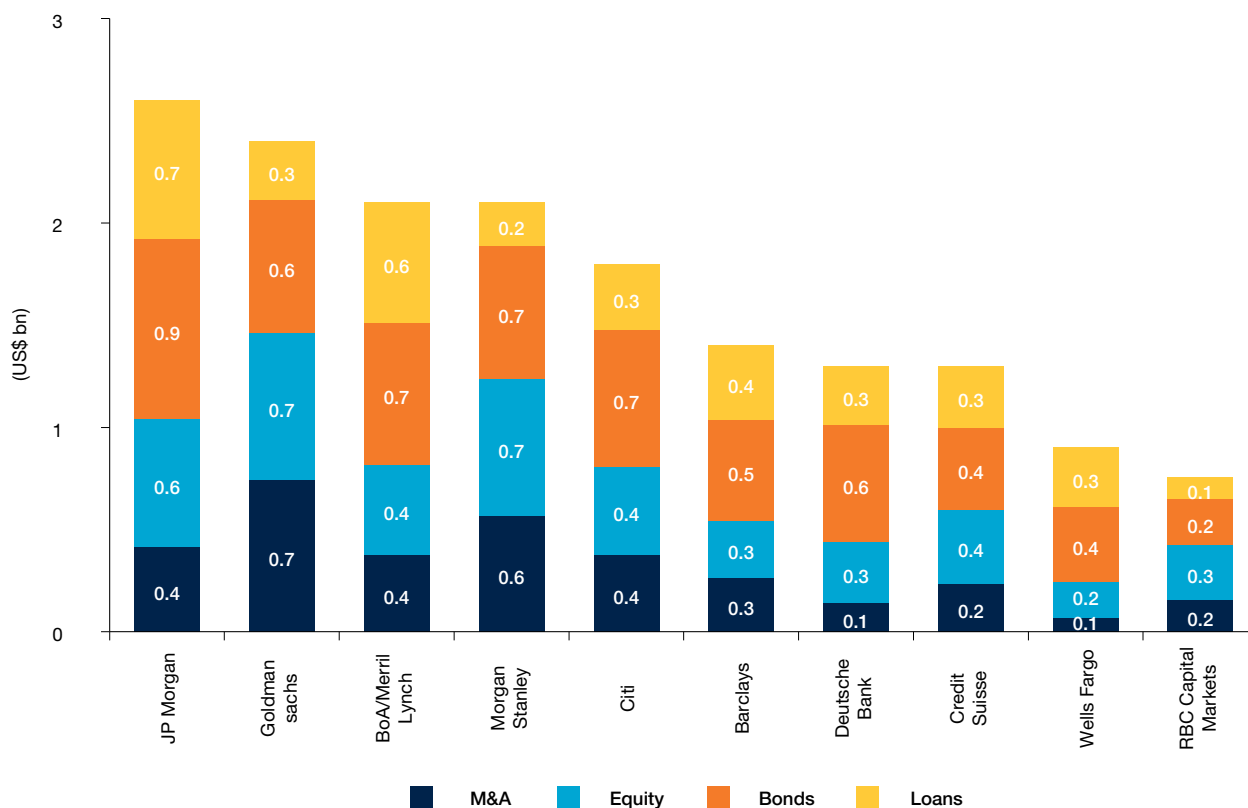
Exhibit 1: Operating Margin of Top 12 Investment Banks, by Business Line, H1 2014–H1 2016



Source: Capgemini Financial Services Analysis, 2016 ; Coalition IB Index ,1H16

¹ FinTechs are the new financial services firms that are less than five years old and have a relatively small but growing customer base

Exhibit 2: Fees Collected by Top 10 Global Investment Banks (US\$ Billion), H1 2016



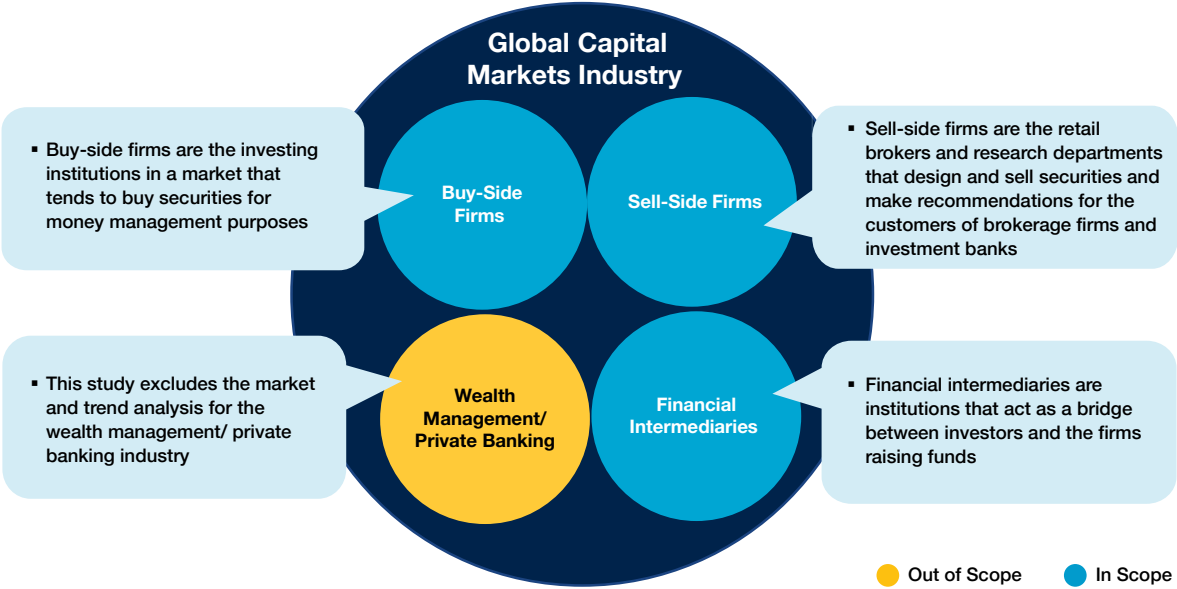
Source: Capgemini Financial Services Analysis, 2016 ; Global Investment Banking Review, Thomson Reuters, July 2016

FinTechs are also capitalizing on the rapidly changing technology landscape and customer expectations to shape the future dynamics of the industry. Numerous applications of blockchain technology are becoming mainstream in capital markets. RPA, which has resonance especially in sell-side and financial intermediaries, is helping firms reduce their operating costs and gain competitive advantage. With technological advancements and the alleviation of fears around security, cloud-based solutions are gaining more acceptance in capital markets. Firms are leveraging data management and analytics for catering to regulatory requirements along with driving client experience, which is a critical and essential element for firms to achieve sustainable business growth. Cybersecurity continues to be a focus area for firms as digitization of various parts of the value chain is increasing risk exposure.

This paper aims to understand and analyze the top 10 trends in the capital markets industry with a focus on the following market players (see Exhibit 3):

- **Buy-Side Firms:** Mutual funds, hedge funds, pension funds, unit trusts, proprietary trading firms, and private equity
- **Sell-Side Firms:** Investment banks, brokerage houses, and independent analysts
- **Financial Intermediaries:** Stock exchanges, clearing houses, and custodian banks

Exhibit 3: Scope of the Paper



Source: Capgemini Financial Services Analysis, 2016



Trend 01: Focus on Simplification and Redefining Business Model

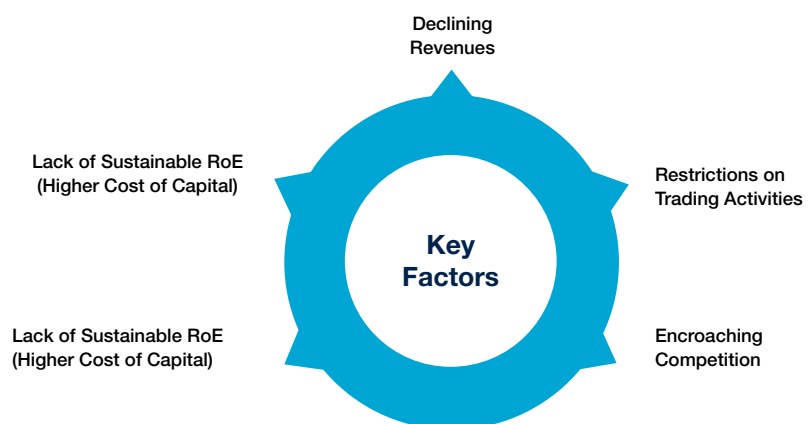
Investment banks are focusing on simplification and redefining their business models.

Background



- Investment banking, as an industry, has been under pressure due to stricter regulatory supervision, tighter liquidity and capital requirements, increased costs of compliance, and newer forms of competition (see Exhibit 4).
- Returns on equity (RoE) have dropped to levels that are barely above cost of capital; in some cases below the cost of capital:
 - Globally, top investment banks saw RoE of just 6.7% in 2015, down from 9.2% in 2014—this was below their cost of capital which was at least 10%.²
- Investment banks are reducing their trading/speculative activities as regulatory restrictions have made this line of business less profitable.
- With declining revenues, banks are trying to protect their bottomline with enterprise-wide cost-saving initiatives.

Exhibit 4: Factors Impacting Investment Banks



Source: Capgemini Financial Services Analysis, 2016

² "Investment banks' return on equity declines", Laura Noonan, *Financial Times*, February 2016, accessed October 2016 at <https://www.ft.com/content/0c65e85a-d719-11e5-8887-98e7feb46f27>

Key Drivers



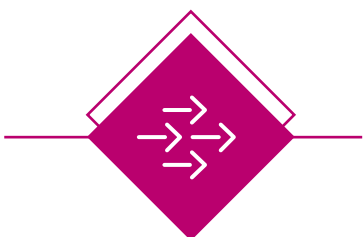
- A strict regulatory environment over the years after the 2008 financial crisis has compelled investment banks to institutionalize transparent and accountable business processes; thus, the banks have been incurring higher costs over the past few years, rendering many business lines unprofitable.
- Total revenue across the top ten banks globally in the first six months of 2016 fell 15% from the same period a year ago:³
 - Revenues dropped sharply across all business lines—fixed income, currencies and commodities (FICC) (11%), equities (18%), and traditional investment banking (20%).
- The shift of many products to exchange trading has been squeezing margins for the banks' trading businesses, while their preferred complex, high-margin instruments are falling out of favor with investors.
- The industry as a whole needs to transform technologically in order to be competitive as new entrants into the industry encroach their areas of business.



Trend Overview

- Steadily declining revenues and consistently low returns on equity mean that a structural transformation of the industry is essential to ensure growth and sustainability in the future.
- Ongoing initiatives by many investment banks across the industry have started showing results and it is imperative that others implement them as well in order to stay compliant and competitive:
 - Banks must work at rebalancing their presence across portfolios and exit non-core business functions and focus should be on less capital-intensive primary markets where they can leverage their expertise in advising and underwriting.
 - They should phase out the various complex legal structures and transaction booking models in order to simplify their operations.
 - Long-term strategic initiatives need to be implemented in order to control cost-to-income ratios in an environment where cost of compliance would remain high.
 - Legacy technology systems need to be replaced with state-of-the-art information systems that can be strategic differentiators.
 - They must embed such measures into sales and client service units to enforce a cultural shift that centers on profitability at the client level.

Implications



- Industry is shifting away from capital-intensive fixed-income trading toward advisory and underwriting functions that also provide higher margins, thus propping up the cost-income ratios to sustainable levels.
- Investment banks will need to decide on strategic transformation initiatives that will ensure sustainable revenues with acceptable RoE levels, enabled by better efficiency and productivity.
- Technology investments will gain pace as these firms initiate agile technology platforms in order to facilitate the shifting regulatory and competitive demands.
- Firms will increasingly outsource non-core activities, particularly in mid-/back-office and IT functions.

³ "Broken Deals Are Cutting Deep Into Investment Banks' Fees", Reuters, *Fortune*, July 5, 2016, accessed October 2016 at <http://fortune.com/2016/07/05/broken-deals-are-cutting-deep-into-investment-banks-fees/>

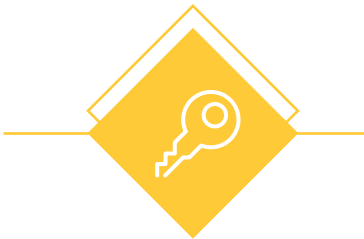
Trend 02: Client Experience To Become Core of Future Operating Model

Driving client experience is becoming a critical and essential element for firms to sustain and grow their business.



Background

- Digital disruption is well and truly underway with clients increasingly expecting a seamless, personalized, one-stop solution across different channels.
- Influenced by BigTech firms, such as Google, Facebook, Amazon, etc., capital markets clients are demanding increased transparency in fees, enhanced self-service capabilities, timely follow-up, and greater access to timely market information.



Key Drivers

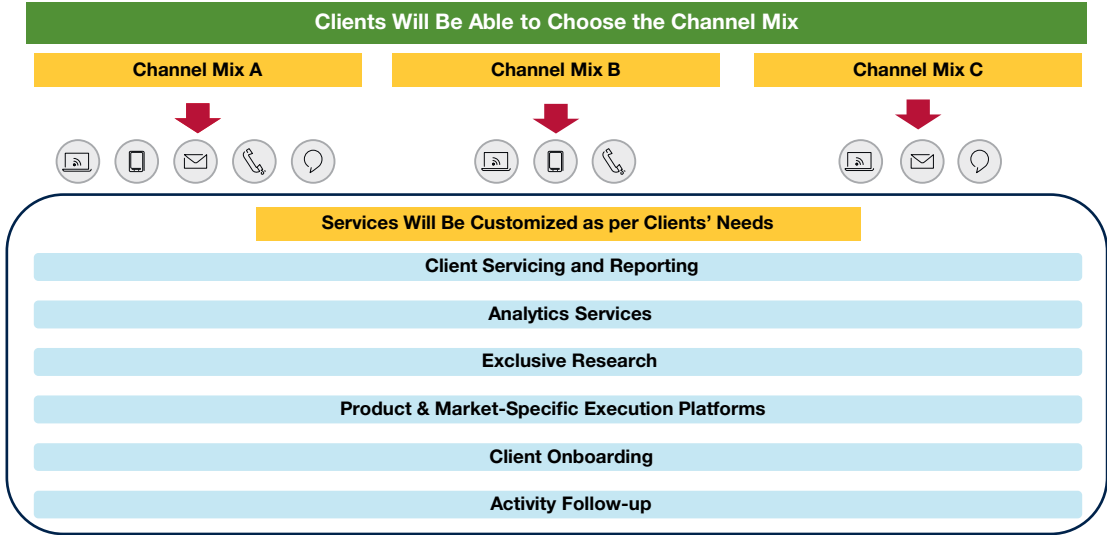
- Increase in tech literacy is one of the prime reasons behind increased client expectations for a personalized, user-friendly, seamless, and integrated experience.
- Possible erosion of market share of the incumbents due to outside competition seeking to disrupt high-value aspects of the industry.



Trend Overview

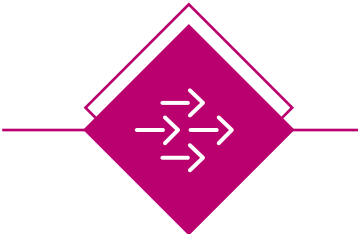
- Clients want to be able to pick and choose their channels, products, and services based on their individual needs for services (see Exhibit 5).
- This presents itself as an opportunity for capital markets firms to offer tailored and unique client experiences leading to increased engagement and differentiation.
- A client-first approach will result in lowering of client switching cost and unbundling of products and services as client stickiness and consequently profits become intertwined with client experience.
- The transition to a client-focused approach is going to require a cultural shift starting from the board level.
- Constrained by budgetary restrictions, companies are finding it hard to balance between the need to transform themselves to stay relevant in the future and their current business and regulatory requirements.
- Big Data analytics-driven insights will form the cornerstone of client experience and business growth.

Exhibit 5: Drivers of Client Experience



Source: Capgemini Financial Services Analysis, 2016

Implications



- The future of products and services is expected to shift to a client-centric approach from the current product-centric approach.
- The current single-dealer model will evolve into a service-based model, coexisting with multi-dealer platforms with the ability to provide differentiated client experience based on their behavior and needs.
- Savvy banks will develop strategies for the long term and use this disruption as an opportunity to provide differentiated products and services.

Trend 03: Increasing Focus on Collateral Management by Market Participants

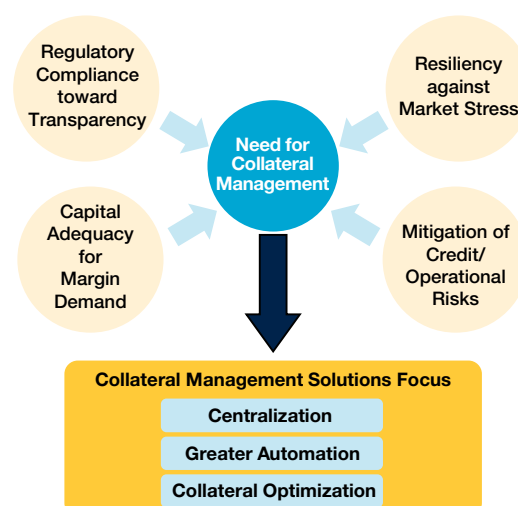
Collateral management is witnessing increased focus from market participants as they demand end-to-end integrated solutions for effective collateral optimization.

Background

- The importance of collateral management has increased significantly post-2008 financial crisis due to stringent regulatory requirements leading to market restructuring:
 - The shift of over-the-counter (OTC) derivatives into a central clearing counterparty (CCP) means that firms must now pledge collateral on a daily basis rather than weekly or monthly, as was the case before.
 - With limited eligible collateral in the system, changes to collateral supply and demand dynamics due to new regulations have affected most financial services organizations.
- Moreover, siloed and decentralized legacy collateral management processes have also made it difficult for firms to deal with data management and reconciliation.
- Many firms (both financial intermediaries and asset owners) are navigating the ongoing market restructuring to understand the full implications and potential opportunities of the post-crisis regulatory landscape in collateral management (see Exhibit 6).
- The industry now wants standardized messaging and connectivity with market participants such as CCPs and CSDs across the world in order to improve collateral mobility.
- Though the collateral management function is a priority for many firms, lack of automation and decentralized legacy structure of operations have hindered substantial progress.



Exhibit 6: Need for Collateral Management Solutions



Source: Capgemini Financial Services Analysis, 2016



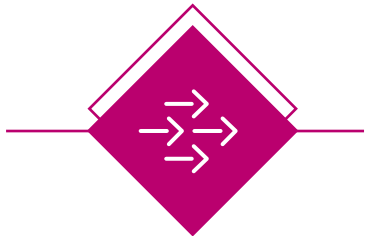
Drivers

- Globally, regulations are increasing the demand for collateral, and changing its supply dynamics, thus warranting efficient collateral management among various market participants.
- Increased regulatory mandates on trade clearing along with tighter capital requirements and bilateral margin rules have increased the pace of transforming collateral management practices in the capital markets industry.



Trend Overview

- Regulatory mandates are transforming collateral, clearing, and liquidity management—they are converging together, thus requiring globally integrated models and technology.
- Sell-side firms are working to reengineer trade processes, increase operational efficiency, and develop integrated views of all counterparties.
- Custody banks have started offering custody and liquidity services covering the full trade lifecycle to both buy-side and sell-side participants.
- The optimum collateral solution will take into account a firm's trading profile, risk management, collateral utilization needs, and balance sheet usage.
- Market participants are focusing toward a balance between minimizing balance sheet usage, funding costs, and use of collateral through effective collateral management.



Implications

- Collateral, clearing, and liquidity are converging, requiring globally integrated models and technology.
- Custody and settlement functions are increasingly transforming into utility models, due to competitive pricing, customer demands, and evolving regulatory standards.
- Among the array of market participants, there are some institutions such as collateral hubs that are now systemically important as nodes, which handle a large portion of the collateral flow across multiple venues and will be significant players in determining the direction of collateral management in the years to come.
- Clearing members face an immediate increase in clearing costs due to enhanced capital and collateral requirements.
- Operational difficulties are also increasing, such as in areas of near-real-time trade acceptance and collateral segregation.

Trend 04: Unbundling of Pricing Models for Investment Research

Pricing models for research are being unbundled to comply with comprehensive transparency requirements and client demand.

Background



- Over the past decades, it was the sell-side that paid for research, which meant that the sell-side had conflicts of interest, in that they could disguise their own sales pitches as research material to convince investors.
- Gradually, even the buy-side also started providing research services to clients.
- However, the problem in the industry was that the fees used to pay for this research were not transparent, as it was paid out of brokerage fees that the client paid for investment services.
- Regulators, especially in Europe through MiFID II, have now focused on de-linking research payouts from investors' commission payments.

Key Drivers



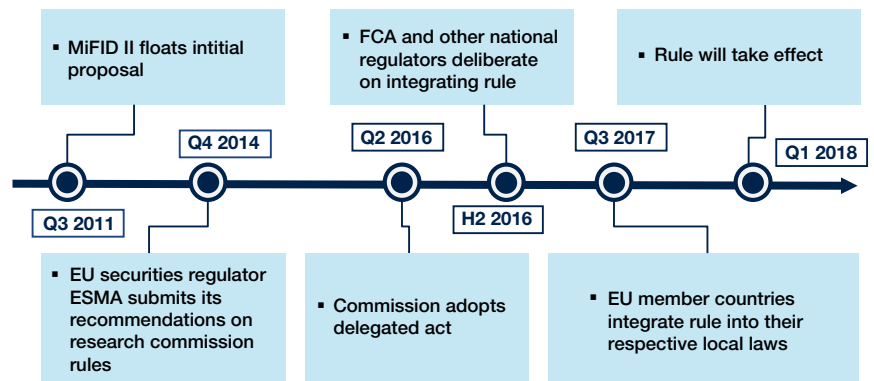
- Regulations currently being enforced require fund managers to create separate, transparent Research Payment Accounts (RPAs) for research-related payments and account those as a cost to the business:
 - In Europe, MiFID II will require the creation of such RPAs to unbundle research payments, requiring pre-disclosed budgets toward research spending.
 - Most global payers in other regions would voluntarily move toward such practices in order to comply with best practices in anticipation of similar mandates by other regulators.
- Investors around the world are increasingly looking for transparency in pricing of investment products, which is forcing asset managers to de-link research payments from other management fees that clients pay to them.

Trend Overview



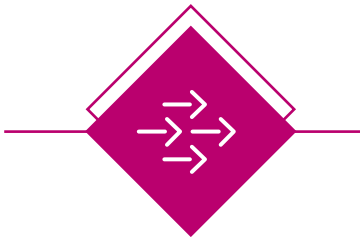
- Regulatory supervision on trading commissions to pay for research services might render the investment research function financially unviable, unless alternative and sustainable pricing models emerge.
- The key aspects of the unbundled mechanism that are essential for firms to incorporate in order to transform the research function are:
 - Asset managers that opt to pay for research via a dedicated client account would need to put in place a transparent budgeting and reporting mechanism.
 - In Europe, under MiFID II, payment for research would have to be made directly from fees collected from clients or from a regulated client RPA (see Exhibit 7).
 - Some firms want to put in place closed-ended subscription models, while others would like a modified panel-vote model to link research payments on the basis of quality assessment.
 - The industry will have to fix a price for specific research coverage and that coverage definition has to be clearly defined to remove.
 - Value-add by the research provider will then determine price revision for such services in the future.

Exhibit 7: MiFID II Implementation Timeline on Investment Research



Source: Capgemini Financial Services Analysis, 2016

Implications



- The effects of transformation of the research function could cost broker-dealers and other research providers €1.7 billion a year in commissions in Europe.⁴
- With payments being unbundled and in-house research houses becoming commercially unviable, the competitive research landscape will expand significantly.
- Asset managers would be able to source from a larger network of research providers, as the array of research content will expand more.
- Price discovery will obviously benefit the high-quality producers of research, but would commoditize those that compromise on quality, eventually driving them out of business.
- Firms may want to specialize their research only via credible sector analyst teams that would make financial sense and generate value through strong investment recommendations.

⁴ "New regs weaken research trading link", Bloomberg Trading Solutions, August 15, 2016", accessed October 2016 at <https://www.bloomberg.com/trading-solutions/blog/new-regs-weaken-research-trading-link/>

Trend 05: Evolution of Data Management and Analytics into a Strategic Function

Data management and analytics is evolving into a strategic function and becoming an increasingly critical element for capital markets firms.

Background



- Analyzing vast amounts of data from different sources across market participants is integral to success for any capital markets player.
- As the industry becomes extremely fast paced, new investment ideas and trends can only be discovered using integrated analytics tools that are capable of organizing information and recognizing patterns within them.
- However, the increasing number of data vendors and minimal differentiation in offerings for external data management and analytics only aggravates the challenge for firms.

Key Drivers



- Business needs are pushing the industry to increasingly consume vast amounts of data that, in turn, drives firms to invest in data management and analytics.
- Increased efficiencies of business processes and reduction of costs also drive the firms to invest in data management (see Exhibit 8).

Exhibit 8: Drivers of Data Management and Analytics



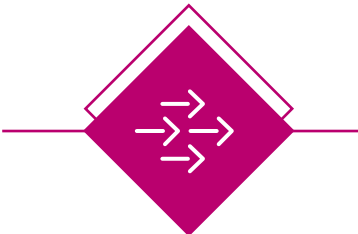
Source: Capgemini Financial Services Analysis, 2016

Trend Overview



- The capital markets industry is one of the top data-driven industries with growing investments in Big Data analytics.
- In order to address changing business requirements, capital markets firms need to consume huge amounts of data from a wide array of market sources.
- Capital markets firms using common data across huge numbers of systems mandates the need for data quality and data governance:
 - Master data management reduces integration costs for firms, establishes single source of truth, ensures unified standards of data across the organization, and improves data transparency.
- Various firms also use business intelligence tools such as Tableau and Alteryx to identify trends in data in a fraction of the time required by spreadsheets, to gain deeper operational insights from data, and for better data reporting and decision making.
- Analysis for trading strategies (scanner algorithms), high-frequency trading information analysis, pre-trade analytics, and sentiment analytics are a few of the areas that are witnessing the most activity from market participants in terms of investments in technology.
- Firms are also exposed to recurring audits and face a risk of incurring huge fines for not complying with their data vendor and exchange contracts:
 - Capital markets firms are under pressure to manage, analyze, and process vast amounts of data.

Implications



- Over the years, there has been a significant increase in unstructured data in the overall data volume:
 - Firms will use predictive analytics to gain real-time and deeper insights into market trends, which will help them in activities such as trading sentiment analysis, investment decisions, etc.
- Asset managers will invest in analytics solutions that offer multi-asset capabilities and can better integrate risk and performance analytics.
- One of the challenges for capital markets players is management of a variety of data sources that use multiple technologies across business lines.
- Overcoming legacy infrastructure issues due to incompatibility in data format and system integration will be an area of focus for firms.

Trend 06: Growing Adoption of Robotic Process Automation (RPA)

Capital markets firms are increasingly adopting RPA, not only to reduce cost but also as a means of competitive advantage.

Background



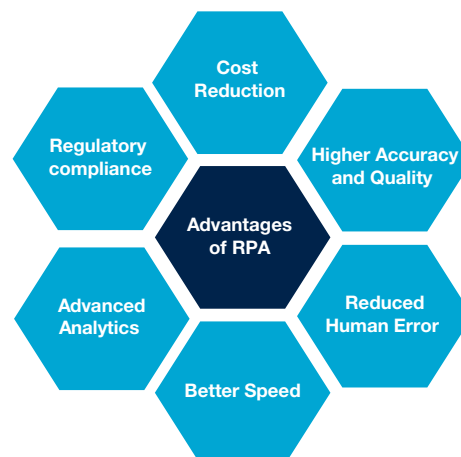
- In order to sustain and grow in today's complex global financial markets, firms require very high levels of speed, precision, and cost efficiency beyond the ability of human workforce.
- With shrinking gaps in labor costs across countries and decline in outsourcing returns, firms are looking for alternatives to cut costs.
- Capital markets firms are increasingly adopting RPA to transform their businesses to improve profitability in the short term, better position their companies for growth in the long term, and enhance their client experience.

Key Drivers



- Globalization of commercial markets, increased scrutiny by market regulators, rising costs, and increasing competition require capital markets firms to hunt for new means to augment revenue, slash costs, and accelerate profits (see Exhibit 9).
- The need to drive efficiency in operations and reduction in costs well beyond the ability of humans.
- Increased productivity is also one of the most important driving factors behind RPA, as it enables staff to focus on high-value, client-focused activities.

Exhibit 9: Advantages of RPA for Capital Markets Firms



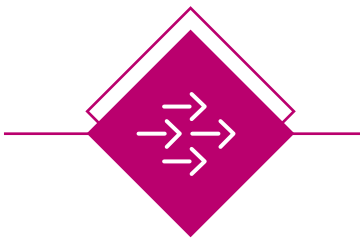
Source: Capgemini Financial Services Analysis, 2016

Trend Overview



- In order to address the rising challenges related to costs, regulations, and data volumes, it is now becoming imperative for capital markets firms to invest increasingly in RPA:
 - The firms are under pressure to find methods to lower costs with the aim of improving profitability.
 - The firms deal with mounting volumes of data and transactions structured around legacy systems that are difficult to integrate.
- The global IT RPA market is expected to grow at a CAGR of 60.5% during 2014 to 2020 to reach US\$5.0 billion by 2020.⁵
- The BFSI sector is expected to be the fastest adopter of RPA:
 - With an estimated market size of US\$13.1 million in 2014, the sector is projected to witness a strong growth in the market, growing at a CAGR of over 65% from 2016 to 2024.⁶
- RPA is enabling firms to reorganize resources to focus on client-facing and strategic roles, and many firms are already using automation for increased efficiency, accuracy, and consistency:
 - Barclays is using RPA across various functions including accounts receivables, which saved the firm over 120 full-time employees and US\$250 million in bad debt provisioning.⁷
 - HSBC is restructuring its business to save up to US\$5 billion in cost and reduce workforce by around 25,000 people through automation and digital transformation. In 2015, the firm removed the requirement for 3,000 roles by automating and eliminating processes.⁸

Implications



- Firms traditionally cut costs in middle- and back-office operations by outsourcing the work to countries with cheap labor, but with the diminishing gap in labor costs across countries, this model is losing its charm, and RPA has the potential to take over day-to-day work for capital markets firms:
 - RPA could save firms up to 20% to 40% in labor costs while also eliminating the repetitive task of IT infrastructure workers.⁹
- With increasing regulations such as know your customer (KYC), Foreign Account tax Compliance Act (FATCA), Dodd-Frank, etc., that inflict a huge number of requirements that firms must meet, RPA can help firms in meeting their regulatory requirements:
 - The transactions are recorded and steps are systematically applied, which prevent manual errors and provide full transparency to auditors.

⁵ "IT Robotic Automation Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2014 - 2020", *Transparency Market Research*, March 18, 2015, accessed October 2016 at <http://www.transparencymarketresearch.com/it-robotic-automation-market.html>

⁶ "Robotic Process Automation Market Analysis", Grand View Research, October 2016, accessed October 2016 at <http://www.grandviewresearch.com/industry-analysis/robotic-process-automation-rpa-market>

⁷ "Banks at 'tipping point' as robots do back-office jobs", Tim Boreham, *The Australian*, April 7, 2016, accessed October 2016 at <http://www.theaustralian.com.au/business/financial-services/banks-at-tipping-point-as-robots-do-backoffice-jobs/news-story/80fe4d92f25d709bcd0b2a19ff844a59>

⁸ "HSBC automated nearly 3,000 jobs in 2015", Dereke du Preez, *diginomica*, February 22, 2016, accessed October 2016 at <http://diginomica.com/2016/02/22/hsbc-automated-nearly-3000-jobs-in-2015/>

⁹ "Robotic process automation: The new IT job killer?", Bob Violino, *InfoWorld*, March 23, 2015, accessed October 2016 at <http://www.infoworld.com/article/2898108/robotics/robotic-process-automation-new-it-job-killer.html>

Trend 07: Impact of Blockchain Technology

Blockchain technology is expected to change the way data is managed in capital markets.

Background



- Blockchain is a disruptive technology platform that uses public key cryptography and a distributed messaging protocol to create a shared ledger between trading counterparties to execute transfer of asset ownership or more complex transactions.
- It offers a paradigm shift to data management and sharing, and is being proposed as a solution to many of the inefficiencies afflicting the capital markets industry.

Key Drivers



- Blockchain-based architecture will enable capital markets participants to work on common datasets, in real time, and with minimal supporting operations, which will entail a simplified, cost-efficient, transparent, and robust system for all market participants.
- Regulators around the world are embracing the technology by actively engaging in open dialogue with the industry participants and offering a sandbox environment.

Trend Overview



- Blockchain is already being deployed to remove the inefficiencies in the current capital markets structure (see Exhibit 10).
- Blockchain-related spending in capital markets is expected to increase from US\$75 million in 2015 to US\$400 million by 2019.¹⁰
- Collaborative efforts to shift the existing value chain to blockchain are already starting, with potentially massive benefits such as:
 - **Ledger Consolidation:** Blockchain-based protocols will allow institutions with the ability to consolidate proprietary ledgers into a single data model for regulatory purposes.
 - **Faster Clearing and Settlement:** Blockchain technology could support compression of clearing and settlement helping reduce costs, and lowering counterparty settlement risk.
 - **Consolidated Audit:** Blockchains contain detailed and precise history of asset movements, which will help regulators combat money laundering or streamline customer order handling.
 - **Lowering of Systemic Risk:** Distributed ledgers virtually eliminate credit and liquidity risk by requiring pre-funding prior to trading.
 - **Mid- and Back-Office Efficiency:** Instrument standardization and alignment of terms in advance of blockchain trading would eliminate a number of middle- and back-office processes, including trade enrichment, error correction, before accessed allocations, and counterparty matching.

¹⁰ "The future of blockchain in 8 charts", Raconteur, June 27, 2016, accessed October 2016 at <http://raconteur.net/business/the-future-of-blockchain-in-8-charts>

- **Retention of Documentation:** Blockchain can enable smart contracts that will allow authorized parties instant access to records for verification, which will substantially reduce the transaction lifecycle that currently requires manual processes.

Exhibit 10: Applications of Blockchain



Corporate Finance: IPOs and Private Equity

- Private Securities Blockchain solution will enable Capital Markets firms to create Digital Assets for Private Securities and help in direct and immediate access and oversight by regulatory bodies
- NASDAQ has launched Linq – a blockchain based platform, to digitally manage shares in private companies

Securities Trading and Settlement

- Blockchain will enable the near-instantaneous settlement of transactions and automation of back offices of banks and free up billions in collateral that acts as insurance for trading
- ASX is committed to a blockchain-based replacement for their post-trade processes management system CHES, by end of 2017

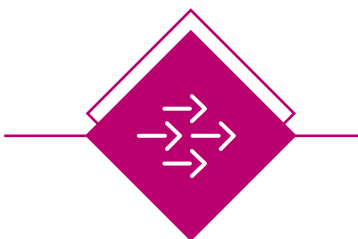
Reference Data Management

- Blockchain technology will eliminate the need for the reconciliation of reference data that facilitates regulators and network participants to view the creation, issuance, and amendment of records in real time
- R3 and Axoni are exploring blockchain technology to reduce risk in reference data management; the prototype enables buy- and sell-side to maintain governance of reference data

Source: Capgemini Financial Services Analysis, 2016

Implications

- Blockchain technology is expected to have a significant impact on the role of current participants:
 - **Clients** will hope to accrue the most benefit from the reduction in costs of capital markets dealing and securities servicing.
 - **Custodians** may see their role become limited to maintaining portfolio holdings in electronic format.
 - In a near-real-time post-trade processing and settlement environment, the role of **central counterparty clearing houses (CCPs)** would become limited.
 - **Dealers** will no longer provide market access, however, they will still play an important role in sourcing liquidity, price setting, advising, and execution management.
 - As the distributed ledger may become the primary destination for asset issuances, we may expect traditional **central securities depositories (CSDs)** to provide governance and independent verification of assets.
 - In **investment banking**, blockchain technology could facilitate issuer-led auctions of new securities, thereby reducing the investment banking fee.
 - There will be a surge of consortia created to manage the blockchain-driven activities, with a need to develop the appropriate governance.



Trend 08: Continued Growth in Adoption of Cloud-Based Solutions

Cloud-based solutions continue to gain more usage in capital markets.



Background

- Capital markets have lagged other industries in adopting cloud technology with the major concerns being security, legacy investments in custom applications, and siloed IT governance.
- As a result, cloud applications are mostly restricted to specific back- and middle-office activities, and, to some extent, to commoditized areas outside core systems.
- As a result of cloud computing's unique blend of scalability, flexibility, cost efficiency, and massive processing power, the technology is gaining application in capital markets.



Key Drivers

- Cloud-based solutions help attenuate the high cost of capturing a wide range of data along the transaction stream as required by new regulations.
- In the present market environment, where both buy-side and sell-side are witnessing diminishing margins, there is a renewed focus on achieving efficiencies and saving cost on IT infrastructure and systems.



Trend Overview

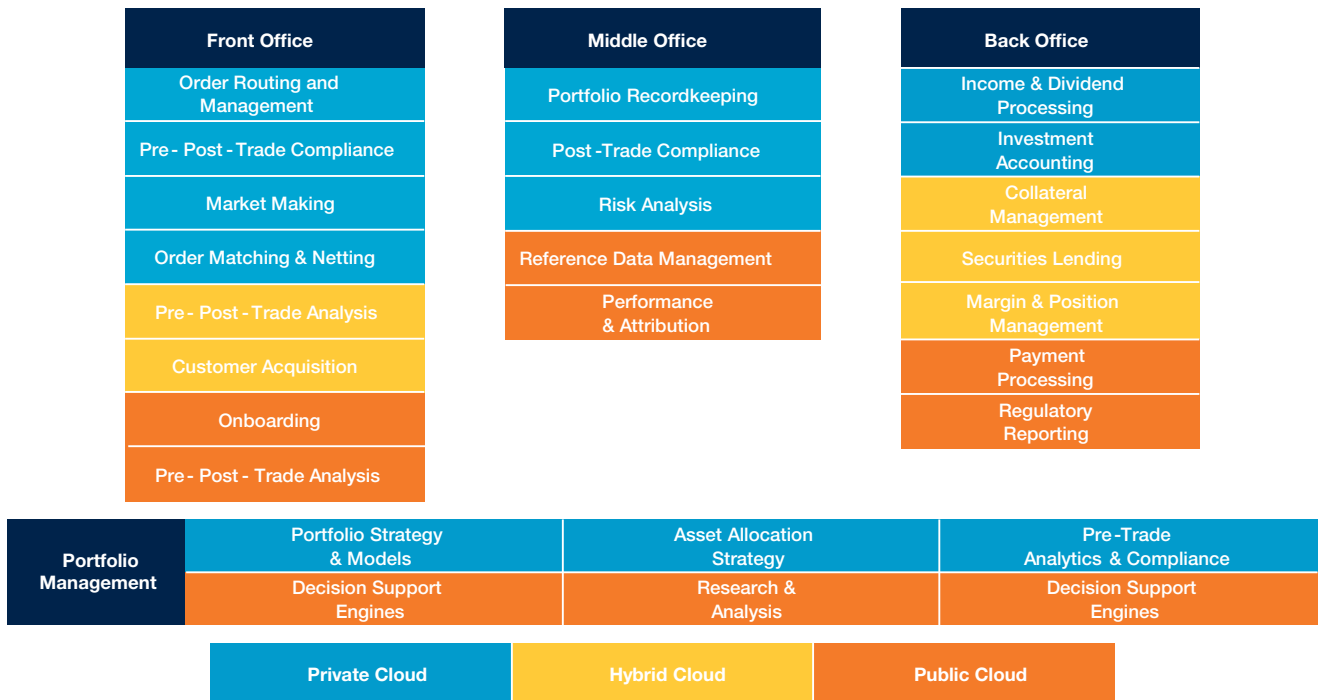
- Client demands for more cost-effective, agile, standardized, and secure services are making cloud adoption an attractive proposal for capital markets firms.
- Firms are adopting nimble and cost-effective cloud-based solutions to replace outdated and overly expensive infrastructure, processes, and application support.
- Barriers toward cloud adoption are being reduced as changing industry conditions bring cloud-style everything as a service (XaaS) models into the mainstream (see Exhibit 11).
- Big capital markets players have begun using cloud solutions:
 - DBS is adopting a hybrid cloud and has moved its treasury and markets business to the cloud to use for pricing and valuation of financial securities for risk management, and they plan to shift up to 50% of its compute workload to the cloud by 2018.¹¹
 - The Depository Trust & Clearing Corporation has migrated its data servers for its Avox Data Services to cloud—this follows an earlier move to use cloud service for real-time swaps data reporting.¹²
 - Bankinter uses cloud solutions as an integral part of their credit-risk simulation application, which is responsible for developing complex algorithms to simulate diverse scenarios in order to evaluate the financial health of its clients.¹³

¹¹ "DBS looks to the cloud to become more 'fintech-like'", Finextra, July 28, 2016, accessed October 2016 at <https://www.finextra.com/newsarticle/29235/dbs-looks-to-the-cloud-to-become-more-fintech-like>

¹² "DTCC shifts reference data services to AWS cloud", Finextra, July 13, 2016, accessed October 2016 at <https://www.finextra.com/newsarticle/29168/dtcc-shifts-reference-data-services-to-aws-cloud>

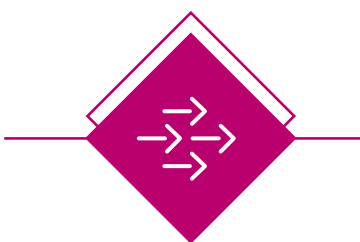
¹³ "AWS Case Study: Bankinter", Amazon Web Services, August 28, 2013, accessed October 2016 at <https://aws.amazon.com/solutions/case-studies/bankinter/>

Exhibit 11: Cloud Applications in Capital Markets



Source: Capgemini Financial Services Analysis, 2016

Implications



- As the data requirements increase for regulatory compliance, and new technology puts strains on the ability of legacy architecture to function in a dynamic trading environment, many firms are expected to shift their IT infrastructure to cloud-based models.
- The pay-per-use model is going to see an increase in adoption for capital markets-focussed solutions, since this helps turn IT-related capital expense into usage-based operational expense.
- Firms will have to form a cloud strategy that will segment business processes according to the sensitivity of information while deciding which type of cloud (public, private, or hybrid) will be the best fit.

Trend 09: Increasing Focus on Cybersecurity

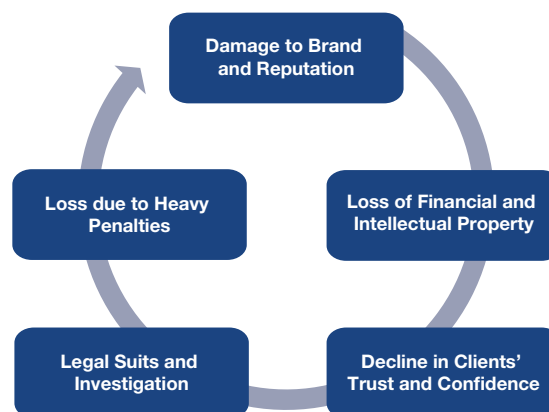
Cybersecurity continues to be a focus area for capital markets firms as digitization of various parts of the value chain is increasing risk exposure.

Background



- Capital markets firms possess enormous amounts of highly sensitive information, thus it becomes essential to uphold the data, as data loss can lead to significant reputational damage and monetary loss.
- The capital markets industry is one of the most affected by cyber threats, with an increase in the number and complexity of intrusions.
- Emerging technologies and reliance on third-party services, are increasing risk exposure.
- The consequences of data breach for firms cannot be understated (see Exhibit 12):
 - In 2016, the average cost of data breach incidents increased to US\$4.0 million.¹⁴

Exhibit 12: Threats Facing Capital Markets Firms Due to Failure to Address Cyber Crime



Source: Capgemini Financial Services Analysis, 2016

Key Drivers



- Proliferation of digital channels requires heightened security to prevent leakage of sensitive customer information.
- High risk of loss of sensitive data and corporate assets along with strategies and standards for security risk management.
- Firms' need to protect their brand reputations.

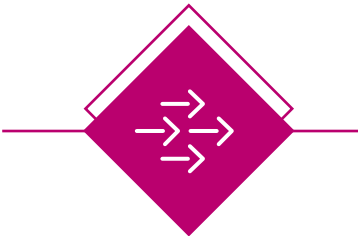
¹⁴ "2016 Ponemon Institute Cost of a Data Breach Study", Larry Ponemon, Security Intelligence, June 15, 2016, accessed October 2016 at <https://securityintelligence.com/media/2016-cost-data-breach-study/>

Trend Overview



- The financial services sector has been the prime target of cyber criminals over the last few years:
 - For example, in May 2016, Charles Schwab suffered through a small data breach when an unauthorized person logged into a number of user accounts, exposing clients' names, account numbers, stock positions, and transaction history.¹⁵
- It is essential for capital markets firms to increase spend on IT security to prevent the outbreak of cyber crime.
- In 2015, as well as 2014, financial services firms spent 22% of their overall IT budget in IT security.¹⁶
- Major financial institutions JPMorgan, Bank of America, Citigroup and Wells Fargo spend a collective US\$1.5 billion on cybersecurity annually.¹⁷
 - JPMorgan spent US\$250 million in cybersecurity in 2014 and expects to spend around US\$500 million in 2016.
 - Citi's IT-security budget exceeds US\$300 million per year.
 - Bank of America spent around US\$400 million on cybersecurity in 2015.
 - Wells Fargo spends roughly US\$250 million a year on cybersecurity.
- Firms are taking robust measures to enhance their cybersecurity efforts:
 - For example, eight of the largest U.S. banks are forming a group that seeks to tackle the growing cyber threat.¹⁸
- The worldwide cybersecurity market continues to grow as verified by market-sizing estimates ranging from US\$75 billion in 2015 to \$170 billion by 2020.¹⁹

Implications



- Capital markets firms need to have a mitigation plan to prevent data breach or cyber crime, as it results in damage to reputation, fines, legal suits, and loss of revenues in the long run.
- Firms will have to contemplate their structure and reporting arrangements for cybersecurity processes in the face of organized cyber criminal activities.
- Firms need to have strong internal control processes, as risk also arises from current and former employees.
- Collaborative efforts between various capital markets stakeholders to increase awareness of cybersecurity, privacy threats, and response tactics is necessary.

¹⁵ "Charles Schwab data breach exposed client investment data", Doug Olenick, SC Magazine, May 5, 2016, accessed October 2016 at <https://www.scmagazine.com/charles-schwab-data-breach-exposed-client-investment-data/article/528002/>

¹⁶ "Cybersecurity Budgets Remain Strong, Skills Lag In 2016", Forrester Research, Inc., March 24, 2016, accessed October 2016 at <https://www.scmagazine.com/charles-schwab-data-breach-exposed-client-investment-data/article/528002/>

¹⁷ "J.P. Morgan, Bank of America, Citibank And Wells Fargo Spending \$1.5 Billion To Battle Cyber Crime", Steve Morgan, *Forbes*, December 13, 2015, accessed October 2016 at <http://www.forbes.com/sites/stevemorgan/2015/12/13/j-p-morgan-boa-citi-and-wells-spending-1-5-billion-to-battle-cyber-crime/#7d4243071112>

¹⁸ "Big Banks Team Up To Fight Cyber Crime", *The Wall Street Journal*, August 10, 2016, accessed October 2016 at <http://www.wsj.com/articles/big-banks-team-up-to-fight-cyber-crime-1470758719>

¹⁹ "Cybersecurity Market Reaches \$75 Billion In 2015; Expected To Reach \$170 Billion By 2020", Steve Morgan, *Forbes*, December 20, 2015, accessed October 2016 at <http://www.forbes.com/sites/stevemorgan/2015/12/20/cybersecurity-market-reaches-75-billion-in-2015-expected-to-reach-170-billion-by-2020/>

Trend 10: Emergence of RegTechs

FinTech startups are increasingly specializing in specific part of regulations and collaborating with incumbents.

Background



- The growing regulatory scrutiny following the 2008 financial crisis has made it hazardous for firms to breach compliance norms whether by negligence or not.
- As a consequence of the requirements of new regulations, financial professionals' ability to focus on client needs is being hindered.
- Making regulations and compliance easier is one of the biggest immediate challenges banks and corporates face today.

Key Drivers



- With the evolving regulations across the globe, compliance and effective risk management are the biggest immediate challenges firms face today.
- Many times compliance and reporting-related activities divert attention from other key focus areas.
- Data management is also critical, as various regulations now mandate capital markets firms to store, organize, monitor, and report a stupendous amount of transactional and participant information:
 - Complying to dynamic regulations means firms must design a variety of data groupings with multiple hierarchies (including on existing data) about all historical financial data available to them for regulatory access in the future.
 - The need arises to have the ability to manage huge amounts of data and use analytics to process vast amounts of structured and unstructured data.
- RegTechs provide increased agility and nimbleness compared to older, more robust systems meant for a specific locked-down environment.

Trend Overview



- RegTech solutions are gaining prominence because incumbent firms are not able to cope with the overhaul in regulations since the financial crisis of 2008 (see Exhibit 13).
- Current growth in RegTechs is in one of three ways:
 - RegTechs that specialize in very specific parts of regulations, e.g., Fund Recs, provide solutions to automate the cash and portfolio reconciliation process that helps with compliance for the reporting requirements of Undertakings for Collective Investment in Transferable Securities (UCITS IV).²⁰
 - RegTechs that are partnering with incumbent firms to create a symbiotic environment that helps both, e.g., RegTech firm, Suade Labs, is helping small and medium banks in Europe to increase transparency and compliance with Basel III/CRD IV.²¹
 - Some incumbents themselves are pushing the boundaries by innovating and enhancing their services, e.g., Bloomberg has positioned its transaction cost analysis (TCA) solution as a service to help navigate the Market in Financial Instruments Directive (MiFID) II/MiFIR requirements.²²

²⁰ "Capita Asset Services moves to automated cash and portfolio reconciliation", Alan Meaney, privateequitywire, April 2, 2016, accessed October 2016 at <http://www.privateequitywire.co.uk/2016/02/04/236236/capita-asset-services-moves-automated-cash-and-portfolio-reconciliation>

²¹ "Suade helps the finance industry stay on the right side of regulations", *The Guardian*, accessed October 2016 at <https://www.theguardian.com/odine-partner-zone/2016/mar/22/suade-startup-finance-industry-regulations-odine-open-data>

²² "Regulation MiFID II", Bloomberg Professional, accessed October 2016 at <https://www.bloomberg.com/professional/mifid-ii/>

- RegTech presents itself as a business opportunity for capital markets firms to be able to differentiate themselves by lowering their operational costs, reducing exposure to regulatory fines, and offering seamless, integrated solutions to help meet regulatory obligations.

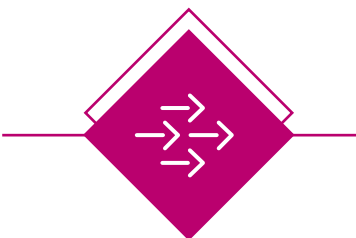
Exhibit 13: Evolution of RegTech



Source: Capgemini Financial Services Analysis, 2016

Implications

- The spending on compliance technology will increase over the next several years as the deadline for implementation of post-financial crisis regulations comes into force.
- RegTechs are expected to help banks become more efficient in compliance in the following key areas of regulation:
 - **Risk data aggregation:** The gathering and aggregation of high quality structured data from across the financial group is complicated by definitional issues and the use of incompatible and outdated IT systems.
 - **Modeling, scenario analysis, and forecasting:** Requirements for stress testing and risk management are becoming increasingly complex, with a vast array of risks, scenarios, variables, and methodological diversity that needs to be included.
 - **Trading in financial markets:** Regulatory tasks such as margin calculation, choice of trading venue, choice of central counterparty, and assessing the impact of a transaction on their institution's exposures requires automation to ensure compliance and enhance speed.
 - **Identifying and adapting to new regulations:** Implementing new compliance obligations across the organization is currently a labor-intensive and complex process, which could be enhanced through automated solutions to meet regulations.
 - **Client Onboarding & Due Diligence:** Governance issues around onboarding processes such as KYC, anti-money laundering (AML), as well as credit and legal due diligence can be made more streamlined and efficient.



References

1. “The future of equity research”, Bloomberg Professional, accessed October 2016 at <https://www.bloomberg.com/professional/blog/future-equity-research/>
2. “Collateral Management in Europe: Searching for Central Intelligence”, Euroclear, May 2015, accessed October 2016 at <https://www.euroclear.com/dam/Brochures/Euroclear-Collateral-Management-Aite-Paper.pdf>
3. “The Changing Collateral Space”, Manmohan Singh, International Monetary Fund, January 2013, accessed October 2016 at <https://www.imf.org/external/pubs/ft/wp/2013/wp1325.pdf>
4. “The emergence of regtech as a catalyst for innovation”, Devie Mohan, BankNXT, November 2015, accessed October 2016 at <http://banknxt.com/54653/regtech-innovation/>
5. “RegTech, the new magic word in FinTech”, Digital Economy Outlook, BBVA Research, February 2016, accessed October 2016 at https://www.bbvaresearch.com/wp-content/uploads/2016/02/DEO_Feb16-EN_Cap1.pdf
6. “Cloud Computing For The Financial Services Industry”, Abhinov Garg, Sapient Global Markets, accessed October 2016 at http://www.sapient.com/content/dam/sapient/sapientglobalmarkets/pdf/thought-leadership/GM_Cloud_Computing.pdf
7. “Robotic process automation: The new IT job killer?”, Bob Violiono, InfoWorld, March 23, 2015, accessed October 2016 at <http://www.infoworld.com/article/2898108/robotics/robotic-process-automation-new-it-job-killer.html>
8. “Are You Ready for the Cybersecurity Challenges of 2016?”, Penny Crosman, American Banker, January 5, 2016, accessed October 2016 at <http://www.americanbanker.com/news/bank-technology/are-you-ready-for-the-cybersecurity-challenges-of-2016-1078663-1.html>
9. “Cybersecurity Budgets Remain Strong, Skills Lag In 2016”, Forrester Research, Inc., March 24, 2016, accessed October 2016 at <https://www.forrester.com/report/Cybersecurity+Budgets+Remain+Strong+Skills+Lag+In+2016/-/E-RES121569>
10. “Big Data and data management in capital markets”, Banking Technology, May 19, 2014, accessed October 2016 at <http://www.bankingtech.com/221932/big-data-and-data-management-in-capital-markets/>

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