

Top Trends in Capital Markets: 2020

What you need to know



TABLE OF CONTENTS

Introduction	3
Trend 01: Artificial intelligence to enhance pricing decisions in bond securities trading	4
Trend 02: Capital market firms leverage blockchain technology to enhance data transparency	6
Trend 03: Digital securities – a new generation of assets	8
Trend 04: Robotic process automation simplifies client onboarding	10
Trend 05: Quantamental investing: New buy-side trend is gaining ground	12
Trend 06: Common domain model aims to standardize derivatives trading and management	14
Trend 07: Capital markets set to transition away from London Interbank Offered Rate	16
Trend 08: Machine learning will boost automation in capital markets	18
Conclusion	20
References	21
About the Authors	22

Introduction



A host of regulatory changes were introduced globally in 2019 to bring about greater transparency in the capital markets industry. Regulatory changes are forcing capital markets to innovate and undertake initiatives to ensure cost-effective and efficient compliance. Whether it be derivatives market consistency or transitioning from LIBOR, capital market firms are moving to **data-driven compliance** to ensure standards in the use, distribution, and protection of valuable customer data. Quantamental investing approaches and digital security tokens are going to have an impact on the broader audience.

Customer engagement and satisfaction have been a burning issue for the industry for quite some time. Firms are under pressure to improve customer service, especially within today's competitive landscape. Therefore, capital market participants are adopting artificial intelligence (AI) to drive **intelligent solutions** to streamline and optimize current operational processes. RPA solutions are being leveraged for simplifying client onboarding, while blockchain technology is helping firms to improve transparency, manage risks, and enable greater operational efficiency.

Exhibit 1: Capital market influencers

Artificial intelligence to enhance pricing decisions in bond securities trading		Intelligent solution	
Capital markets firms leverage blockchain technology to enhance data transparency			
Digital securities – a new generation of assets			
Robotic process automation simplifies client onboarding			
Quantamental investing: New buy-side trend is gaining ground		Data driven compliance	
Common domain model aims to standardize derivatives trading and management			
Capital markets set to transition away from London Interbank Offered Rate			
Machine learning will boost automation in capital markets		Deep customer insights	

Source: Capgemini Financial Services Analysis, 2019

Firms must understand customers' demands and generate insights to anticipate needs and enhance satisfaction. **Deep customer insights** will enable firms to develop products with strong value propositions based on information generated via analysis of vast amounts of data.

Top Trends in Capital Markets: 2020 aims to understand and analyze the top trends in the Capital Markets this year and beyond.

Trend 01: Artificial intelligence to enhance pricing decisions in bond securities trading

Capital market firms to automate bond pricing and risk management by leveraging AI predictive analytics for better pricing and liquidity in the market.

Background



- Over the years, due to liquidity issues and irregular trading, it has been challenging to gather bond valuation information.
- Markets rely on isolated manual processes between various trading parties, resulting in different data sets and information irregularities, and decentralization.
- Because free quotes are not available, the best way to get a quotation is to ask multiple brokers and wait for responses. Another way is to approach data companies that provide required data after the close of market.

Key Drivers



- Market data centralization would hedge against information anomalies and allow the use of advanced analytics to boost overall fixed-income market efficiency (Exhibit 2).
- The absence of market liquidity makes bond price prediction difficult because of limitations in referencing historical prices and similar liquid bonds.
- Bond trading tends to be more complicated compared with equities trading because each bond has unique legal and financial features.

Exhibit 2: Drivers for automation of bond pricing



Source: Capgemini Financial Services Analysis, 2019

Trend Overview



- Historically, bonds trading price transparency has been a concern because massive information disparity exists between trading equities versus bonds.
- Regulatory changes may alleviate challenges and difficulties around market and price discovery to bring more transparency to the market.
 - The U.S. Securities and Exchange Commission’s N-Port regulation makes it compulsory for buy-side entities to report the price and liquidity mark of the bonds.¹ MiFID II, which rolled out in Europe in January 2018, also is expected to encourage more market transparency.²
- Firms are leveraging solutions that combine statistics and AI-empowered algorithms. These solutions can scan through entire trade histories in secondary markets while also referencing bonds within other groups to allocate value and liquidity metrics.
 - Overbond, a Canadian FinTech, launched *COBI* (corporate and government bond intelligence) in 2019 to help maintain regulatory compliance while automating bond pricing and liquidity risk management.
 - Its suite of algorithms and analytics tools systematically price primary bond quotations and secondary market bonds.³

Implications



- AI will help firms automate mid- and back-office tasks and also meet regulatory compliance.
- Firms can leverage AI to increase transactions through better decision making, enhanced bond-trading performance, and a reduction in operating costs.
 - ING’s predictive analytics tool Katana has led to faster pricing decisions in 90% of trades and a 25% reduction in trading costs. Moreover, ING traders quadrupled their frequency for offering clients the best prices.⁴
- With more RFQs (request for quote) from investors and for lower magnitudes, capital market firms can make quick decisions and trade smaller tickets more frequently with the help of AI-backed algorithms.

¹ Financial Pipeline, “How Artificial Intelligence can help price bonds in an illiquid market,” Romina Maurino, January 2019, <https://www.finpipe.com/how-artificial-intelligence-can-help-price-bonds-in-an-illiquid-market>.

² Markets Media, “ING Brings AI to Bond Trading,” Shanny Basar, November 26, 2018, <https://www.marketsmedia.com/ing-bank-provides-buy-side-with-ai-for-bond-trading>.

³ PR Newswire, “Overbond solves for SEC N-PORT regulatory requirement with new bond pricing and liquidity risk management automation,” January 15, 2019, <https://www.prnewswire.com/in/news-releases/overbond-solves-for-sec-n-port-regulatory-requirement-with-new-bond-pricing-and-liquidity-risk-management-automation-832775794.html>.

⁴ ING, “Katana gives bond traders a cutting edge,” December 12, 2017, <https://www.ing.com/Newsroom/All-news/Katana-gives-bond-traders-a-cutting-edge.htm>.

Trend 02: Capital market firms leverage blockchain technology to enhance data transparency

The decentralized structure of blockchain technology will strengthen information flow and transparency by building trust in capital markets systems.

Background



- Financial institutions restricted data records storage to avoid security lapses. However, limited data led to reduced transparency and optimization across many organizations.
- Information flow is critical for smooth functioning within the capital markets industry. If information is blocked, market chaos can result.
- Naturally decentralized, blockchain technology ensures databases are secured and difficult to breach while also making information readily available upon demand.

Key Drivers



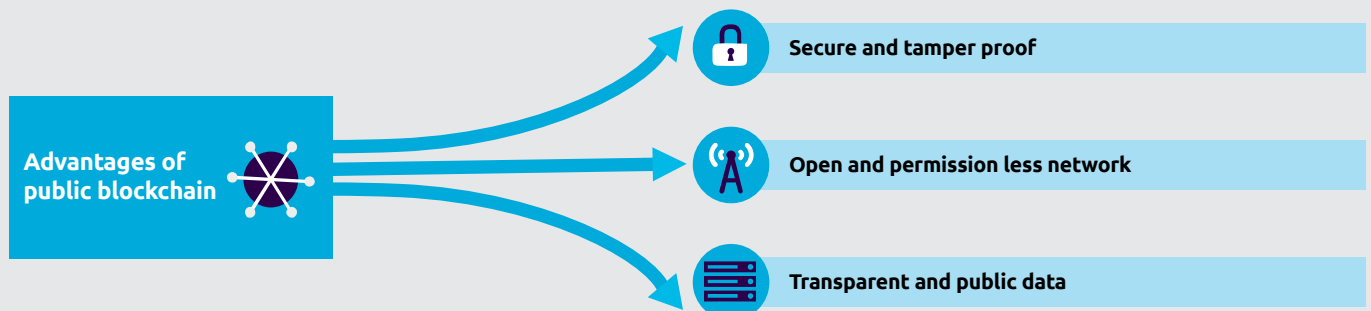
- The global financial system is a loosely joined network of multiple geographies of jurisdictions that, when crossed, expose participants to risks and operational costs.
- Capital markets firms are facing numerous problems in the areas of identity management, trust factors, system transparency, and lack of availability of high-quality data.
- Traditional methods of storing data are not very reliable and have a high probability of data tampering.

Trend Overview



- Blockchain offers the essential capability to store data in a tamper-proof manner while making it accessible among various stakeholders. It provides transparency and data traceability while preventing fraud at the same time.
- Public blockchain prevents influence from being concentrated at a single point. Instead, it distributes transaction authentication throughout the network, which makes ledger manipulation difficult (Exhibit 3).

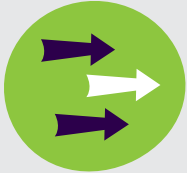
Exhibit 3: Advantages of public blockchain



Source: Capgemini Financial Services Analysis, 2019

- To successfully pull off a 51% attack on the Bitcoin ledger (the most popular public blockchain network), estimates suggest perpetrators would have to spend around US\$1.4 billion.⁵
- Companies that adopt blockchain technology will completely control their data and assets, accessible only through a set of private keys.

Implications



- The sustained expansion of innovative solutions in the public blockchain domain will help capital market firms address concerns around regulatory compliance, scalability, and privacy.
- Capital market firms will be able to settle transactions and processing more efficiently because all market participants will have access to the same data and real-time updates.
- When all participants gain visibility to similar data, organizations will reduce costs significantly while achieving operational efficiency because less reconciliation will be necessary.

⁵ Cryptoslate, "Analysis: Bitcoin Costs \$1.4 Billion to 51% Attack, Consumes as Much Electricity as Morocco," Mitchell Moos, November 29, 2018, <https://cryptoslate.com/analysis-bitcoin-costs-1-4-billion-to-51-attack-consumes-as-much-electricity-as-morocco>.

Trend 03: Digital securities – a new generation of assets

Amid increasing regulatory mandates, the ability to issue and trade securities digitally will bolster task automation and improve performance.

Background



- End-to-end capital market processes have not been digitized to enable low-cost, frictionless pre-trade processes and more efficient post-trade activity.
- Traditional systems at the heart of capital markets are costly and opaque. Settlement is slow and inefficient and includes many intermediaries.
- As raising capital becomes increasingly difficult, digital security offerings (DSOs) can help revolutionize the processes while supporting compliance.

Key Drivers



- Digitizing securities and using smart contracts enable automation of the applicable financial markets' rules and regulations that can be customized further.
- Investors are increasingly interested in a more transparent, cost-effective, and secure system, which securities tokenization can offer.
- Tokenization can significantly simplify governance processes through voting or securities payout distribution, which will improve efficiency and reduce processing fees.

Trend Overview

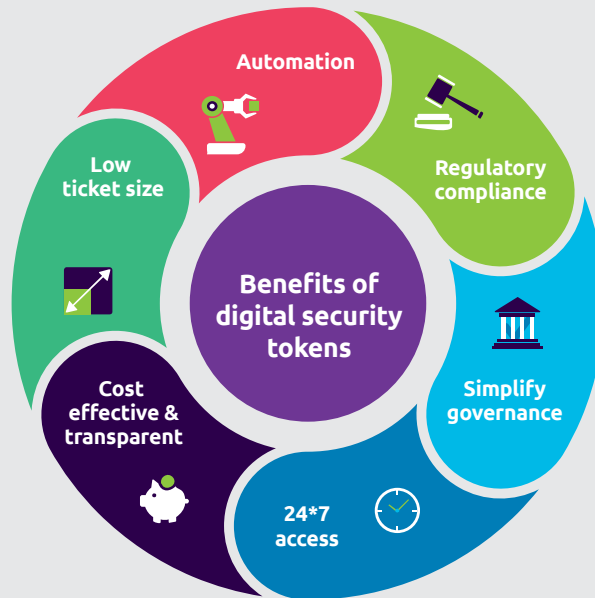


- Digital or tokenized securities are a version of digital ownership built on blockchain-based technologies governed by smart contracts for various public or private equities, debt, real estate, fractional ownership, or other assets.
- While regulators across the globe attempt to manage crypto markets and figure out how to apply existing laws, tokenized securities offer the opportunity for more compliance and control.
 - New York-based VStock Transfer, through Vtoken, has been working to integrate the potential of blockchain technology within the existing regulatory infrastructure.⁶
- Regulatory benefits will promote the advantages of global security token standards and create opportunities for issue-side participants to reach out to a more extensive set of potential investors (Exhibit 4).
- As digital securities gain steam in the financial markets, stakeholders are investing heavily in projects that support the issuance, exchange, and custody of digital securities.
 - According to the Kepler Finance database, investors have poured more than \$640 million in companies developing technology to mainstream the digitization of assets and securities.⁷

⁶ Forbes, "When Will We See the Emergence of Digital Securities?" Jim Preissler, February 20, 2019, <https://www.forbes.com/sites/jpreissler/2019/02/20/when-will-we-see-the-emergence-of-digital-securities/#33e53c8966e5>

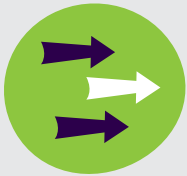
⁷ Hackernoon, "Digital Securities Market Research 2019 by Kepler Finance," Kepler Finance, February 4, 2019, <https://hackernoon.com/digital-securities-market-research-2019-by-kepler-finance-aab927734f80>.

Exhibit 4: Benefits of digital security tokens



Source: Capgemini Financial Services Analysis, 2019

Implications



- Investors will get access to regulated digitized securities along with full-time access to markets and exchanges, which will help to manage digital assets better.
- There will be increased collaboration between digital-assets trading platforms and market-compliant payment solution providers. Recently, KoreConX partnered with POSConnect to provide users with an advanced and secure payment solution.⁸
- As standardized regulations become the norm, and firms install trusted platforms, mainstream adoption of digital securities seems inevitable.
- REITs and major equities players will benefit from the value of newly enabled liquidity.

⁸ Digital Securities, "KoreConX partners with Broker-Dealer Payment Infrastructure POSConnect," September 12, 2019, <https://digitalsecurities.com/koreconx-partners-with-broker-dealer-payment-infrastructure-posconnect>.

Trend 04: Robotic process automation simplifies client onboarding

Capital market firms are leveraging robotic process automation (RPA) solutions in client onboarding processes with an eye on improved customer satisfaction and increased revenue.

Background



- Until now, the manual processes required for client onboarding was a costly endeavor for most capital market firms.
- A shift is now underway with increased use cases for RPA and intelligent automation in client onboarding to minimize human intervention and manual errors.
- Firms can leverage RPA solutions to streamline the process across service verticals to deliver the best possible customer experience.

Key Drivers



- The ever-changing regulatory compliance and legislations are keeping capital market firms on their toes to ensure modifications in their KYC processes for compliance.
- Firms are under pressure to reduce their KYC-related operational spends, forcing them to undertake transformational efforts related to KYC processes.
 - Large financial institutions spent approximately US\$150 million on KYC compliance and procedures in 2017, which can increase to US\$670 million, with the inclusion of remediation programs.⁹
- To sustain in today's complex and competitive financial markets, firms need to enhance efficiency in operations and improve profitability and client experience.

Trend Overview

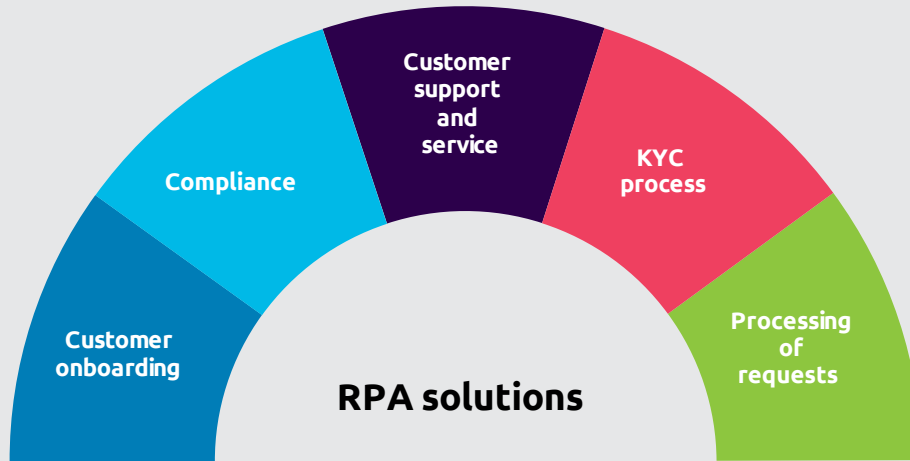


- In capital markets firms, RPA use is confined mostly to tasks that are simple, manual, high volume, and prone to human error. For example, in the client onboarding process, digital RPA tools can be used to efficiently onboard new clients (e.g., e-signatures, KYC authentication, automation in back-office tasks) (Exhibit 5).
- RPA bots can use their advanced capabilities to handle time-consuming firm processes in client onboarding, such as data extraction and validation, to simplify and eliminate multiple steps.
- RPA has enabled many firms to automate their client onboarding processes:
 - Danske Bank leveraged RPA to automate its customer onboarding process by developing a robot that transfers information gathered during advisor/customer meetings. With RPA, the bank reduced data entry during onboarding from 20 to 30 minutes to a few seconds.¹⁰

⁹ Refinitiv, "The cost benefits of KYC managed services," October 10, 2018, <https://www.refinitiv.com/perspectives/financial-crime/the-cost-benefits-of-kyc-managed-services>.

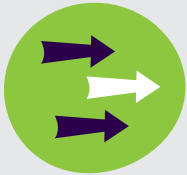
¹⁰ Cloud Storm, "Automating Banking: 3 RPA Use Cases in Finance," Robert Blessing, April 18, 2019, <https://cloudstorm.io/automating-banking-rpa-use-cases-in-finance/>.

Exhibit 5: RPA in client onboarding



Source: Capgemini Financial Services Analysis, 2019

Implications



- RPA can reduce or eliminate manual tasks in client onboarding so that employees are free to focus on other tasks.
- With customer-centricity a priority, there is a more significant push toward making onboarding an enriching client experience. Thus, CRM opportunities provide a broader play for RPA and can drive spending for firms in such technologies.
- Firms will benefit in terms of regulations and financial risk management, where RPA solutions will help in scanning account opening and statements subject to the appropriate level of reviews.
- RPA will help firms manage financial risk better because robots can recognize and raise flags in cases of risk exposure and identify the causes.

Trend 05: Quantamental investing: New buy-side trend is gaining ground

Quantamental investing is a stock-picking approach that combines quantitative and fundamental investing techniques to enable high-yield decision making.

Background



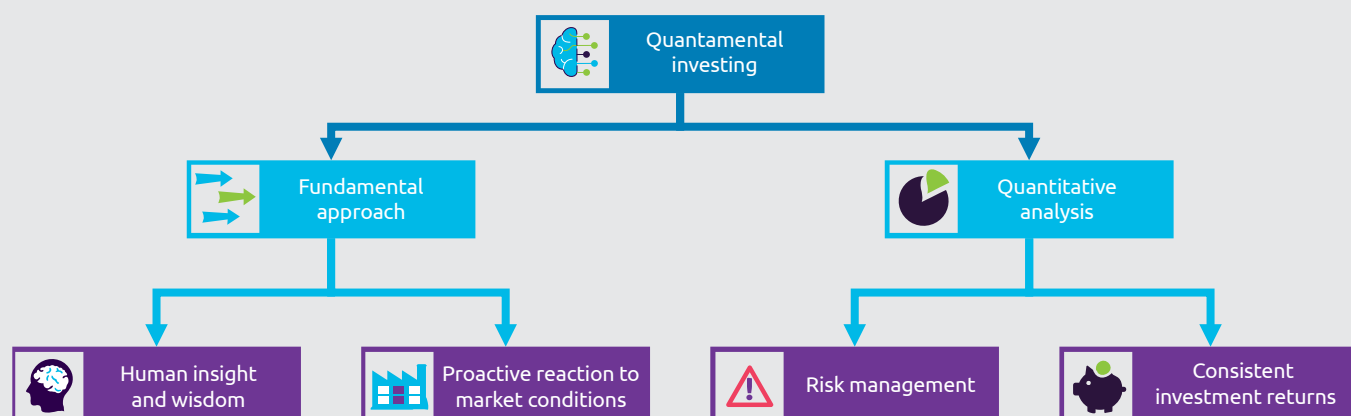
- Traditionally, fundamental investing involved studying financial statements, industry trends, and economic data to make decisions. On the other hand, quantitative investing relied on mathematical and statistical modeling to gain investment insight.
- Even the most market-savvy and experienced fundamental research stock pickers cannot promise winning combinations every time. With quantitative analysis, trading costs may rise to minimize risk because portfolios require a high number of stocks.
- Recently, however, investment firms such as US-based Black Rock and few others have combined these methods to extract the value of big data in quantitative methods and the professional wisdom of experienced managers who use fundamental approaches.¹¹ The resulting hybrid is called *quantamental* investing.

Key Drivers



- Asset managers following active management are under pressure due to the underperformance of their benchmarks, while passive funds are gaining popularity.¹²
- Fundamental asset managers cannot analyze the considerable gamut of data available and are also vulnerable to emotional biases towards a stock.
- Advancement in data analytics-based technologies such as AI and ML has made it easier for firms to implement quantamental techniques (Exhibit 6).

Exhibit 6: Advantages of quantamental investing



Source: Capgemini Financial Services Analysis, 2019

¹¹ Data Driven Investor, "The Future of Investing is Quantamental," Bingran Lu, May 2, 2019, <https://www.datadriveninvestor.com/2019/05/02/the-future-of-investing-is-quantamental/>.

¹² Business Day, "Quantamental investing could best create value for pensioners," Ndinavhushavhelo Rabali, July 25, 2019, <https://www.businesslive.co.za/bd/opinion/2019-07-25-quantamental-investing-could-best-create-value-for-pensioners>.

Trend Overview



- Human insight is essential to the adoption of changing trends – and quantitative analysis complements the human thought process.
 - For example, several quantitative funds could not gauge the sudden business environment change during the 2008 financial crisis and were reliant upon past data to make decisions – thereby necessitating flexible human insights.¹³
- More and more asset managers are adopting quantamental investing for better assessment of stocks and securities, and risk management.
 - JPMorgan has set up a new data lab in its *intelligent digital solutions* division to expand the capabilities of its portfolio managers, rather than replace them entirely with AI.¹⁴
 - A model deployed by Bank of America Merrill Lynch, *Alpha Surprise*, applies a quantitative overlay to forecasts by the firm’s fundamental analysts. Reportedly, this strategy has helped the investment bank beat the S&P 500 index benchmark 23 times in the past 30 years.¹⁵
- Quantamental investing will address the chances of error originating from behavioral biases.
 - London-based startup Essentia Analytics uses ML to crunch historical trading decisions and recognize behavior patterns based on statistics that may have impacted past portfolio performance. This helps asset managers make more informed decisions to drive investment performance improvement.¹⁶

Implications



- Firms will be able to leverage quantamental strategy to validate an existing hypothesis or better manage risks by building rigorous statistical models. It will help in delivering consistent investment returns along with reducing volatility.
- However, while transitioning to quantamental investing, capital market firms may witness some challenges such as initial high investment in alternative data and shortage of skilled resources.

¹³ Ibid.

¹⁴ Data Driven Investor, “The Future of Investing is Quantamental,” Bingran Lu, May 2, 2019, <https://www.datadriveninvestor.com/2019/05/02/the-future-of-investing-is-quantamental/>.

¹⁵ Market Watch, “The next frontier in investing is ‘quantamental’ stock picking,” William Watts, October 29, 2018, <https://www.marketwatch.com/story/the-next-frontier-in-investing-is-quantamental-stock-picking-2018-10-03>.

¹⁶ Essentia Analytics, <https://www.essentia-analytics.com>, accessed September 2019.

Trend 06: Common domain model aims to standardize derivatives trading and management

The common domain model (CDM) creates a universal blueprint for how derivatives trade events and processes are represented — paving the way for greater automation and efficiency at scale.¹⁷

Background



- Until now, capital market firms have maintained their own set of systems and representations for events and processes related to derivatives trading.
- However, manual processes make the reconciliation of critical data across multiple stakeholders a challenge.
- Data and processes standardization in the derivative trading market will help participants process data more efficiently.

Key Drivers



- Organizations need to continuously settle their trades to ensure consistent information, which requires human resources and poses a threat of operational risk.
- The current derivatives market infrastructure is complicated, manually intensive, and costly to maintain, which doesn't provide much scope for scalability.
- With standardization in the derivative trade markets, new technologies can potentially add better automation and efficiency to reduce trading costs and intricacies.

Trend Overview



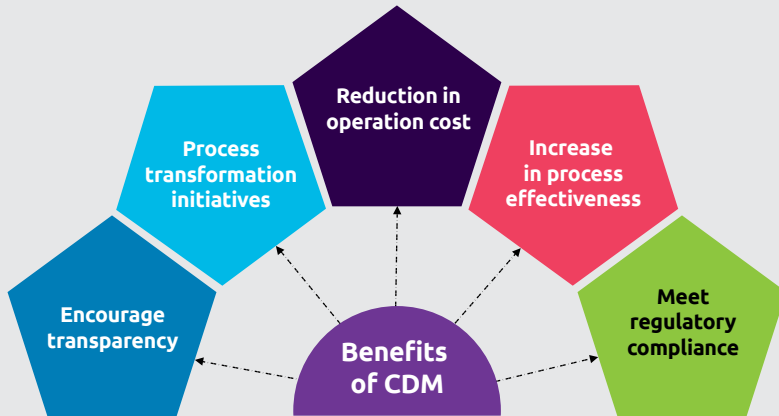
- Actions and processes involved in the derivatives trading lifecycle are standardized by the ISDA's CDM, ensuring consistency of data within its format.
- To realize CDM's full potential, all industry stakeholders (investment banks, buy-side institutions, technology providers, etc.) must collectively participate and build upon the standards (Exhibit 7).
- Because distributed ledger technology (DLT) is built around a common platform to store and process information, it has promising potential in the CDM infrastructure.
 - Operations and technology infrastructure costs for the derivatives market are estimated at around US\$3 - 7 billion. The use of advanced technology, such as DLT, to manage and process standardized data, can reduce costs by 50%.¹⁸
- CDM will be a critical enabler to build next-generation derivatives trading infrastructure. More proofs of concept and various test cases are expected along the path to scaleup.
 - Regulatory FinTech REGnosys is assisting ISDA in developing the framework for a digital CDM version, which will be demonstrated and tested with various new technologies.¹⁹

¹⁷ The International Swaps and Derivatives Association (ISDA) common domain model (CDM) is a digital representation of derivatives trade events that aims to improve the way derivatives are managed while also establishing a standard for newer technologies such as distributed ledger.

¹⁸ Global Capital, "Learning Curve: ISDA Common Domain Model," Costas Mourselas, May 24, 2018, <https://www.globalcapital.com/article/b18971m4pfrzf1/learning-curve-isda-common-domain-model>.

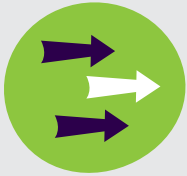
¹⁹ ISDA, "ISDA Appoints REGnosys to Develop Digital Common Domain Model," February 15, 2018, <https://www.isda.org/2018/02/15/isda-appoints-regnosys-to-develop-digital-common-domain-model/>.

Exhibit 7: CDM benefits



Source: Capgemini Financial Services Analysis, 2019

Implications



- Derivatives market participants will be able to considerably cut costs and increase the effectiveness of all back-office processes.
- Financial institutions will be able to undertake process transformation initiatives using emerging technologies, such as AI, DLT, and cloud, to work in conjunction with legacy technologies.
- CDM will encourage transparency and help different stakeholders better align to ensure efficient regulatory compliance.

Trend 07: Capital markets set to transition away from London Interbank Offered Rate

Participants must proactively manage their London Interbank Offered Rate (LIBOR) phase-out to avoid market disruption.

Background



- A global benchmark interest rate calculated in five currencies, LIBOR has been plagued by a rate-rigging scandal.²⁰ More than US\$240-trillion worth of derivatives, loans, and bonds are priced off LIBOR, with US-dollar LIBOR alone referenced at about \$200 trillion of outstanding financial products.²¹
- After the 2008 global recession, apprehension arose about the manipulation of LIBOR through alleged collusion by major banks.²²
- Hefty fines were levied against large institutions, and several senior bank executives (including CEOs from two large banks) resigned.
 - In July 2017, the UK Financial Conduct Authority announced that banks would no longer need to submit rates for LIBOR calculation after 2021, leaving market participants uncertain about alternatives.²³

Key Drivers



- Built on a survey through which banks and institutions quote the borrowing rate of interest among each other, LIBOR is a self-regulated mechanism vulnerable to exploitation and defects.
- Banks withdrew from interbank lending rates after the recession, which reduced activity in LIBOR-backed markets.
- Now, a new benchmark to improve transparency and minimize volatility is a critical need.

Trend Overview



- Throughout 2019 awareness was heightened, and banks were encouraged to prepare for the transition from LIBOR to a new benchmark rate by 2021.
- With the decline in LIBOR-backed loans, regulators are focusing on reducing market dependence on LIBOR because its sudden absence could significantly impact financial stability in the markets.

²⁰ The London Interbank Offered Rate (LIBOR) scandal involves some banks reporting artificially low or high interest rates to benefit their derivatives traders. Because LIBOR is also used as an indicator of a bank's health, some firms made themselves appear stronger than they actually were by reporting fraudulent rates.

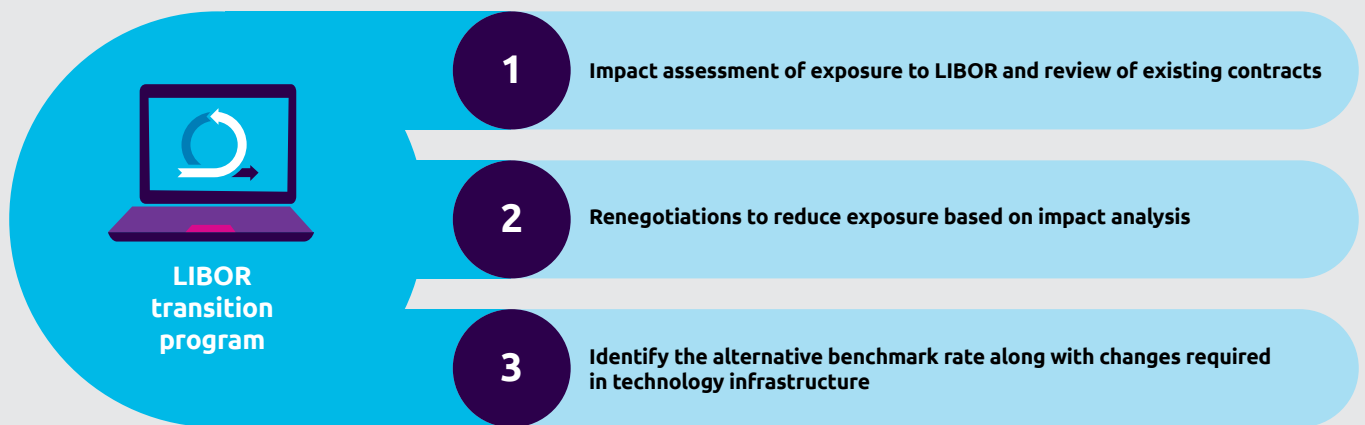
²¹ The Economist, "LIBOR is due to die in 2021. Hurry up and drop it, say regulators," June 8, 2019, <https://www.economist.com/finance-and-economics/2019/06/08/libor-is-due-to-die-in-2021-hurry-up-and-drop-it-say-regulators>.

²² Treasury & Risk, "LIBOR Replacement Contenders," Alexandra Harris, April 03, 2019, <https://www.treasuryandrisk.com/2019/04/03/libor-replacement-contenders/?slreturn=20190829061400>.

²³ Mondaq, "United States: Early Trends for LIBOR Replacement in The U.S. Market," Oscar Stephens and Andrew Ceppos, April 2019, <http://www.mondaq.com/unitedstates/x/797218/Commodities+Derivatives+Stock+Exchanges/Early+Trends+For+LIBOR+Replacement+In+The+US+Market>.

- It is still unclear about the replacement for LIBOR, as different countries are selecting various benchmarks: SONIA in Britain, TONAR in Japan, and SARON in Switzerland.²⁴
 - In the United States, the Alternative Reference Rates Committee selected the Secured Overnight Financing Rate (SOFR) in June 2017.²⁵
 - The World Bank priced its first SOFR linked bond in August 2018, raising US\$1 billion from investors in the Americas and Europe.²⁶
- Major banks and institutions must create a LIBOR transition plan by evaluating the impact and identifying suitable alternative benchmarks (Exhibit 8).
 - Different benchmarks may be adopted in the five main markets – the UK, the United States, Europe, Switzerland, and Japan. An all-in-one benchmark may not be necessary or even possible. Instead, multiple references may coexist.

Exhibit 8: Considerations for LIBOR transition program



Source: Capgemini Financial Services Analysis, 2019

Implications



- Calculation rates between LIBOR and proposed alternatives are likely to differ. Therefore, financial firms might have to bear considerable costs and risks while transitioning to the new method. They will also have to conduct a risk assessment of legacy contracts linked to LIBOR.
- Firms may face communication challenges with retail clients because most have a limited understanding of LIBOR, and the transition to alternatives will create additional confusion.
- Institutions focusing on derivatives markets with exposure to LIBOR will eventually move to a new, less risky rate because support for the legacy benchmark will ultimately disappear.

²⁴ SONIA: Sterling Overnight Index Average, is the effective overnight interest rate paid by banks for unsecured transactions in the British sterling market; TONAR: Tokyo Overnight Average Rate, is an unsecured interbank overnight interest rate and reference rate for Japanese yen; SARON: Swiss Average Rate Overnight, represents the overnight interest rate of the secured funding market for the Swiss Franc.

²⁵ Economic Times, "Saying goodbye to Libor the world's most valuable benchmark," Kuntal Sur, May 28, 2019, <https://economictimes.indiatimes.com/markets/stocks/news/saying-goodbye-to-libor-the-worlds-most-valuable-benchmark/articleshow/69532390.cms?from=mdr>.

²⁶ The World Bank, "World Bank Launches Market's First SSA Secured Overnight Financing Rate (SOFR) Bond," August 14, 2018, <https://www.worldbank.org/en/news/press-release/2018/08/14/world-bank-launches-markets-first-ssa-secured-overnight-financing-rate-sofr-bond>

Trend 08: Machine learning will boost automation in capital markets

Machine learning (ML) is helping to identify patterns and analyze behaviors to support empirical data-driven decision making.

Background



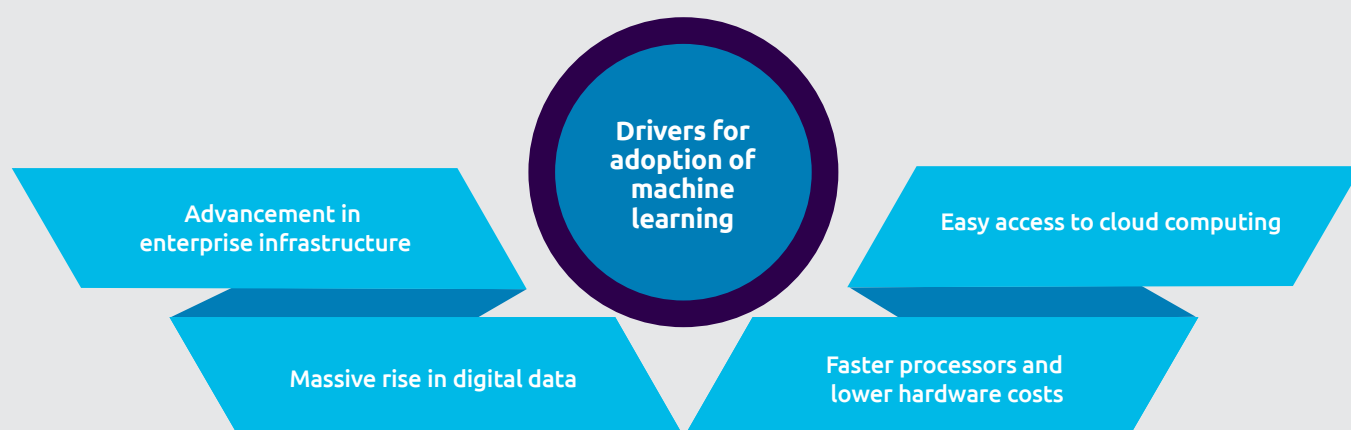
- Until now, most data analysis and behavior modeling of participants and prices were done by humans by managing risk while exploiting information.
- With the vast amount of data generated in today's dynamic environment, ML can help in processing and synthesizing the data to create valuable insights.
- ML allows the creation of dynamic models capable of predicting outcomes that are more reliable and accurate while simultaneously automating the process.

Key Drivers



- ML speeds data processing, which will help firms to extract quality information, enhance productivity, and reduce cost.²⁷
- With the rise in digital data, real-time insights become very important for better decision making and understanding of markets and consumer behavior.
- Advancement in enterprise infrastructure and easy access to cloud computing have enhanced the capability to analyze data for generating insights and developing models (Exhibit 9).

Exhibit 9: ML adoption drivers



Source: Capgemini Financial Services Analysis, 2019

²⁷ Refinitiv, "Use of machine learning becomes the new norm for financial community as sector builds smarter machines to drive competitive advantage," April 8, 2019, <https://www.refinitiv.com/en/media-center/press-releases/2019/april/use-of-machine-learning-becomes-the-new-norm-for-financial-community>.

Trend Overview



- ML helps to automate repetitive, slightly complex processes such as answering customer queries across multiple markets (including the use of chatbots for high-volume transactions), which otherwise is a challenge.
 - In 2018, Deutsche Bank launched *Debbie*, its first securities services chatbot – a mechanized solution to quickly and securely deliver clients' trade status.²⁸
 - Bank of America's *Erica* chatbot helps customers with simple transactions, ranging from money transfers to balance inquiries. Erica surpassed six-million users in 2019 and handled more than 35-million client requests.²⁹
- Voice-enabled chatbots powered by ML programs using NLP also can be used to deliver personalized financial services. Bot systems analyze a client's financial data, spending patterns, etc. to recommend suitable products.
- Automated investment advice is another area in which ML is making an impact with the help of robo-advisors. Robo advisors use ML algorithms to manage investment funds along with brokerage and investing services.
 - Charles Schwab's automated investment platform leverages robo advisors to assist clients in portfolio construction. No advisory fees and commissions are charged with an option to invest in low-cost traded funds.³⁰

Implications



- Hedge fund managers are leveraging the technology of ML and human decision making to deliver smarter investment choices.³¹
- Firms can save costs by leveraging ML, specifically by automating various support and core functions while delivering its fundamental value proposition as a prediction technology.
- Firms can collaborate with FinTechs or tech giants for solutions versus costly unilateral attempts to develop algorithms and models.

²⁸ Deutsche Bank, "Could a chatbot help resolve the speed and accuracy need in trade queries?" August 2018, <https://cib.db.com/insights-and-initiatives/flow/could-a-chatbot-help-resolve-the-speed-and-accuracy-need-in-trade-queries.htm>.

²⁹ Finextra, "Bank of America's Erica chatbot wins over customers," March 25, 2019, <https://www.finextra.com/newsarticle/33579/bank-of-americas-erica-chatbot-wins-over-customers#>.

³⁰ Charles Schwab, "Schwab Intelligent Portfolios," <https://intelligent.schwab.com>, accessed September 2019.

³¹ Barclay Hedge, "Majority of Hedge Fund Pros Use AI/Machine Learning in Investment Strategies," July 17, 2018, <https://www.barclayhedge.com/majority-of-hedge-fund-pros-use-ai-machine-learning-in-investment-strategies>.

Conclusion

Capital market firms are creating an infrastructure capable of supporting dynamic transformation initiatives to enhance efficiency and value creation. With the continually evolving regulatory landscape, it is becoming imperative for firms to strategize an action plan for effective compliance.

Incumbents are transforming their legacy systems and infrastructure with the help of emerging technologies such as AI, ML, RPA, blockchain, DLT, etc. Next-generation technology is helping firms fulfill compliance obligations and automate processes to boost operational efficiency.

In this new era, industry participants need to play an equally important role alongside other stakeholders, such as regulators and governments, to formulate standards and best practices across different verticals.

References

1. Consensys, "Advancing Capital Markets with Blockchain Technology," Joseph Lubin, Mally Anderson, Everett Muzzy, Ajit Tripathi, Clark Thompson, Monica Singer, April 2019, <https://pages.consensys.net/advancing-capital-markets-with-blockchain-technology>.
2. UiPath, "The Quickest Ways to Successfully Scale RPA in Banking and Capital Markets: New Use Cases, Heat Maps, and More," Amit Kumar, August 02, 2019, <https://www.uipath.com/blog-expanded-rpa-opportunities-banking-capital-markets>.
3. DerivSource, "ISDA CDM: Will It Transform Derivatives Processing?," Julia Schieffer, January 22, 2019, <https://derivsource.com/2019/01/22/isda-cdm-will-it-transform-derivatives-processing/>.
4. Morgan Stanley, "Quantamental investing: The future is now," Andrew Slimmon, Leslie Delany, May 2018, <https://www.morganstanley.com/im/publication/insights/investment-insights-ii-quantamentalinvesting-us.pdf>.
5. Bloomberg, "The success of quantamental investing is rooted in process," May 08, 2018, <https://www.bloomberg.com/professional/blog/success-quantamental-investing-rooted-process/>.
6. MarketsMedia, "ING Brings AI to Bond Trading," Shanny Basar, October 26, 2018, <https://www.marketsmedia.com/ing-bank-provides-buy-side-with-ai-for-bond-trading/>.
7. Integreon, "Three Steps to Prepare Your Contracts for a LIBOR Transition," Navin Mahavijayan, Patrick Won, June 07, 2019, <https://www.integreon.com/news-insights/insights-three-steps-to-prepare-your-contracts-for-a-libor-transition>.
8. Deutsche Bank, "Are you ready to leave Libor?," August 2019, <https://cib.db.com/insights-and-initiatives/flow/are-you-ready-to-leave-libor.htm>.
9. Medium, "Use of Artificial Intelligence and Machine Learning in Financial Services," Swathi Young, January 10, 2019, <https://medium.com/datadriveninvestor/use-of-artificial-intelligence-and-machine-learning-in-financial-services-fc8474e208d8>.
10. Medium, "5 Advantages of Security Tokens," Stefan Perlebach, February 15, 2019, <https://medium.com/stocheck/5-advantages-of-security-tokens-7b4a66ec3493>.

Disclaimer

The information contained herein is general in nature and is not intended, and should not be construed, as professional advice or opinion provided to the user. Furthermore, the information contained herein is not legal advice; Capgemini is not a law firm, and we recommend that users seeking legal advice consult with a lawyer. This document does not purport to be a complete statement of the approaches or steps, which may vary accordingly to individual factors and circumstances, necessary for a business to accomplish any particular business, legal, or regulatory goal. This document is provided for informational purposes only; it is meant solely to provide helpful information to the user. This document is not a recommendation of any particular approach and should not be relied upon to address or solve any particular matter. The text of this document was originally written in English. Translation to languages other than English is provided as a convenience to our users. Capgemini disclaims any responsibility for translation inaccuracies. The information provided herein is on an 'as-is' basis. Capgemini disclaims any and all representations and warranties of any kind concerning any information provided in this report and will not be liable for any direct, indirect, special, incidental, consequential loss or loss of profits arising in any way from the information contained herein.

About the Authors

Ayush Poddar is a senior consultant with the Market Intelligence Group at Capgemini Financial Services. He has more than five years of experience in consulting and strategic analysis, with a core focus on banking and financial services.

Susovan Dwivedy is a senior consultant with the Market Intelligence Group at Capgemini Financial Services. He has more than two years of experience in IT, consulting, and strategic analysis.

The authors would like to thank the SMEs listed below for their contributions to this paper:

- **Ferreol De Naurois**, Vice President, Financial Services
- **Savita Koppikar**, Senior Director
- **Peter Katsos**, Director
- **Neel Pawar**, Portfolio Manager
- **Jiger Chhadva**, Senior Manager
- **Neeraj A Joshi**, Manager
- **Kalpesh Kothari**, Portfolio Manager, Market Intelligence Group
- **Chirag Thakral**, Director, Market Intelligence Group
- **Elias Ghanem**, Vice President, Global Head of Market Intelligence Group
- **Tamara Berry**, Editor, Content Manager, Market Intelligence Group
- **Kalidas Chitambar**, Director, Creative Services
- **Suresh Kumar Chedarada**, Senior Consultant, Creative Services
- **Sourav Mookherjee**, Manager, Creative Services
- **Dinesh Dhandapani Dhesigan**, Consultant, Market Intelligence Group





About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms.

Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.

Visit us at

www.capgemini.com

Learn more about us at:

www.capgemini.com/banking or
email: capitalmarkets@capgemini.com



People matter, results count.