

FUTURE OF FINTECH IN CAPITAL MARKETS

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This paper has been produced by Deutsche Börse AG's ("Deutsche Börse") corporate venture arm, DB1 Ventures, in partnership with Celent, a division of Oliver Wyman.

As one of the world's leading financial market infrastructure organisations Deutsche Börse provides investors, financial institutions, and companies access to global capital markets. Deutsche Börse covers the entire securities value chain from trading, clearing, settlement, and custody through the provision of derived indices, market data, and analytics as well as technology for development and operation of electronic trading systems. Deutsche Börse, based in Frankfurt, the financial capital of continental Europe, can not only trace its history back to the late 16th century, but likewise, having established one of the first electronic trading systems globally, can claim to have deep roots in the financial technology landscape.

DB1 Ventures has been established as the corporate venture capital platform (CVC) for the Deutsche Börse, with the mission to fund investments in ventures strategic to the organisation, across a broad swath of global fintech firms. DB1 Ventures provides not only capital, but also expertise, guidance, and connectivity to its portfolio companies.

Celent is a leading financial technology research and advisory firm. Its thought-provoking content on the intersection of technology and banking/insurance/securities & investments has been guiding its diverse, global clients through the maze of financial technology disruptions for the past 15 years. Celent advises its client base about change that financial technology firms, in concert with incumbent firms, can create across the financial services verticals in which they operate.

Fintech has proved to be one of the key drivers of transformation of the banking industry, through pioneering business models, proximity to the end customer, and innovative technology. Now fintech firms, in conjunction with incumbent infrastructure players, are imagining a new capital market modeled on a collaborative approach to capital provision, technology, regulation, work-flow processes and connectivity.

This report highlights the power of future collaboration between leading financial infrastructure players and fintech firms.

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FOREWORD

THE EVOLVING ROLE OF THE EXCHANGE IN THE CAPITAL MARKETS

The bank has traditionally sat in the center of the broader financial world. The changing regulatory environment and the explosion of data have allowed fintech firms to capture market share in traditional banking endeavours such as payments, lending, investments, and financial planning. Firms with no asset base or legacy banking infrastructure have made significant inroads into challenging banks in their core businesses. Banks have reacted in a variety of ways to these challenges with disparate degrees of success, but only those actively partnering with and supporting fintech innovators have gained a competitive edge.

Similarly, exchanges have stood at the centre of trading for much of human history. The global collective consciousness still considers exchanges as a place of bustling activity, with people running to and fro trying to execute orders at the best price. The imagery lingers, but the marketplace of today and tomorrow is a center of technology, as much as it is a center of risk transfer and trading. As it has happened with banks, those market infrastructure providers that decide to embrace, leverage and coexist with upcoming fintech firms will be able to further their historical strengths and stay at the core of financial markets.

“The future exchange and market infrastructure organisation will have a larger responsibility in fostering growth and innovation throughout financial markets. Technology is at the core of our business, so partnering with fintech firms with innovative technology and business models which are relevant for our clients is an absolute priority for us. Financial markets are ripe for transformation and we intend to have a leading role in these times of change.”

— Carsten Kengeter, CEO, DEUTSCHE BÖRSE

Market operators are transforming from centers of single asset trading to multi-asset global venues, investing in businesses outside their core trading, clearing and settlement areas to meet their clients changing business needs.

Fintech is a term used to describe how a new generation of cloud and mobile technologies impact processes in financial services. Fintech is closely related to open service architectures using application programming interfaces (APIs) along with business models found in the internet economy. In the first phase, fintech was seen as a disrupter for large established financial companies. Now that these companies as well as regulators are responding to raise the level of customer protection, we are at the cusp of a next wave, where the financial incumbents become platforms- hosting and interoperating with newer, smaller players. Without a doubt, the financial industry will change its technology model, and will foster the integration of services, as long as the customer protection is maintained.

Deutsche Börse is one of the leading platforms, providing a suite of services along the supply chain. As Deutsche Börse moves much of the software stack to the cloud, creating more service APIs, it will become an even more integral part of its customers' workflow. Ultimately, Deutsche Börse will process and clear the bulk of transactions associated with its core business from both today's established players and new fintech companies.

Technology has been a source of structural change for exchanges. In recent years, the pace of change has dramatically increased as a confluence of regulatory, capital, and business model factors has disrupted the financial market ecosystem. Deutsche Börse, thanks to its diversified business footprint and comprehensive coverage of the securities value chain, is well positioned to leverage from fintech investments and partnerships to bring cost efficiencies, better solutions, and new monetization opportunities to its client base. With more touch points for application than any other organisation in the industry, Deutsche Börse can raise its competencies to an even higher level. Today's financial market infrastructure organisation is a client solutions and data-driven technology company that also offers trading, listing, operational and technology services. There are material new business opportunities available to financial market infrastructure firms as they step up to add value added services to the capital market ecosystem.

This note looks at the value accretion that can be achieved through partnerships between fintech firms and market infrastructure players, in terms of connectivity, distribution, technical, and regulatory expertise across areas that are core to the future of a well-functioning financial system.

EXECUTIVE SUMMARY

Since 2008, capital flow into fintech investments has grown sixfold. Last year, about \$19 billion in capital was invested in fintech across approximately 1,200 deals, nearly doubling funding flows in 2014.¹ At the same time, strategic firms have developed innovation centers of excellence, laboratories, and their own CVC funding vehicles to invest and guide in areas of core interest to these firms. CVCs now represent 25% of global fintech capital flows. European CVC rates are closer to 15% and expected to rise. We have seen banks partnering with fintech, filling gaps and bringing critical experience and enterprise scale to these endeavours. Major parts of the financial services ecosystem run the risk of being transformed by pioneering financial technology firms.

The changes in the ability of firms to access capital in the post-crisis world, combined with a global regulatory model that has focused on risk mitigation and deleveraging, has put significant pressure on incumbents' margins and negotiation power, creating a generational shift in the relationship between the sell side, buy side, and infrastructure firms.

A FORMULA FOR SUCCESSFUL PARTNERSHIPS

Incumbents offer expertise, connectivity, infrastructure, scale, and regulatory licensing and know-how. Fintech firms bring innovative business models, deployed through state of the art tools and technology stacks. Not only does the ability of the fintechs to leverage cloud-based technology increase, their go to market speed increases and capital requirements drop, but new APIs allow them to collaborate more easily with both incumbents and clients.

INCUMBENTS MARKET CENTERS

Scale

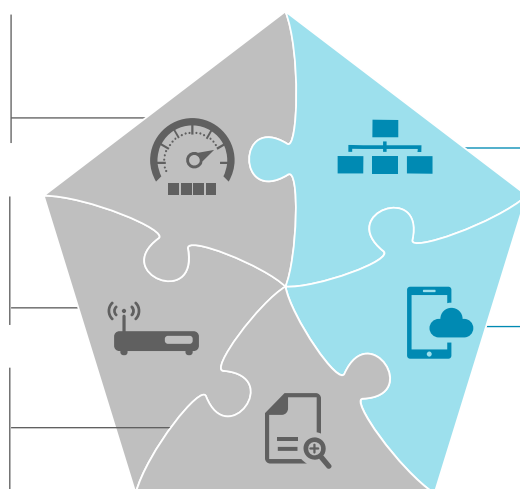
- Access to capital
- Distribution
- Trusted intermediary

Infrastructure

- Technology
- Existing connectivity
- Data access

Expertise

- Market structure
- Regulation
- Compliance



FINTECH

Business model

- Innovative approaches
- New models for access

Technology

- Alternative technology model
- Lean cloud or as-a-service offering

¹ All investment capital flow from CB Insights, Venture Scanner, Preqin Ltd., Celent analysis

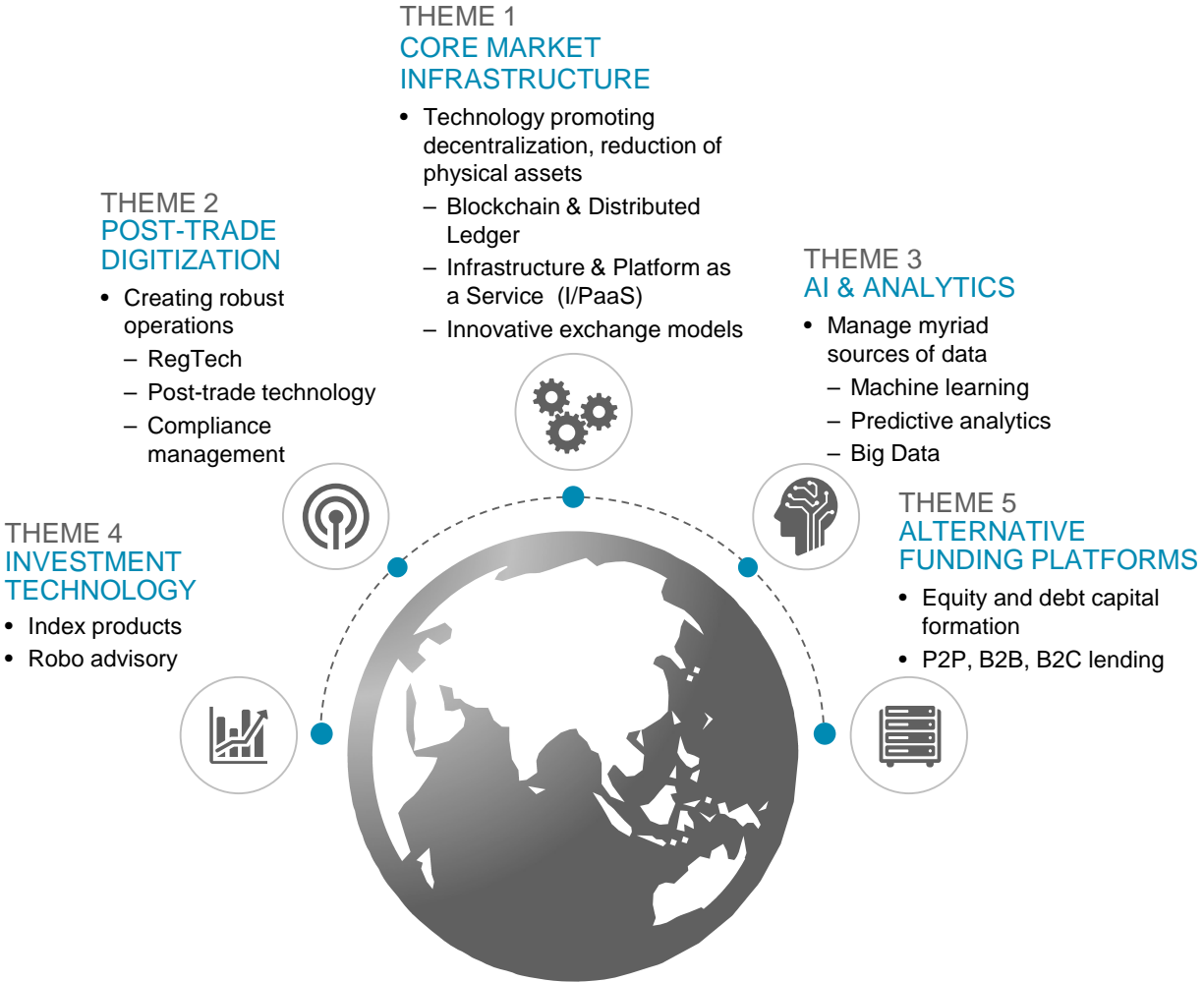
Financial innovators are looking to drive efficiencies and increase proximity with direct and indirect customers across all financial verticals. Fintechs increasingly have the flexibility, customer proximity, and technology understanding necessary to address business challenges across the entire value chain of capital markets. Solutions that address critical points around market infrastructure (including associated software and cloud-deployment solutions), post-trade processes, and access to capital are among the priority clusters where DB1 Ventures will actively source for investment and partnership opportunities.

- **Core Market Infrastructure:** Creating safer and more transparent access to liquidity; developing efficient and intelligent platforms for trading and clearing; creating/expanding new asset classes; leveraging new technologies in the cloud and API interactivity in order to seamlessly manage market infrastructure or connectivity as a service.
- **Post-Trade Digitization:** Automating the heavily manual processes that still exist within the compliance, regulatory, collateral management, and securities lending; increasing capital efficiencies, clearing and settlement businesses; and launching innovative solutions to manage enterprisewide stress testing, risk attribution, and reporting processes.
- **AI & Analytics:** Developing solutions that utilize in-memory computing and machine learning to leverage the massive swell of structured and unstructured data to make predictions, and build analytics at the point of trade.

Similarly, innovation is changing the way investment and funding is provided and consumed:

- **Investment Technology Digitization:** Software and tools that enhance investment decision-making, as well as contribute to accelerate the shift towards passive investments.
- **Alternative Funding Platforms:** Platforms that allow alternative models for capital formation across the capital structure of both large institutions and SMEs.

CAPITAL MARKET FINTECH CLUSTERS





THEME 1

CORE MARKET INFRASTRUCTURE

The backbone of the capital markets is the infrastructure that connects asset holders and their intermediaries. This infrastructure is undergoing a transformation to drive greater transparency and efficiency.

The reaction to the financial crisis has been an improved but still fragmented global regulatory environment, with an underlying theme of systemic stability and transparency, which has created a renewed interest in new models for market engagement and access to products. Furthermore, contraction in the banking sector has placed the sourcing of and search for liquidity with a wider group of players.

The retrenchment in traditional dealer balance sheets, tied with endemic cost-cutting programs, is creating a favorable environment for new players with lower regulatory burdens to come in and work towards solving some of the industry's most difficult problems. For instance, Oliver Wyman estimates that the unsecured repo market shrunk 50% between 2010 and 2015, triggering bank and infrastructure player investment in blockchain startups working to create new models for repo liquidity.

The traditional broker-dealer and client relationship has been turned upside down in the post-crisis world. Strict requirements for capital and risk weighted assets (RWAs) have continued to drive down bank RoEs, which have recently been below the cost of capital. The implications are new market structures and new models for transferring risk.

While the sell side is smaller today, the buy side has grown dramatically since the crisis. Buy side firms want to access liquidity in the most effective way possible, while maximizing best execution and minimizing capital costs. The largest asset managers want alternative models for execution and clearing that obviate the traditional reliance on broker-dealers.

Broker-dealer revenue has decreased with a CAGR of –2.4% since before the financial crisis, while the buy side has grown assets from US\$50 trillion to US\$80 trillion in 2015, and grown revenue with CAGR of +4.3%.

Market participants continue to demand more electronic trading across asset classes. Celent has seen the adoption of electronic trading move with increasing rapidity as more and more asset classes become available through virtualized trading environments. The global fragmentation of liquidity in equity, FX, fixed income, energy, and commodities across both cash and derivatives increases demand for concentration of disparate market centers (highlighting the benefits of potential exchange consolidations).

Clients in these markets want tools and services to aggregate liquidity from all available sources as well as flexible market structure models in order to ensure best execution. Clients also want greater access to data for analysis as well as speed of connectivity to each new, innovative trading venue that has the potential to lower total cost of ownership.

In FX, global platforms have been created, bringing multiple products, access, and liquidity under a single roof. Exchanges have acquired FX trading platforms in recent months as a way to diversify the business footprint and add new asset classes to their integrated value chains. The acquisition of 360T, the largest fintech startup in Germany, served as the best recent validation of the potential of fintech in capital markets. The combination with Deutsche Börse will make it a leader for listed and OTC FX trading and clearing.

Electronic trading venues are focussing their resources on market microstructure and product innovation. Reduction of TCO and the need for speed are fostering outsourcing of operations and infrastructure in order to allow focusing on core competency. Connecting clients to liquidity and other venues is driving the need for connection in the fastest and cheapest fashion available.

THE ROLE OF DISTRIBUTED LEDGER TECHNOLOGY IN LESS COMPLEX AND MORE SECURE FINANCIAL MARKETS

One topic that is currently being given a great deal of attention is blockchain or distributed ledger technology (DLT). In the current discussion, blockchain is treated as one of the most disruptive technologies available at present and in the near future. It is marketed as a technology that would be able to simplify the value chains around trading, payment, and market infrastructures in general. Due to its decentralized character, blockchain enables direct peer-to-peer interactions and thus removes complexity of value chains through disintermediation of existing players.

WHAT IS BLOCKCHAIN?

The short answer: It is the technology behind Bitcoin. This answer, however, is too superficial. While Bitcoin is the grandfather of blockchain and certainly the most prominent example of a blockchain application, the technology has emerged to be much broader. **Blockchain is a network of distributed databases** where the complete content of the database is replicated across the whole network. The consistency of the updates is ensured through consensus algorithms that not only prevent faults in replication through technical malfunction, but also prevent malicious attacks from users of the network and outside intruders. Secure copies of the data are replicated across network nodes and ensured through cryptography. Depending on the design of the blockchain, transactions are signed cryptographically using state-of-the-art public/private key encryption. These digital signatures prevent fraud and thus allow the distribution of a *shared encrypted truth*. Technically blockchain is a *write-once* database. This feature plus the distributed character assures that data stored in a blockchain cannot be forged, altered, censored, or deleted without the other participants noticing. As with traditional databases, blockchain allows for the possibility to embed logic in the database — this feature is typically called *smart contracts*.

Proof of concepts and/or prototypes have been reported for use cases around post-trading: i. e., settlement systems and payments (e. g., cross-border payments, trading and handling of less liquid financial instruments such as single name CDS, issuance of private securities).

Currently, the barriers in adoption of blockchain technology fall broadly under two categories:





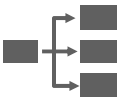
a) technology and b) regulation,

- a) The technology is not yet mature enough to replace current core production systems of financial services firms or market infrastructure providers. The technology looks promising but it is faced with constraints such as a lack of scalability and the potential for conflict between transparency and the confidentiality of information.
- b) The regulation of blockchain technology is at the moment unclear, but it will be important to ensure stability and integrity. Regulators are currently evaluating this new technology, and Deutsche Börse Group is in direct dialog with them to gain important experience and to be informed about any developments.

Despite these barriers, capital flows into blockchain technologies surged in 2015, with nearly a half billion dollars allocated directly into blockchain infrastructure technology, with the lion's share coming from strategic investors and CVCs. Financial market infrastructure organisations are leading the investment into DLT firms to create new underlying infrastructures and market models for the creation, issuance, and distribution of private securities, democratizing both processes and access. Deutsche Börse has been at the forefront of this activity, with its recent investment in Digital Asset Holdings and its participation in the HyperLedger project.

THE KEY COMPONENTS OF A DISTRIBUTED LEDGER AND THE IMPLICATIONS

BLOCKCHAIN – THE FIVE KEY PARTS

COMMON DATABASE		Tokenisation of assets/ contracts	<ul style="list-style-type: none"> • Underlying assets are uniquely identified • Form a database with ownership rights assigned • Disruption: Custodians and banking
		Universal ledger	<ul style="list-style-type: none"> • Creates a universal record of ownership and transactions • Updated in realtime with automatic reconciliation • Disruption: Removes reconciliations from finance
AUTO- EXECUTION		Self-enforcing smart contracts	<ul style="list-style-type: none"> • Automatic settlement of financial obligations between counterparties • Convert terms of a transaction into “financial code” • Disruption: Removes financial intermediaries in post trade
		Cryptography and update by consensus	<ul style="list-style-type: none"> • Cryptographically enforced database • Decentralized nature of the database maintains confidentiality • Disruption: No central point of failure
DISTRIBUTED ARCHITECTURE		Distribution of ledger	<ul style="list-style-type: none"> • Participants mutually agree updates to the database • All work off a local copy without connectivity to a central source • Disruption: Removes multiple reconciliations and enhances P2P

The potential implications of DLT on core market infrastructure are far-reaching for the capital markets, offering a path to a more efficient market infrastructure. Changing models in technologies directly impact market operators like Deutsche Börse, changing the nature of issuance, and potentially enhancing the exchange's role in price discovery, creating a network of firms, accessing liquidity, diminishing frictional costs by mitigating capital usage, and speeding settlement.

Consistent with the increased focus on DLT, innovative IT stacks that utilise cloud-based technology and API connectivity into incumbents are increasingly driving the development of more agile software solutions for market infrastructure and banking. However, data security and encryption, which are defining imperatives for new technology solutions within financial services, are critical and without them fintech firms will most likely fail to meet the rigorous industry requirements.



THEME 2

POST-TRADE DIGITIZATION

Post-trade operations need to be optimized to maximize capital efficiency and mitigate operational risk.

The systems and environment supporting European post-trade operations are highly fragmented, but both regulators and financial players are starting to mobilize towards the achievement of centralized infrastructures and solutions for the management of post-trade workflows. As an example, T2S is revolutionising the European post-trade landscape by creating a single settlement environment that should bring domestic market efficiency to the international securities settlement domain. The vision is to build a borderless pan-European infrastructure for real-time securities settlement in central bank money.

Initiatives like T2S were conceived to delocalize and increase process efficiency, but there is still a long way to go for a part of the industry that traditionally underinvested in technological upgrades. Firms relying on manual processes are finding themselves increasingly open to solutions to optimise and automate post-trade processes that were previously deemed as too sensitive to operational risk arising from change. Today financial market infrastructure providers are focused on solving problems for clients by delivering, for example, solutions to optimize the use of collateral and by delivering capital efficiencies to clients. Funding and financing is another area where the market can continue to be supported with new solutions.

Change accelerates in a world where information and capital travel fast. Risk management, compliance, and front office employees require market intelligence and information tools to be able to detect, track, and monitor market developments, therefore, Celent expects global risk management and risk-related regulatory compliance technology spending to hit \$72 billion in 2019, a 10.1% CAGR.

In recent analysis Celent found that 80% of OTC derivative reconciliation was still manual: phone- and Excel based.

As transactional value chains begin to be redesigned and digitized, firms will be forced to execute similar transformations for risk, regulatory, and compliance processes, especially those that are directly linked with transactional workflows.

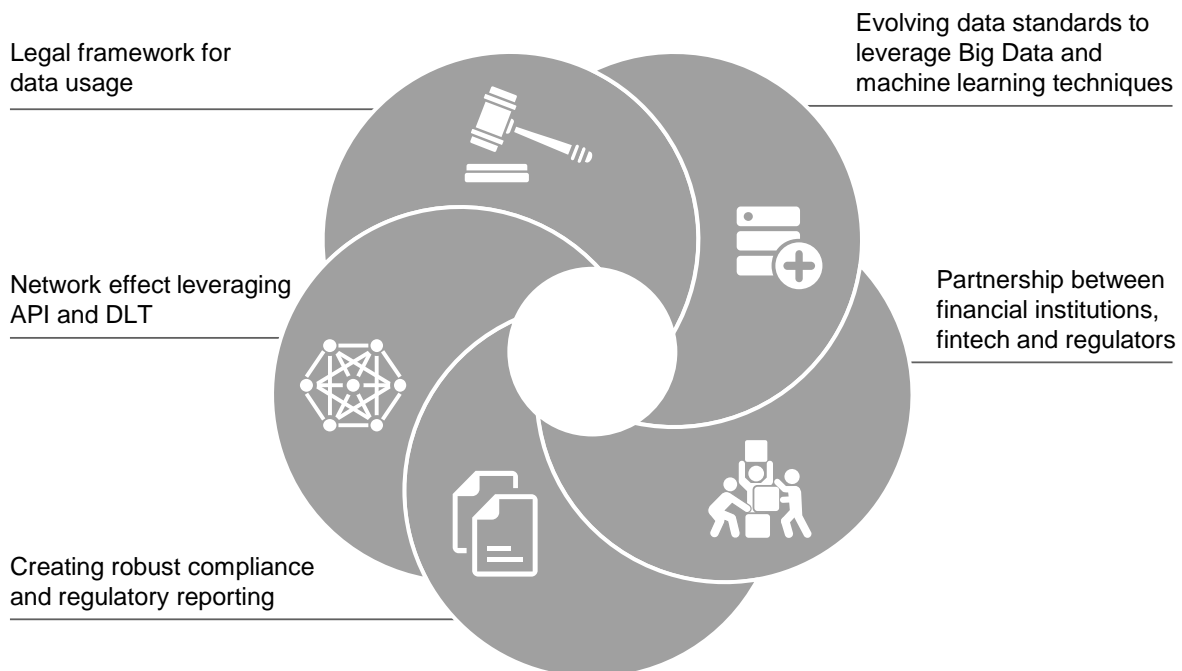
Some of the challenges that innovators are addressing are: non-standardised data such as company reports, PDFs, emails, and a variety of regulatory data formats; silos that diminish effectiveness such as disparate and fragmented internal systems, as is the case with the multitude of internal systems from internal trading systems, across asset classes, as well as myriad internal finance and accounting systems; and complexities in data interchange, as evident in the interaction between counterparties, CCPs, and regulators.

REGTECH AS A WAY TO MONETIZE REGULATORY PRESSURES

Regulators have emphasised better and more transparent reporting. From data management tools to clean and parse internal data, to software as a service solutions that use the latest visualization technologies, fintech is critical in helping firms and institutional investors create the necessary reports for compliance, risk, and regulatory purposes.

THE EVOLUTION OF THE REGULATORY LANDSCAPE AND DEMANDS FOR REPORTING

Firms are looking to Big Data, AI, and advanced analytics to process and prepare robust informational reports.



The global regulatory environment is providing two unique opportunities for RegTech innovators. On the one hand, providing cheaper and more effective regulatory compliance; on the other, providing firms with an opportunity to make regulatory change an opportunity.

Regulatory Technology (RegTech) is a key growth area, with innovative technology and software applied to assist in intelligently managing the regulatory and compliance processes. Market participants are partnering and engaging with regulators via new compliance architectures that highlight a partner-based relationship with custodians, exchanges, and ARMs. For example, the creation of a nodal point on a blockchain to provide real-time and direct access of trade data to regulatory bodies; or, the creation of predictive tools to analyse structured and unstructured data, short interest, regulatory news flow, social media, and market abuse data, will help to create an environment of **regulatory partnership**.

RegTech is an opportunity for incumbents to improve their operational efficiency, reduce systemic risk, and provide additional revenue-generating opportunities. Market infrastructure providers like Deutsche Börse are well positioned to offer services in this space because they already hold large pools of necessary data on their systems. This data, in conjunction with value-added services around regulatory reporting, opens windows of growth for market operators to generate additional revenues, as has been the case with Deutsche Börse's venture, RegisTR, or the recently launched regulatory reporting service.



THEME 3

ARTIFICIAL INTELLIGENCE AND ANALYTICS

Processing data to glean intelligence is the defining activity of our age. Firms that can build the analytical architecture to answer today's questions with the embedded flexibility and tools to answer tomorrow's questions will be the leaders of their space.

The explosion of data in capital markets has continued. The data set has also morphed to include not only the traditional pricing data, but semistructured and unstructured data, such as social media, news, and videos. The multifaceted types of data that can now be leveraged present many opportunities, but at the cost of complexities in data curation, distribution, normalization, processing, and storage.

Deutsche Börse processed an average of 1.74 terabytes of data per day in 2015.

Big Data tools and analytics have gone a long way to providing solutions to the preparation and interpretation of data. The accuracy and speed with which market players can accomplish this is more than ever a clear competitive edge. The savviest market participants are those who can leverage the broadest and deepest data sets for the most complete decision-making. Buy side and sell side firms are looking for more detailed analytics, in real time, on market microstructure, broker/client engagement, and statistically based predictive analytics.

Concurrently, the computing power and advanced statistical modelling advancements have made artificial intelligence (AI) a nascent reality across the financial world. Much of the funding for capital markets AI solutions has been deployed at firms with proprietary IP focused on finding patterns and addressing complex problems that traditionally required vast human capacity to solve. CB Insights estimates that between 2010 and 2015 nearly US\$1 billion has been invested into machine learning, cognitive computing, deep learning, predictive APIs, and natural language processing.

AI in the capital market is moving beyond rules-based algos into a generation of bots and machine learning tools that learn to recognize and react to patterns within the data. This might be predictive analytics in the search for alpha, or pattern recognition to mitigate false positives in AML or KYC.

Simultaneously, better text mining tools, rapid increases in in-memory analytics, and the rise of predictive models based on statistical, neural, and other algorithms, are coming of age to provide a new trove of information. Machine learning will be central in driving the industry towards a shift from post-trade and history-based analytics to pre-trade predictive analytics.

While much of the talk has been centered on predictive analytics at the front office, Big Data technologies are having an impact in driving efficiencies in post-trade activities like reporting, compliance, and risk management.

Tools such as Natural Language Generation (NLG) that write research or business reports, for example, could start to make subjective or creative recommendations instead of just writing text based on structured and unstructured data analysis. On the operational side, RegTech firms are utilizing huge data sets for recognizing risk patterns, predictive compliance, predictive risk, and detecting anomalies.

Artificial intelligence and advanced analytics will impact capital markets, providing essential tools to mine data across the value chain. Based on recent conversations with capital market CTOs, Celent sees AI and machine learning mentioned as the number one technology on their radar screen.

At its core, a financial market infrastructure organization is also a data company. New methods of data delivery and tools for insight and prediction will serve issuing companies, trading firms, clearing houses, and central depositories to make better decisions around capital allocation and risk. Better data insights will provide investors with a next generation of index products, ETFs, and other innovative trading and investment products. Big Data has given us a means of processing new data sets and artificial intelligence is giving us the tools to predict and monetize the insights.



THEME 4

INVESTMENT TECHNOLOGY DIGITIZATION

Investment technology firms are offering investment managers of all sizes tools for monitoring markets and allowing better decisions based on robust data analysis.

Asset managers and their clients want real intelligence and insight around their investment and the sources of its performance. Whether it is quantitative investment decision tools or passive investment products that mirror active management approaches, a next wave of innovation is seeking to change the traditional asset and wealth management businesses. Demand, performance, and regulation continue to drive assets into indexed and passive products. Passive index-based asset managers are now among the largest in the world. Passive investing is on its way to represent a third of global assets under management in the next four years. New products like smart beta are blurring the traditional lines between passive and active, and look to accelerate the shift in how assets are managed.

In the past two decades, passive index products under management have risen from \$55 billion to \$4 trillion: a twenty year CAGR of almost 24%.

Investment technology is changing the dynamics of the asset management business, as investment products like ETFs expand both globally and into more innovative structures. ETF growth continues upward, surpassing \$2 trillion in assets in 2015 from under \$1 trillion in 2010. This creates more demand for tools that optimize asset allocation, quant-based investment, and more direct engagement with liquidity by ETF creators. It also allows producers of market data, like exchanges, to create new IP and products aside from traditional benchmarks and indices. The shift towards a technology-driven means of investing has created a situation where brokerages have moved upmarket. RIAs are expected to do the same or be forced to find some sort of accommodation with the automated investment advisors. Large incumbents such as broker custodians, meanwhile, are leveraging economies of scale to roll out low-cost or even zero-cost portfolio management platforms or partner with robo advisors. Bank brokers, are already working with or building scalable, low-cost platforms to address the needs of their less affluent clientele.

On the institutional side, investment technology has gained relevance as we continue to shift towards automation in asset allocation and rebalancing, as well as new deployment mechanisms for the allocation of capital in alternative investments.

On the retail side, the shift of client preferences towards cloud-based user-friendly solutions is fuelling the rise of the so-called robo advisory investment platforms. This has an impact upstream as issuers and distributors focus on products that can easily be scaled on platforms such as robo advisory.

Automated investment management is often defined as portfolio construction by algorithm. This definition, while eye-catching, focuses on execution at the expense of a broader and ultimately more significant transformation: the automation of front end business processes (including rebalancing, monitoring, performance measurement, and reporting) that formerly required human intervention.

While the dawn of active management could have an impact on trading volumes for exchanges, the rise of passive investments generates monetization opportunities for firms with the technology infrastructure and data necessary for the construction of innovative indices, as well as the provision of investment decision tools.



THEME 5

ALTERNATIVE FUNDING PLATFORMS

Alternative funding platforms are reshaping traditional channels for equity and debt capital formation. Similarly, peer-to-peer (P2P), business-to-business (B2B) and business-to-consumer (B2C) lending is opening up new networks for accessing capital.

Alternative funding platforms and peer-to-peer (P2P) business models are reshaping traditional relationships by filling some of the funding gaps created after the financial crisis of the last decade. Both from the perspective of a retail client or small business facing challenges to raise working capital, as well as that of an institution willing to syndicate risks or an investor looking forward to allocate capital in illiquid assets, the evolution of crowdsourced loans and investments has opened a new myriad of possibilities.

What started with a network for individuals getting car loans from an online loan portal and making equity investments via a crowdfunding site is increasingly institutionalizing. A new ecosystem for direct issuance of private shares, access to debt financing, and FX trading is emerging.

Alternative funding platforms that provide capital and liquidity for corporates that traditionally have only relied on banking relationships, have put significant pressure on financial institutions to adapt their business models and gain proximity to the customer. Now lenders and borrowers are able to connect directly through online platforms bypassing all types of intermediaries that are unable to justify their fees. This space has attracted considerable venture investment, garnering over 40% of VC capital in 2015, fuelled by the multi-trillion size of the addressable markets, the acceptance by millennials of the P2P model, and some of the largest bank/fintech partnerships. Recent developments centered on credit policies and KYC-related topics are, however, also leading to an increase of interest from regulators around the world on what traditionally have been lightly regulated business models.

In Europe, it has specially been the case that consumers and SMEs have traditionally relied solely on banks for financing. Alternative funding platforms are permeating through the ecosystem, though they are still in their early days, to create a lasting and viable business model for consumers and small and

midsize enterprises (SMEs) looking for financing, as well as for investors looking for exposure to higher yielding opportunities.

The securitization market in Europe has been slowly recovering. New models for alternative online platforms will create an opportunity for established incumbents to partner with fintech firms to create a new market for securitized products.

To improve capital markets systems, European governments have supported the use of alternative financing methods to stimulate and direct investment to their people and businesses. In tandem, private enterprise has taken it upon itself to develop the mechanisms capable of connecting a diversity of investors/lenders and borrowers with a wide range of financing needs. Through these combined efforts, crowdfunding has emerged as a viable form of alternative financing for many startups and individual investors. Nonetheless, as the space becomes increasingly institutional, it is increasingly capturing the eye of regulators in the US and Europe. A merger of alternative funding platforms with firms with strong regulatory relations looks to be the future.

There is a movement globally today by exchanges to ease access to private capital by bringing together capital providers, with new alternative funding technology to create a new network for the underserved SME.

New platforms offer a path for SMEs to directly access a network of private capital ranging from retail to HNW. Similarly to the role they play in securities markets, organisations like Deutsche Börse, which stand in the center of publicly traded markets with neutrality, have taken the lead in utilizing technology and market connectivity for SMEs and private enterprises to gain access to liquidity and capital.

There is nothing precluding large market infrastructure providers from leveraging their market operation expertise in financial and large corporate domains, in order to act as the point of encounter between idle capital in hands of private investors and cash-rich corporations, and the need for growth capital from small businesses across the world. This is a trend for financial market infrastructure organizations to capitalize on for many years, providing new solutions to the market in the realm of funding and financing.

CONCLUSION

Fintech disruption will continue across the financial market value chain. In 2003 less than 1% of global investment capital was in fintech, while in 2015 it made up over 8% of the capital pool. Market participants will react in a variety of ways to create a new vision for the capital markets of tomorrow. The forces of regulation, market structure change, and repositioning of capital market participants will continue for the next decade.

Trends in digitization will accelerate, and the challenge for established technology firms and market operators will be to find the correct means of collaborating with new business models and innovative technologies. Concurrently, partnerships are growing and the fintechs are attracting more and more talent from the broker-dealer and investment banking world to work to create new models for the next wave of innovation.

The financial market infrastructure provider of tomorrow will have leveraged its leadership in regulation, market structure, trading, clearing, and settlement to guide startup fintech firms in the journey towards creating an effective and safe capital market for the twenty-first century and beyond.

Market participants need to continually evolve and innovate their business models. Deutsche Börse today is more than ever focused on solving problems for clients, from providing solutions to optimise use of collateral and enabling clients to fulfil regulatory requirements to introducing and scaling new asset classes like FX and commodities to foster further efficiencies. The need for access to funding and financing is another area where the organisation is already supporting the market with new solutions.

Fintechs can help incumbents to transition to new business models and access additional growth pockets. Deutsche Börse is extremely well positioned from a capital, regulatory, technology, and operational perspective to invest and partner in fintech, aiming to shape a next-generation organization that ensures a robust capital market infrastructure for the benefit of its clients.



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