RESEARCH REPORT

February 26, 2018

FinTech Update

Disruption at Every Layer

Financial Technology (FinTech) has affected the fundamental ways in which many people think about the financial services industry. From online and mobile banking to online brokerages, FinTech has made financial services more user friendly, easier to access, and more affordable. This deeply affects the way traditional banks do business moving forward, putting pressure on these incumbents to adapt to the changing landscape. With increasing transparency due to the Internet and online services, banks are facing greater competition not only among themselves, but also against FinTech companies, startups, and even technology companies. The development of FinTech is an important trend that needs to be monitored as it changes supply chains, consumer attitudes and behaviours, and company strategies.

The three main areas in which FinTech is rapidly developing inlcude:

1. Insurance and InsurTech
2. Capital Markets Tech
3. Robo-Advisory

FinTech has a nearly 70 year long history of changing the way people interact with the financial industry. It is expected that FinTech will have a huge impact on the FIG portfolio as it puts pressures on bank margins, increases the stakes of user experience, and influences the ways other companies interact with financial institutions. Thus, it is worth taking a deeper look at the potential impacts of technology as we enter 2018.

Financial Institutions

Neil Shah
nshah@quiconline.com

Adam Carnicelli
acarnicelli@quiconline.com

Irena Petkovic
ipetkovic@quiconline.com

Liat Fainman-Adelman
lfainman@quiconline.com

Linna Li
lli@quiconline.com

Bronwyn Ferris
bferris@quiconline.com

Table of Contents

Introduction to FinTech

What is FinTech?

FinTech, short for Financial Technology, refers to firms or companies that offer financial services through technology-based means. FinTech companies are also often thought of as disruptors because they provide financial products and services that were thought of as traditional bank and financial institution offerings. For example, online brokerages and alternative payment systems allow people to bypass traditional firms to manage their capital, which also reduces the fees paid. In this way, FinTech also looks to increase affordability and accessibility of financial services through technology. Essentially, FinTech companies disintermediate the finance industry, reducing the costs associated with providing and accessing financial services. Technology is also used to improve the client experience, with services offered in a much more timely and user-friendly manner.

However, FinTech isn't just the business of disruptors, startups, and technology companies. Traditional banks and firms are also investing in technology to improve their efficiency, customer experience, and product offerings. For example, according to a 2017 PwC report, 30% of large financial institutions are investing in Artificial Intelligence (AI) and 77% are expecting to adopt blockchain by 2020. Many Canadian banks have invested in innovation labs, digital banking services, and AI predictive technology, recognizing the need to adapt to the new technology.

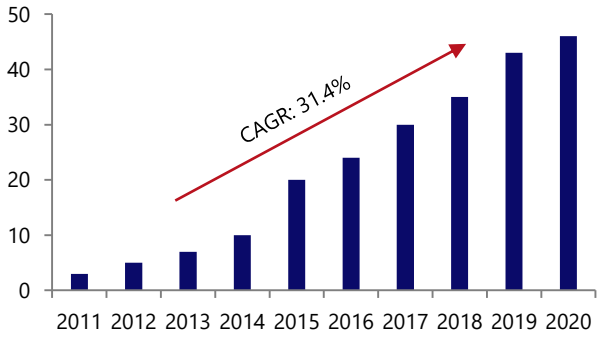
History

The idea of using technology in a financial context is not new and has been evolving over the past 70 years. The emergence of credit cards, ATMs, and electronic stock exchanges were the hallmarks of disruption in the mid-1900's. The beginning of e-commerce and alternative payment systems during the 1990's and its rising dominance today demonstrates how the process of disruption is ongoing and can fundamentally change how many different industries operate. The adoption of the Internet was also a large driver of change because it allowed consumers to compare price, product quality, and user experience in a way that couldn't have been done before. 2008 facilitated the impressive rise of FinTech companies as steady investment from venture capital firms and investment from large tech firms bolstered start-up growth while banks worked on recovery.

In the next five years, the entities that are expected to be most disruptive in the FinTech space are Startups, Social Media and Internet Platforms, large technology companies, and e-retailers.

EXHIBIT I

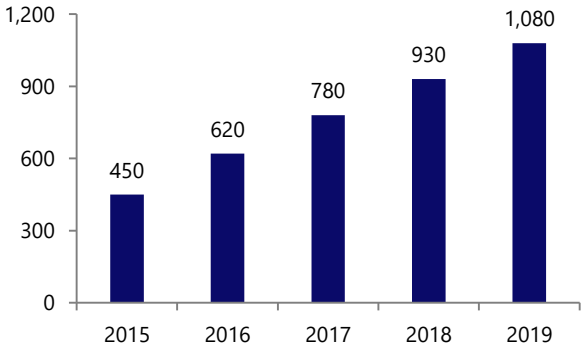
Value of FinTech Investments Worldwide ($B)



Source(s): Deloitte

EXHIBIT II

Total Revenue of Global Mobile Payments ($B)



Source(s): TrendForce

Key Developments in 2018: InsurTech

The Insurance Industry's Status Quo

The insurance industry is often characterized by its lack of efficiency and large number of intermediaries in the supply chain. The industry is highly dependable, with strong barriers to entry, few new entrants, and consistent demand. Strict regulations have further prevented increased competition, thereby reinforcing existing insurance providers' standings within the industry.

An insurance company's business models starts with the client. When an individual requires insurance, such as auto, health, or life, they get assistance from an agent or broker. Both intermediaries facilitate the licensing and distribution process. However, agents represent one or more insurance companies, while brokers represent the customer. Next, a contract is devised. After this, the customer must pay periodic premiums to the insurance provider. The insurer uses this income for three things: to reimburse customer claims, cover company operating expenses, and realize additional income from various investments.

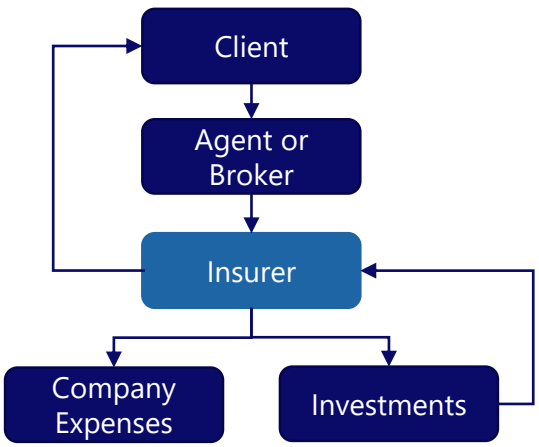
Room for Disruption

The InsurTech market saw a sharp increase in investor interest in 2016, when a slew of startups emerged. InsurTech providers can be segmented into five categories: distribution disruptors, connected world, digital analytics, new breed solutions, and claims ecosystems.

Distribution disruptors look to eliminate intermediaries, by automating their tasks. The connected world provides insurance solutions for the on-demand economy. For example, the startup Lemonade offers coverage for Airbnb hosts and Uber drivers. Digital analytics companies deliver data-driven insights to insurers. New breed solutions providers are end-to-end products that disrupt the supply chain. The $10B Chinese company ZhongAn illustrates this by offering e-commerce, mobile payment, and financing guarantees for internet businesses and users. Finally, the claims ecosystem seeks to expedite claims payments to customers, improving customer service and reducing cycle time.

EXHIBIT III

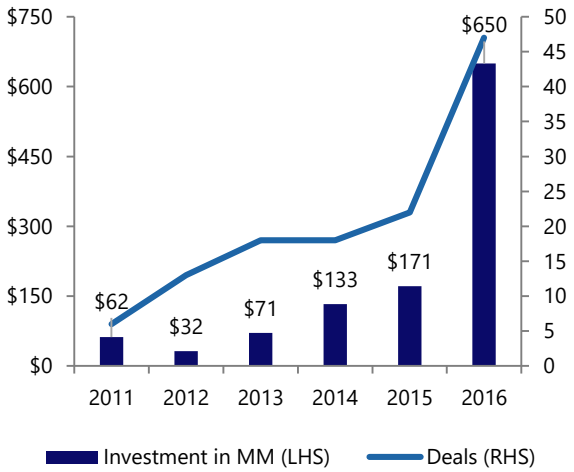
The Flow of Funds in an Insurance Company



Source(s): Investopedia, National Insurance Blog

EXHIBIT IV

InsurTech Historical Global Financing



Source(s): Business Insider

Key Developments in 2018: Capital Markets Tech

Overview

For years, capital markets technology has been an emerging trend, slowly being adopted by incumbents. However, 2016 saw increased traction with a record 216 deals worth approximately $1.9B. These privately-funded players are seeking to leverage technology to automate and digitize tasks in the front, middle, and back office. Finally, industry giants are starting to take notice.

Front-Office

The front-office segment refers to technology disrupting, customer-facing, areas of capital markets businesses, including sales, trading, and research. The products in this category include:

1. Exchange & Trading Platforms: This refers to alternative exchange or trading platforms for institutional investors for asset classes including stocks, bonds, ETFs, FX, and derivatives.

2. Portfolio Management: This encompasses software that supports traders and advisors in streamlining their investment management workflow.

3. Hedge Fund Tech: These companies leverage technology to build platforms for hedge funds and high-frequency traders.

Middle-Office

This encompasses support functions such as investment risk, research, and analytics platforms. This includes:

1. Alternative Data: Firms in this space grant investors access to data and non-traditional data sets that complement or replace legacy data providers.

2. Business Intelligence: This subcategory equips investors with tools to make strategic investment decisions based on key data takeaways.

3. Market Data Platforms: These platforms collect and translate unstructured data sets into insights.

Back-Office

This category targets the administrative tasks associated with the back-office such as clearance and settlement, risk and compliance, and IT. There are four subcategories:

1. AML & KYC Tools: This segment addresses anti-money laundering (AML) requirements, by leveraging Know Your Customer (KYC) controls.

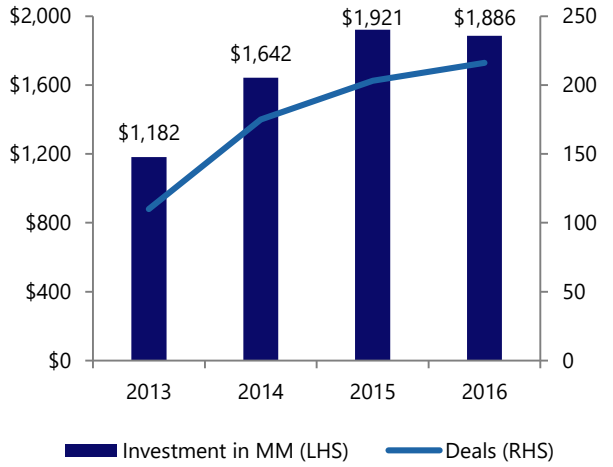
2. Clearance & Settlements: These companies disrupt the existing clearance firms and innovate on the established settlement processes.

3. Monitoring: This software monitors employees, and analyzes customer interactions and actionable anomalies for financial institutions.

4. Risk & Compliance: These firms provide software to identify and mitigate broader risk and assist institutions in meeting regulatory standards.

EXHIBIT V

Capital Markets Tech Historical Global Financing



Source(s): Pitchbook Data

Key Developments in 2018: Robo-Advisory

How It Works

Robo-advisors have been disrupting the wealth management market for some time. They target inexperienced millennial investors by offering a low cost, low effort, and low risk solution. Robo-advisors assess an investor's risk appetite, time horizon, and financial goals and automatically build a diversified portfolio accordingly. As the markets fluctuate, robo-advisors readjust investors' portfolios back to target allocations. Unlike traditional asset managers who charge fees of 2-3%, robo-advisors operate on fees of 0.15-0.5%.

The Evolution of Robo-Advisory

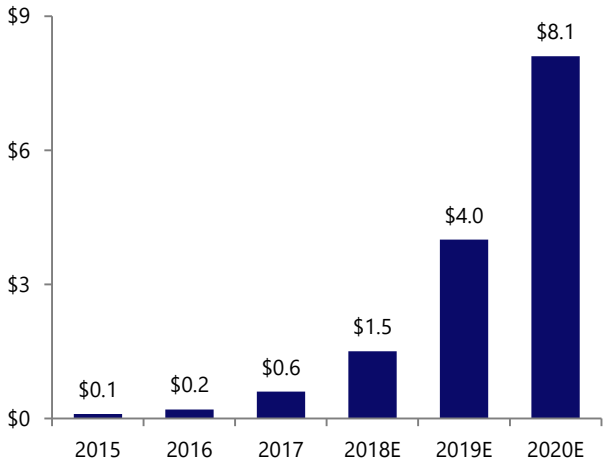
Since inception, this market has evolved significantly through four distinct phases. These refer to:

- Phase 1.0: Clients receive single-product proposals or portfolio allocations based on listed investment products after answering a short questionnaire. There are no banks or broker-APIs managing the trades.
- Phase 2.0: Asset allocations are managed manually by dedicated investment managers. Questionnaires are not only used to filters suitable products but to assign clients to pre-defined risk-allocated portfolios.
- Phase 3.0: Investment decisions and portfolio rebalancing are based on algorithms which monitor and satisfy pre-defined investment strategies. Final oversight is provided by professional fund managers.
- Phase 4.0: Sophisticated risk management and customer profiling to enable direct investment through self-learning A.I. investment algorithms.

Approximately 80% of robo-advisors in the U.S., Canada, U.K., and Germany fall within the Phase 3.0 segment with an increasing focus on automation. That said, the hybrid robo-advisor model still remains the most popular where investment managers utilize digital services for portfolio management to optimize the quality of their advisory services.

EXHIBIT VI

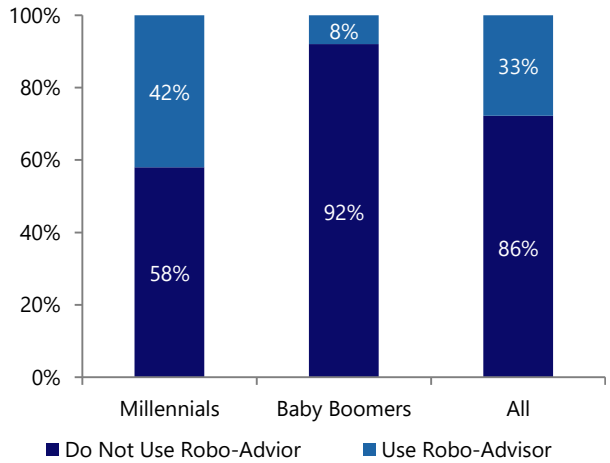
Global AUM Robo-Advisors Forecast ($T)



Source(s): BI Intelligence

EXHIBIT VII

Robo-Advisory Usage by Generation



Source(s): ThinkAdvisor

Recent Developments of Canadian Bank Holdings

TD Bank's Tech Investment

In the past two years, TD has invested in a number of FinTech oriented initiatives. As with most asset management-related services offered today, TD offers passively managed ETF portfolios in both Canada and the U.S. as well as robo-advisory Essential Portfolios to its clients in the U.S. Furthermore, TD is the only Canadian bank to partner with Plug and Play, a Silicon Valley FinTech accelerator that connects startups with companies and investors. In 2017, TD announced a funding program for FinTechs and startups that will help these ventures secure intellectual property rights. The program will also help with patent applications. TD has set aside $30 million for this program. In addition, in January 2018, TD bought its first technology company, an AI company called Layer 6 that specializes in predictive technology.

RBC's Approach to Personalization

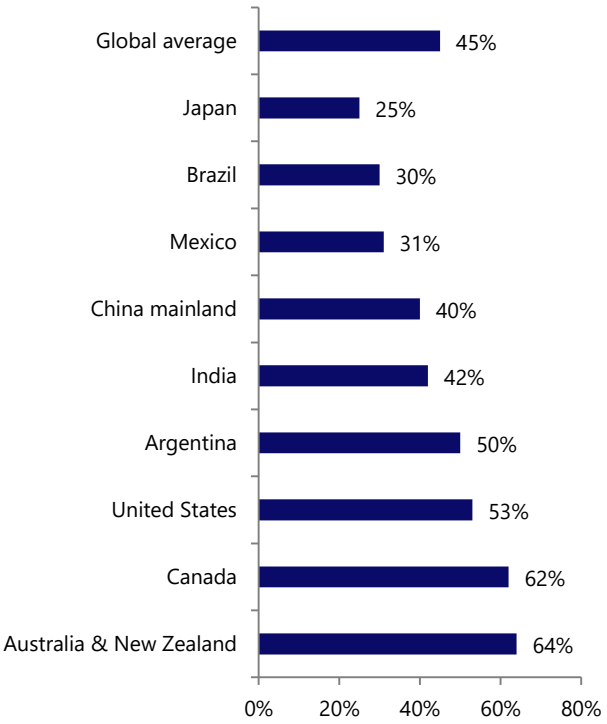
RBC has been experimenting and investing in a variety of different types of technology to improve product offerings and customer experience. For example, over the past few years, RBC has been experimenting with wearable technology and biometrics, most notably using heartbeat as an authentication factor. RBC Global Asset Management also announced that it will launch its own in-house innovation lab, committing $20 million over the next five years. In 2017, RBC was considered the most innovative bank in the insurance space because of its partnership with League, a digital alternative for health insurance, that allows it to offer more flexible insurance plans to small business. Additionally, RBC YourTerm offers more flexible life insurance to individuals. Furthermore, last year, RBC unveiled two digital services: NOMI Insights and NOMI Find and Save. NOMI Insights is a back-end technology that keeps track of activity in accounts and notifies account holders through the app if there is unusual activity. The program also helps RBC better understand the behaviour of its clients. NOMI Find and Save is an automated savings solution that uses predictive technology to identify money in a client's cash flow that can be automatically saved.

Scotiabank's Digital Banking

The Bank of Nova Scotia is one of the largest players in the online banking business. It acquired ING Bank of Canada in 2012, which was one of the first online banks in the country. The acquisition led to Tangerine, Scotiabank's digitally focused bank. Scotiabank was also the first bank in the country to implement voice-activated banking and Touch ID for its mobile app. This year, Scotiabank is also testing new digitally focused branches called Express and Solutions. These branches are for clients who prefer to visit branches for financial advice, but do most of their banking online.

EXHIBIT VIII

Share of Financial Institutions with FinTech Partnerships (2017)



Source(s): PwC

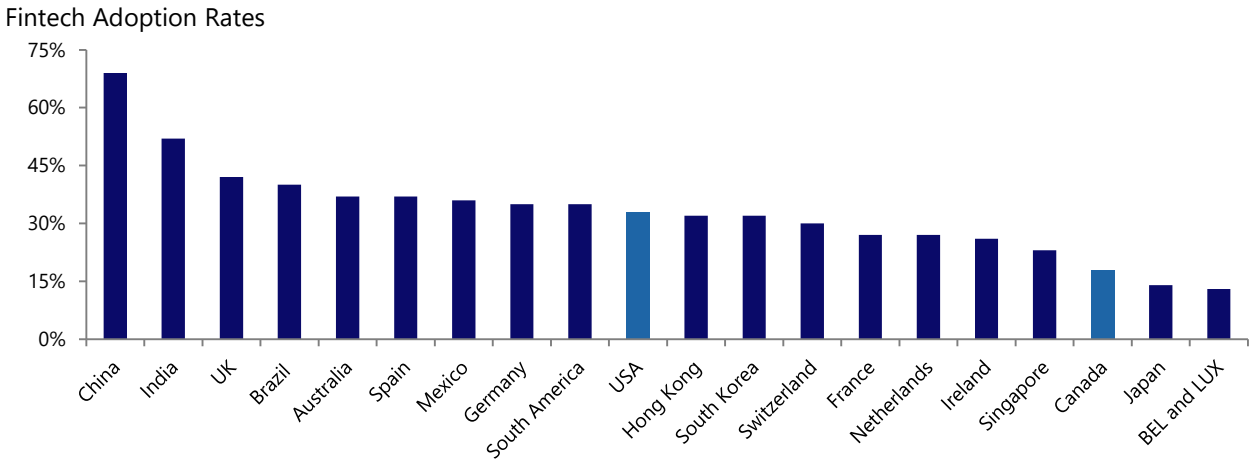
North American Regulation

The current regulatory environment of the financial industry in North America was created to protect citizens and the economy from the systemic risk of traditional financial companies, such as banks. As such, current regulations are ill-fit to manage the growing, innovative, fintech industry. While the fintech industry is comparably smaller than traditional financial institutions and is thereby less likely to impact the economy as a whole, it is inherently risky. The industry's small size makes it susceptible to economic shocks, its opaque nature makes it difficult to regulate, and its overall susceptibility to hacking and algorithmic decision making devices all contribute to its risk. The federal governments in the U.S. and in Canada are drafting legislation to modernize current regulations and limit systemic risk while still fostering industry growth. Generally, FinTech regulations are concerned with: Consumer Protection, Anti-Money Laundering, Investor Protection and Securities Regulation, Payment Processing, and Privacy and Data Security.

Regulatory Challenges

Fintech is an inherently difficult industry to regulate due to the opaque nature of its businesses. The two main issues with regard to FinTech regulation are: how to identify relevant actors and how to monitor them. For example, Bitcoin is characterized by its decentralization and anonymity. As a result, it is difficult to identify which actors to regulate. There is no centralized system which oversees the industry, users are often anonymous, and the creator of Bitcoin is infamously mysterious. Without knowing "who" or "what" to regulate, regulation is impossible. Even if regulators are able to identify the relevant actors, it is often difficult to monitor them. This challenge has arisen due to the innate complexity of FinTech companies, which regulators often do not understand in their entirety and are therefore unable to properly regulate. Additionally, the global nature of fintech firms can give rise to problems regarding countries' regulatory jurisdictions. Without clear, accurate, and timely information about risk creation within the FinTech industry, regulators are often unable to successfully mitigate systematic risk through effective regulation.

EXHIBIT IX



Source(s): Ernst & Young

North American Regulation Cont.

Current Regulations

The Canadian Financial Sector has long been characterized by heavy regulation. The FinTech space is no different and regulators seem unconcerned with fostering innovation in this industry. As a result of this strict regulatory environment, FinTech has seen slower growth in Canada than in other economies. According to the EY FinTech Adoption Index, a mere 18% of Canadians had used at least two FinTech products within the past six months, compared to the global average of 33%. Canadian regulation has limited several FinTech offerings, like peer-to-peer lending, which was constricted by the Ontario Securities Commission. Another gap within the Canadian approach to FinTech regulation is that Canada has no uniform policy mandate setting its desired outcomes in the FinTech industry. As a result, FinTech companies have little faith in Canadian regulators. Additionally, Canada has not provided specific regulatory structures crafted for this unique industry. Rather, regulators have relied on existing laws which do not take into account the different characteristics of the industry. However, one positive aspect of the Canadian financial environment for FinTech businesses is the uniformity of its regulations. Canadian regulations are primarily constructed at the federal level and are relatively consistent across provinces, in the few areas in which the provinces have jurisdiction.

Post-crisis financial regulation in the U.S. has been focused on ensuring stability. As such, U.S. regulators have been unwilling to create opportunities for FinTech companies, for fear of systemic risk. So, rather than create new regulations for FinTech companies that might fit the industry in a more effective manner, U.S. regulators are combing through current regulations of the greater financial industry and deciding which apply to FinTech as a whole or to certain types of FinTech companies. These ill-fitting regulations have impeded the growth of U.S. FinTech. A further hinderance on the growth of the U.S. FinTech industry is the siloed nature of regulators. Both state and federal governments have some degree of regulatory power over the financial industry. As a result, there are multiple federal and state regulatory bodies to which FinTech firms must adhere. This mixed regulatory system is complex and it makes expanding businesses past state borders difficult, due to differing regulations.

Changing Regulatory Landscape

In late January, the Canadian Competition Bureau (CCB) made a series of policy recommendations aimed at creating a lighter regulatory environment that is more conducive to innovation and competition in the FinTech industry. First, the CCB suggested that the degree to which FinTechs were regulated matched the degree of risk associated with them. While the CCB acknowledged risk in the FinTech space, it argued that some types of financial technologies pose less of a risk to economic stability than other types. As such, they concluded that lower risk FinTech companies should face less regulation. Further suggestions from the CCB included: that rules be principles based, that Canada make rules even more consistent across provincial lines, and that the federal government identify a clear and unified FinTech policy for Canada. Additionally, the CCB insisted that regulators keep up with changing market dynamics. Federal and provincial agencies have now begun to adopt policies that are beneficial to FinTech. For example, some provincial regulators have set up services meant to support FinTech start ups.

U.S. regulatory bodies appear to be recognizing the faults in its current treatment of the FinTech industry as well and are actively looking for more effective regulatory options. For example, the Office of the Comptroller of the Currency (OCC) has proposed issuing limited bank charters to FinTech companies. This change would bring FinTech firms under the regulation of the OCC, thereby giving FinTech firms access to payments infrastructure and exempt them from some individual state regulations. As well, the Consumer Financial Protection Bureau has implemented a no action letter policy intended to encourage consumer friendly innovations in the industry.

Portfolio Implications

Opportunities to Invest in FinTech

Given FIG's investable coverage universe in Canada and the U.S., there is a limited number of pure-play FinTech companies to invest in. As a result, moving forward due to the large weight of commercial banks in the index the FIG team believes there is a large opportunity to outperform by focusing on FinTech development within our bank holdings.

As FinTech development grows key areas of a banks operation including lending, asset management and insurance will be positively affected. The FIG team will then be able to identify competitive advantages associated with each bank and be able to effectively differentiate.

FinTech's Effect on FIG's Canadian Holdings

Banks

All three of FIG's Canadian bank holdings: RBC, TD, and BNS have all made several strides in the development and application of FinTech to drive growth and create value for their customers. As a result, we believe that these holdings provide FIG the best presence to capitalize on FinTech tailwinds. Information regarding these developments can be seen it the report section titled "Recent Developments".

Insurance

The insurance industry is heading down a path of disruptive technological innovations, whether it be through the effect of external factors, such as the rise of the shared economy, or the ability to improve operations using artificial intelligence. Though MFC has made strides in the direction of FinTech trends, closer investigation is necessary in order to understand its market position amongst disruptive entrants.

FinTech's Effect on FIG's U.S. Holdings

Banks

In the U.S. the large banks in our investable universe have all embraced FinTech trends with each making an effort to develop and implement these trends in order to gain a competitive advantage. Generally, this force to innovate has been carried through acquisitive transactions.

Within FIG's U.S. bank holdings we feel comfortable with its exposure to FinTech tailwinds. All three bank holdings: JPM, C, and MS, have adopted measures to remain competitive through FinTech. These developments can be seen it the report section titled "Recent Developments".

Payment Processing

FIG's payment processing conviction through Visa remains strong. The FIG team believes that as areas such as mobile payments continue to grow internationally, it will become even easier for Visa to capitalize. In the short-term, though there have been many new entrants into this space we do not see any of these new entrants becoming very disruptive. In the long-term we will continue to monitor the disruption of FinTech in this industry closer.

Asset Management

FIG continues to believe in BlackRock, a leader in the asset management space, due to their continued efforts of finding the right mix of technological improvements coupled with an customer centric pricing structure to remain the leader in a redesigned asset management industry.

References

1. Accenture
2. BI Intelligence
3. Bloomberg
4. Business Insider
5. CB Insights
6. Company Reports
7. Deloitte
8. Ernest & Young
9. IBISWorld
10. Investopedia
11. McKinsey Industry Primers
12. National Insurance Blog
13. Pitchbook Data
14. PwC
15. ThinkAdvisor
16. TrendForce