FINANCIAL INNOVATION SERIES

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AN OVERVIEW OF FINTECH IN CANADA

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INTRODUCTION

With each passing year, technology is becoming an increasingly integral part of our lives. New technologies are revolutionizing everyday tasks and fundamentally changing industries as we know them. The financial industry is no exception and is now in the midst of its own revolution. In recent, there has been a wave of new financial technology (FinTech) products and firms that offer increased automation and accessibility paired with cost savings, putting pressure on financial institutions (FIs) to do the same.

The United States and United Kingdom have proven to be FinTech leaders, offering regulatory sandboxes, tax-exemption benefits, and all-around encouragement for tech innovation. Monetary and regulatory barriers to entry in Canada's financial sector pose unique challenges for startups in this space, but Canada has nevertheless begun to emerge as another major FinTech hub.

The "big six" banks and other Canadian financial institutions have welcomed innovative technologies and have collaborated with FinTech firms to improve efficiencies and product offerings. Technological innovation has long been an area of focus in Canada and the financial services industry is no exception. Canada is home to one of the largest international financial hubs and has some of the world's top technological talent, making it a great environment for FinTech firms to flourish.

This report provides a comprehensive overview of Canada's FinTech landscape by comparing Canada to other FinTech hubs in terms of funding, regulations, and collaborations; discussing the geographic and categorical distributions of Canadian FinTech firms; and listing key players in the Canadian FinTech space. GRI will be releasing a follow-up report highlighting the risks and opportunities of Fintech to traditional financial institutions as well as to the financial system as a whole.

CANADIAN LANDSCAPE

The Canadian FinTech market has seen tremendous growth in recent years and is expected to continue to expand exponentially. The adoption of FinTech in Canada, although slow, has reached the Early Majority Adoption phase[1] and is expected to continue to grow. Canada's "big six" financial institutions will, no doubt, influence the ultimate FinTech adoption rate as Canadians tend to be more reluctant to change their banking habits than in other economies.

According to a survey by Accenture, nearly 64% of banking customers in Canada have been with their current bank for the past decade or more; a percentage that is higher than in most other countries. In the US, for example, the 10-year banking customer retention ratio is around 40%. Canada's high customer retention may be attributed to the big six's oligopoly but as we see new entrants to the market this number may change. In fact, more than 70% of survey respondents aged 18 to 34 in North America stated that they would be willing to bank with a company with which they do business that currently does not offer financial services, such as Google, Apple and Amazon[2].

This puts new competitive pressures on Canadian financial institutions moving them to become more innovative themselves. Canadian banks, for one, have undertaken multiple ventures to invest in innovative research and create partnerships with FinTech companies to increase their offerings. In 2013, the Canadian financial service industry spent $9.2 billion on information technology

Table 1: Leading accelerators and incubators across Canada with some of their Sponsors and Partners

CITY	CALGARY	TORONTO				VANCOUVER
Accelerator/ Incubator	Innovate Calgary	MaRS Discovery District	OneEleven	Rotman's Creative Destruction Lab (CDL)	Ryerson's Digital Media Zone (DMZ)	Launch Academy
Sponsors/ Partners	• *Canadian Digital Media Network* • *RBC* • *Telus* • *The City of Calgary* • *University of Calgary*	• *AMEX* • *CIBC* • *Ebay* • *Equifax* • *Manulife* • *P&G* • *Paypal* • *TMX*	• *Aviva* • *Deloitte* • *OMERS* • *Ontario* • *RBC* • *Rogers* • *Ryerson*	• *BDC* • *Comcast* • *KPMG* • *Mastercard* • *National Bank* • *RBC* • *Scotiabank*	• *Accenture* • *BMO* • *City of Toronto* • *Google* • *IBM* • *Microsoft* • *TD Bank*	• *BC IC* • *Creative Technology Solutions* • *EY* • *Google for entrepreneurs* • *VANTEC*

1 *LaMorte, Wayne W., (2016), "Diffusion of Innovation Theory", http://sphweb.bumc.bu.edu*

2 *Accenture, (2014), "The Digital Disruption in Banking", 2014 North American Consumer Digital Banking Survey https://www.accenture.com*

alone and has invested in incubators and accelerators to aid in the progression of FinTech innovation[3].

Incubators and accelerators provide FinTech firms with a wide array of services including mentorship, funding, networking, and/or training[4]. Shared office space may also be provided, allowing for open discussion and collaboration between firms. For the most part, incubators are focused on early-stage companies whereas accelerators are used by established firms looking to grow. These programs are generally run and funded by a combination of financial institutions, technology companies, consultants, and academics. For instance, Ryerson University's Digital Media Zone (DMZ) is partnered with BMO, TD, General Motors and the City of Toronto. Other notable incubators are introduced in Table 1. In general, acceptance into an incubator or accelerator is quite competitive – 9% of applicants are accepted by the DMZ[5] - as the services received are invaluable.

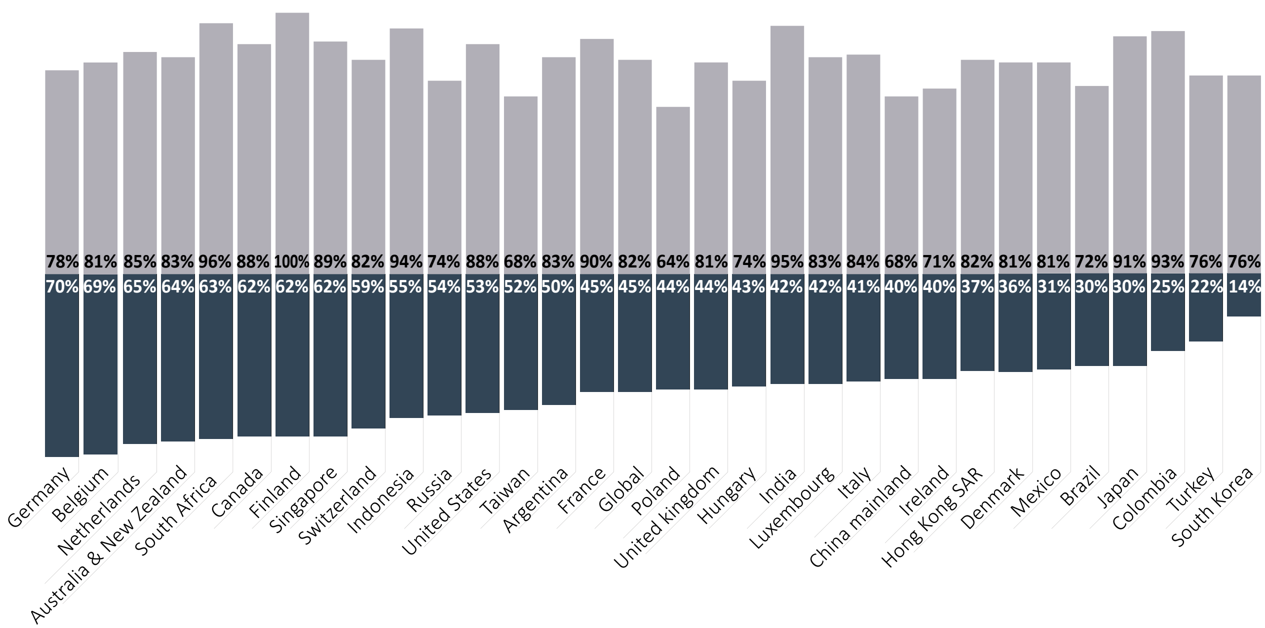
In addition, the number of financial institution-FinTech partnerships in Canada is substantially higher than in most other countries (Figure 1). As shown, 62% of financial institutions declared they are actively involved in partnerships with FinTech companies. This is 15% higher than the worldwide average of 47%, and 9% and 18% higher than the average for the US and the UK, respectively. In addition, Canadian financial institutions expect to continue to be leaders in collaboration with 88% of respondents stating they would increase partnerships going forward.[6]

Figure 1: Current and Expected Partnerships per country

Percentage of respondents expecting to increase partnerships over the next three to five years

Percentage of respondents currently engaging in partnerships with FinTech companies

Source: PwC Global FinTech Report2017



3 Province of Ontario, (2017), "The Centre of FinTech Innovation", https://www.investinontario.com/FinTech#intro

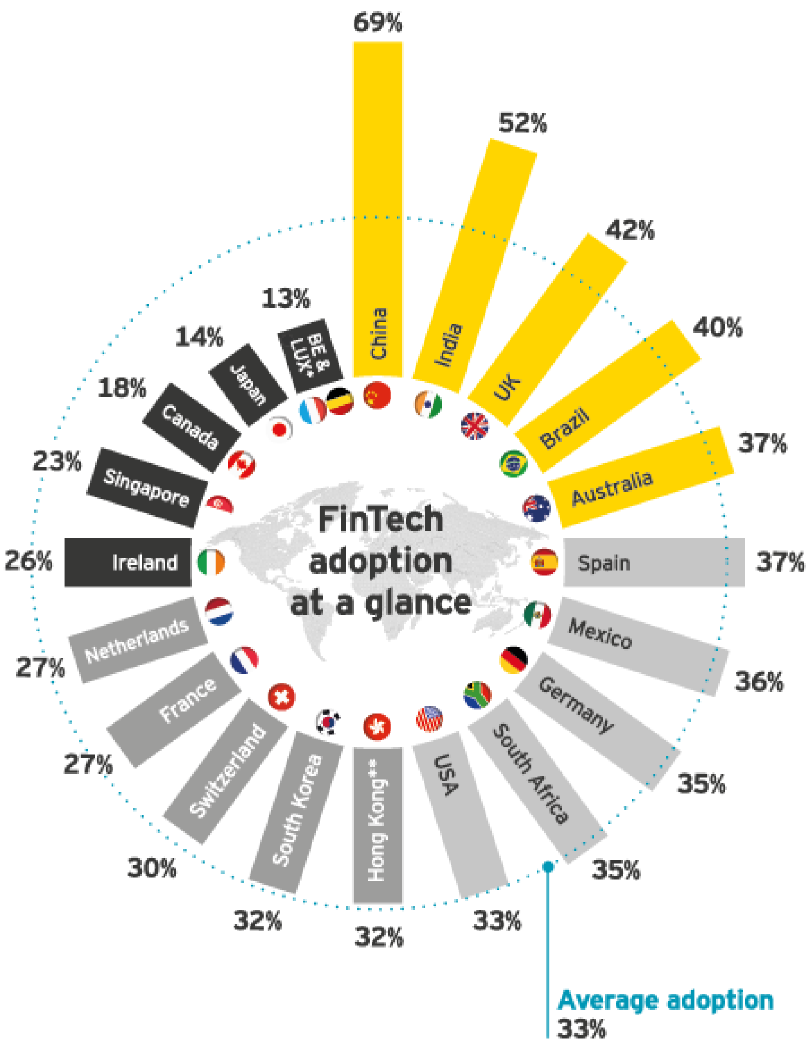
4 MaRS, (2017), "How do I find accelerators and incubators?", https://www.marsdd.com/mars-library/accelerators-incubators/

5 DMZ, "Apply to be our next startup success story", https://dmz.ryerson.ca/apply/

6 PwC, (2017), "Redrawing the lines: FinTech's growing influence on Financial Services", Global FinTech Report 2017, pp. 7 https://www.pwc.com

Figure 2: FinTech adoption rates by Country

Note: Shows FinTech users as a percentage of the digitally active population

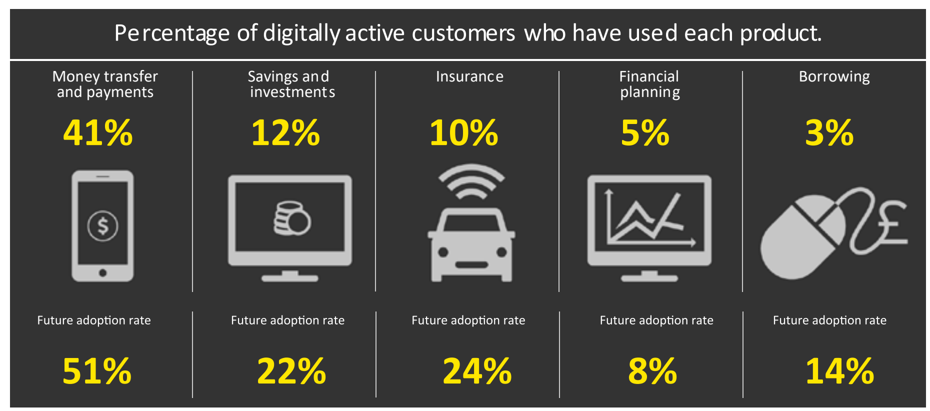


Source: EY FinTech Adoption Index 2017

Although the younger, more tech-savvy, generation may be comfortable with switching to non-traditional financial technologies, the older generation in Canada is not. A recent study by Ernst and Young (EY) that assessed the global adoption rate of FinTech in 20 different countries found Canada to have one of the lowest adoption rates globally (Figure 2). Canada's adoption rate lies around 18% compared to the mean of 33%. This may be attributed to the fact that in 2015 nearly 50% of respondents were not aware FinTech firms existed. Although awareness has increased to 78% in 2017, it will likely take time for consumers to get comfortable with this new paradigm. Unsurprisingly, the adoption of FinTech is much higher among younger Canadians; respondents between the age of 25 and 34 in Canada had an adoption rate of 33%. As FinTech gains momentum, the adoption is expected to grow to 34% in Canada and 52% globally.[7]

With each passing day, new FinTech firms enter the market. To provide an overview of the current Canadian market Figures 4 and 6 and Table 2 summarize the key characteristics of the top 150 Canadian FinTech companies[8]. For the purpose of

Figure 3: Most used FinTech services in Canada

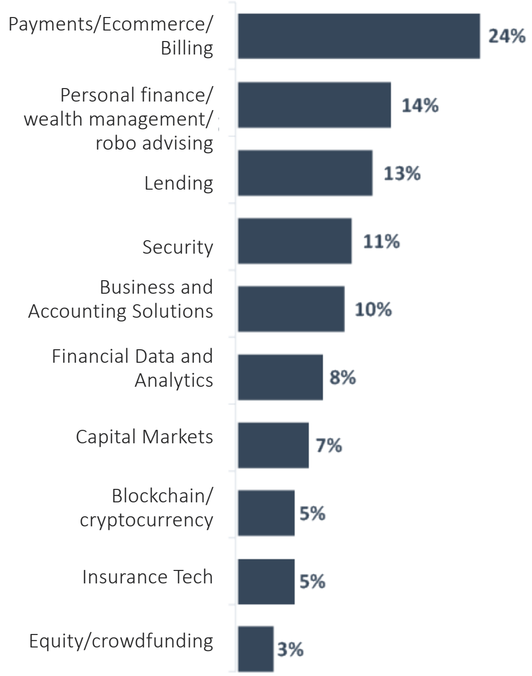


Source: EY FinTech Adoption Index 2017 – Canadian findings

7 *Ernst and Young, "EY FinTech Adoption Index 2017 – Canadian findings", http://www.ey.com.*

8 *The top 150 companies were selected based on the size of the firm, funding levels, and how often they were mentioned in the press. Data was collected in the last quarter of 2017.*

Figure 4: Breakdown of Canadian FinTechs by category based off of our top 150 firms



this report, companies were divided into ten categories: Payments/Ecommerce/Billing; Lending (Personal or Business); Personal Finance/Wealth Management/ Robo Advising; Security; Business & Accounting Solutions; Blockchain/Cryptocurrencies; Capital Markets; Equity/Crowdfunding; Financial Data and Analytics; and Insurance Tech. A list of leaders in each category can be found on page 7.

Across the various types of FinTech products found in Canada, money transfers and payments are the most-used at this time (Figure 3). Roughly a quarter of the FinTechs in Canada provide money transfer and payment services. The second-largest category is saving and investment services, with 14% of the market. Insurtech, although quite popular among Canadians as seen above, still represents a small fraction of the market (Figure 4). This may be in part due to insurers innovating and providing new products and services to their clients on their own. For instance, many insurance companies now allow you to submit and process claims online.

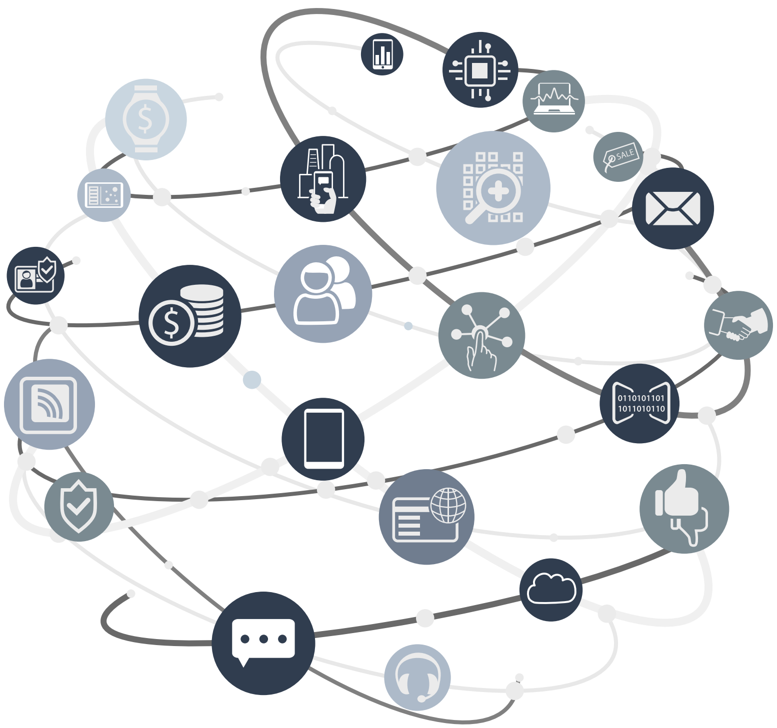
It comes as no surprise that Ontario is the largest FinTech hub in Canada (Table 2). With Toronto being one of the largest financial centers in the world and southern Ontario producing top tech talent from leading universities, the province is thriving in the FinTech space. British Columbia and Quebec, with access to talent and resources from Vancouver and Montreal, are expected to become leaders in the space as well.

Table 2: Geographic Distribution of FinTechs in Canada based off of our selection of the top 150

PROVINCE	ONTARIO	BRITISH COLUMBIA	QUEBEC	ALBERTA	NOVA SCOTIA	NEWFOUNDLAND
% of FinTech firms	56% *(Majority in Toronto)*	25% *(Majority in Vancouver)*	13% *(Majority in Montreal)*	4%	1.3%	0.7%
Highlighted firms	• *Shopify* • *FinanceIt* • *Wealthsimple* • *Borrowell* • *SecureKey*	• *Trulio* • *Grow* • *Mogo* • *Koho* • *Voleo*	• *Blockstream* • *Covera* • *Lightspeed POS* • *CoPower* • *Stoovo*	• *Katipul* • *Besurance* • *ZayZoon* • *Celero*	• *AnalyzeRe* • *Morrex*	• *Verafin*

Source: This data was largely sourced by Crunchbase https://www.crunchbase.com/

Figure 5: Leading Canadian FinTech Companies



FINTECH CATEGORIES

In this section, we will introduce the most common FinTech categorizations and the leading Canadian companies in each category. In cases where a company may fall into multiple categories, the company was assigned to the category which encompassed their primary business focus. For example, Grow, formerly known as Grouplend, began with a lending focus but recently has partnered with financial institutions to expand its services into complimentary products such as investment and insurance. We have categorized Grow as a Lending (Personal or Business) FinTech.

PAYMENTS / ECOMMERCE / REMITTANCES

According to the Digital Finance Institute's "FinTech in Canada" report, the payment transaction market grew by 210% in 2015. The payments industry is made up of services which provide systems that settle financial transactions through the transfer of monetary value. Although banks remain the leaders in payment systems, tech giants like AliPay, ApplePay, and PayPal are not far behind.[9] Moreover, companies like Amazon have revolutionized the eCommerce system, and many new entrants are offering quicker exchanges with better incentives.

Leading the Canadian payment systems is Shopify, who offers merchants software to develop their own ecommerce platforms. Shopify is one of the few Canadian FinTechs to have gone public, raising $1.27 billion from their IPO in mid-2015. Since then, Shopify's stock price has grown tremendously, from an IPO price of $17 per share to its current value of about $150.[10,11]

Other novel payment solution companies include Squirrel, which provides touch screen payment services for the hospitality industry, and Soundpays, which has created a new commerce channel through sound wave technology that allows users to buy directly from advertisements.

Remittances are similar to payments and money transfers, but they are specifically used by immigrants to send money to their families in their country of origin, and they play a significant role in reducing poverty levels in developing countries. Worldwide remittances reached $575 billion in 2016, and they are estimated to increase to $593.8 billion and $615.9 billion in 2017 and 2018, respectively.[12]

Currently, 90% of remittances are done offline so there is a huge market for FinTech companies who can provide online solutions, which reduce transaction costs by 5.57% to 10.86% on average. These savings are economically significant, since many remitters' families live close to or under the global poverty line. Some banks are collaborating with FinTechs to allow customers to improve their remittance experience.[13]

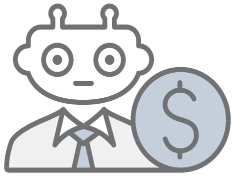
9 *The Digital Finance Institute, Christine Duhaime, McCarthy Tetrault LLP, Genevieve Pinto, (2016), "FinTech in Canada – British Columbia Edition", pp. 3*

10 *Tobia Lutke, (2015), "This is the latest $1 billion tech company to IPO", Fortune*

11 *Yahoo! Finance, "Shopify Inc.", Cited on February 27th, 2018,*

12 *World Bank Group, (2017), "Migration and Remittances – Recent Developments and Outlook", Migration and Development Brief 27, pp.2*

13 *Ibid The Digital Finance Institute, "FinTech in Canada – British Columbia Edition"*



PERSONAL FINANCE / WEALTH MANAGEMENT / ROBO ADVISORS

Wealth management is another area where FinTechs have begun to provide cheaper, more flexible solutions than traditional financial institutions. To begin investing, these online wealth advisors – also known as "robo-advisors" – will ask you a series of questions about your financial goals and risk tolerance and will use this data to construct a diversified portfolio of low-cost ETFs that suits your needs. Although these investments may be a great choice for tech-savvy individuals looking to invest, these companies still have a long way to go in developing more personalized offerings such as tax savings programs and retirement or estate planning.[14]

According to the Swiss research group MyPrivateBanking Research, robo-advisors are expected to be managing approximately $255 billion worldwide by 2019. However, robo-advising faces unique challenges in Canada.[15] The OSC stated that, "anyone selling securities or offering investment advice in Canada must register with their local securities regulator."[16] Robo-advising firms have been fighting regulators to make exceptions as many Canadian FinTechs are currently forced to have an initial "Know Your Client" conversation with customers before they can begin the investment process. The whole process can be done online, however, FinTechs must employ financial advisers for the onboarding process which increases their costs.

Some companies, like Nest Wealth, are avoiding this issue by creating a digital onboarding process which observes clients' investing behaviour and assigns the client to an appropriate advisor given their investment goals and risk tolerance. Nest Wealth recently received a $6 million investment from Montreal's National Bank. In exchange Nest Wealth will license its investment technology to National Bank to allow their advisors to use Nest Wealth's platform to digitalise managing clients' money.[17]

Overall, this sector is seeing record funding. Wealthsimple, Canada's largest robo-advisor, recently raised approximately $37 million in capital from Power Financial Corp. Wealthsimple does not have a minimum investment requirement, making it an appealing choice for a broad range of audiences. It is currently a leader in its group with roughly $1 billion in assets under administration.[18]

Many of Canada's major banks have also launched their own internal robo-advising initiatives. BMO's Smartfolio, for example, asks clients to fill out an online questionnaire before being assigned a portfolio manager who will then invest their money into BMO ETFs.

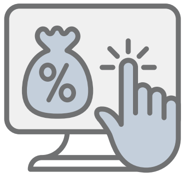
14 *The Canadian Press, (2016), "Robo-advisers appeal to millennials with low costs and tech savviness"*

15 *MyPrivateBanking Research, (2014), "Robo-advisors: threats and opportunities for the global wealth management industry", MyPrivateBanking Report ed. 1*

16 *Ontario Securities Commision, "What to look for in an adviser", Cited on February 28, 2017*

17 *Amria Zubairi, (2017), "National bank investing $6 million in nest wealth, plans to integrate its robo-advisor tech"*

18 *Ryan Lawler, (2017), "Robo-advisor Wealthsimple raises another $37 million from Power Financial", TechCrunch*



LENDING (PERSONAL OR BUSINESS)

The FinTech lending sector consists of non-bank platforms that provide rapid onboarding, serve a wider range of clients than traditional financial institutions, and in some cases offer lower interest rates.[19] These platforms grew tremendously in popularity for small to medium businesses and individuals after the financial crisis. The combination of stringent regulations, tightened lending standards, and reduced liquidity after the crisis created an opportunity for FinTechs, who are not subject to the same level of regulatory requirements, to serve businesses and individuals who were turned down by traditional financial institutions for mortgages, business loans, and other lines of credit.[20]

In late 2016, Borrowell began a partnership with CIBC, allowing it to use Borrowell's platform to adjudicate loans in real time to existing online customers, providing them with funds typically issued into a client's account the next business day.[21] This was the first partnership between a major Canadian Bank and a digital lending FinTech. Since then Borrowell has seen tremendous growth, recently receiving $57million in financing ($7 million in equity and $45million in new credit facilities). The company, having only just launched in 2015, now has over 300,000 users, excluding those that access their platform through CIBC.[22]

FinanceIt, a cloud-based point-of-sale financing platform; FundThrough, which helps small business owners navigate their cash flow challenges by accessing the working capital in their unpaid invoice; and Thinking Capital, which offers tailored ideas to grow businesses and get quick access to capital, are examples of other successful financial lending companies that provide flexible access to credit for their customers.

19 Value Penguin, (2017), "Comparing Costs For A Marketplace Loan Vs. A Bank Loan", Nasdaq

20 Philippe Gelis & Timothy Woods, (2014), "The Rise of Fintech in Finance – How fintech is reshaping the finance sector and how you handle your money", kantox, pp. 4

21 Cision, (2016), "CIBC partners with fintech innovator Borrowell to deliver "one-click" online loans", http://www.newswire.ca

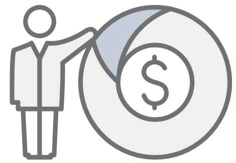
22 National Crowdfunding & Fintech Association, (2017), "Borrowell raises $57M in New Funding to Expand Credit Education and Lending", http://ncfacanada.org/12610-2/

SECURITY

Over the past few years, we have seen an increase in the number, scale and sophistication of cyber-crimes with events such as the hack of the central bank of Bangladesh, the Wannacry Ransomeware, the Equifax data breach, and the WikiLeaks data trove which released thousands of documents allegedly stolen from the CIA.

In response, large corporations have hired internal and external teams to research and prevent cyber-crimes while ensuring their teams will be able to quickly react to cyber threats by regularly running “fire drill” type breaches to monitor response time. Seeing an opportunity in this space, FinTech companies have leveraged their deep technological knowledge to provide in-depth research and develop products to enhance security in financial institutions that are exposed to cyber risks.

There is a wide variety of Canadian tech startups that are geared towards protecting financial institutions of all sizes from cyber threats. BioConnect offers biometric security solutions for a wide range of devices, changing the future of identity security. Iota Security provides advanced cyber threat defenses for mobility and IoT (Internet of Things). Award-winning FinTech company APrivacy provides the banking industry with information security and tracking services and eSentire develops advanced threat solutions for hedge funds.



BUSINESS AND ACCOUNTING SOLUTIONS

Business and Accounting solutions make up 10% of Canadian FinTech market. According to FreeAgent, 20% of accountants spend most of their time processing expenses, and FinTechs in this space offer a wide range of solutions like online bookkeeping, expense reporting, and timesheet and payroll solutions that make it easier and cheaper for businesses to complete these tasks.

Wave Accounting was recently featured in CB Insights’ top 250 leading FinTech firms around the world.[23] The company recently received $32 million in capital from investors including RBC, Exhibition Capital and National Australian Bank. The company delivers financial management software to small business and is said to be using the money to accelerate the development of their products. In particular, it is looking to develop its use of machine learning techniques to automate basic accounting processes and consult customers based off of financial analytics.[24]

FreshBooks allows business to manage invoices and recurring subscriptions and collect online payments within the same system and in less than no time. FreshBooks is used by over five million businesses to streamline time tracking and client invoices. It was recently awarded Best Accounting Software Award for 2016.

23 *CB Insights, (2017), “The Fintech 250”, https://www.cbinsights.com/research-FinTech250*

24 *Neil Ainger, (2017), “Canadian fintech Wave raises $24 million from RBC and other investors”, CNBC*

FINANCIAL DATA & ANALYTICS

Technological progress in information storage and processing has made it possible to analyze greater volumes of data than ever before, spurring exciting new developments in the fields of machine learning and artificial intelligence. FinTechs and traditional financial institutions alike have begun to take advantage of these new capabilities to analyze data from all aspects of the finance world.

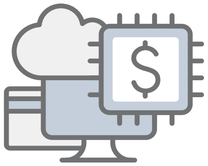
Montreal has become an industry leader in Artificial Intelligence (AI) research, with Facebook, Thales, Alphabet Inc.'s DeepMind Technologies, and Samsung's Advanced Institute of Technology all recently opening labs or hiring researchers there.[25] Yoshua Bengio, one of the three "co-fathers" of deep learning, is a leading factor in Montreal's pre-eminence as a global AI hub. Bengio has spawned multiple ecosystems such as the Montreal Institute of Learning Algorithms (MILA) which was funded by the government, Google, Microsoft and other private sector companies, and Element AI, which build applications with industry partnership to commercialize AI and was funded by Microsoft Ventures.[26]

Quandl, one of the few pure data analytics firms, recently received $12 million in Series B funding from Nexus Venture Partners. This was the biggest funding seen in the data analytics FinTech sector in Canada. The company provides alternative data—data gathered from non-traditional information sources — to generate predictive insights for capital markets. Quandl's founder and CEO stated that they believe alternative data will likely explode and be the primary driver of active investment performance over the next decade. Quandl's offerings compete against those of Thomson Reuters and Bloomberg; however, unlike its competitors, Quandl allows users to access its data through APIs available in a wide range of programming languages.

In addition, Aislelabs and North Side, received large VC funding for $1.5 and $4.9 million, respectively. Aislelabs uses big data analytics to assist retailers in achieving better and increased sales while Montreal-based North Side Inc. focuses on Natural Language processing to allow users to do banking transactions via text message or even completely hands off.

25 *Sean Silcoff, (2017), "Thales becomes latest global giant to open AI lab in Montreal", The Globe and Mail*

26 *Denise Deveau, (2017), "Revolution AI: Why everyone wants in to Montreal's deep-learning hub", Financial Post*



CAPITAL MARKETS

Similarly, the Capital Markets sector stands to continue to benefit from new developments in machine learning which can be used to enhance trading processes. Some large financial institutions and hedge funds have already taken advantage of machine learning and AI to develop trading strategies but there is great potential for further developments. FinTechs have begun to develop online trading sites, which enable any individual to enter into trades through means as simple as their smartphone.

Within this field, companies such as New York's Cadre, have been changing the way we think about investing. Cadre, one of the fastest growing FinTech's in the world and listed on Forbes' FinTech top 50, offers qualified high net worth individuals and institutions to partake in real estate investment opportunities that they traditionally would not have access to buy directly and at lower fees than typically charged by real estate investment funds.[27]

Canada's largest capital markets FinTech, Real Matters, has grown tremendously in the past few years from a small start-up in Thornhill, Ontario, to its current valuation of $600 million. The company broke records as the largest technology IPO on the TSX in a decade, raising $114 million at the beginning of the year.[28] Real Matters "combines proprietary technology and network management capabilities with tens of thousands of independent qualified Field Agents to create a marketplace for mortgage lending and insurance industry services. Field Agents, such as residential real estate appraisers, compete to deliver performance-driven services, bringing superior quality, transparency and efficiency to traditionally high-touch, costly, labour intensive and lengthy processes".[29]

27 Forbes, "Fintech 50", Cited October 25, 2017, Forbes

28 Garry Marr, (2017), "Real Matter Inc debuts in one of the TSX's largest tech IPOs in a decade", Financial Post

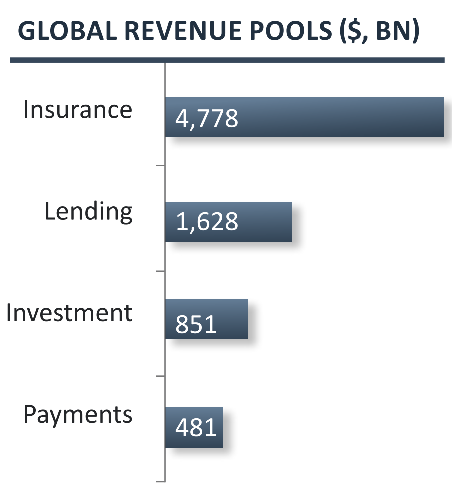
29 Real Matters, "Our Platform", Cited on October 25, 2017, http://www.realmatters.com/about/our-platform/default.aspx

INSURANCE TECHNOLOGIES

For the past decade, InsurTech has long been overshadowed by other forms of FinTech, however, this is beginning to change. Willis Towers Watson recently reported that the global InsurTech funding volume has increased by 248% to $985 million in Q2 2017,[30] and CommerzVentures, the FinTech Venture Capital (VC) department of Germany's Commerzbank, believes that insurance represents the largest long-term opportunity in FinTech (Figure 6).

Financial institutions will benefit from implementing new insurance technologies as they will result in massive cost reductions, improved efficiency, and heightened security. Out of all technologies, AI, Blockchain, and connected New Payments, may have the largest impact on the value chain of InsurTech. Below in table 3 are just a few areas where these technologies will have a strong impact:

Figure 6: Global Revenue Pools



Source: CommerzVentures, (2016)

Table 3: Impact of some Insurance Technologies

TECHNOLOGY	ARTIFICIAL INTELLEGENCE	BLOCKCHAIN	NEW PAYMENTS
Primary Impacted Value	*Underwriting & Risk*	*Claims Management*	*Distribution*
Use Cases	• *Analysis of individualized data to improve risk models, reducing required capital* • *Form customer portfolios with negative risk correlation* • *Help doctors and other third parties combat risks*	• *Full automation of claims processing and record keeping* • *Reduce fraudulent activity* • *Payment validation and documentation* • *Automated contractor and adjuster contracts*	• *Expansion and increased offering in emerging frontier markets as well as underinsured in developed markets* • *Connected devices as sales channels* • *Short-term instant insurance*

Source: CommerzVentures, "Emerging Technologies Transforming the $4tn Insurance" March 2016

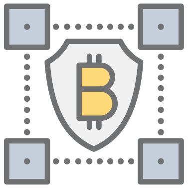
30 *Willis Towers Watson, Willis Re, CB Insights, (2017), "Quarterly InsurTech Briefing Q2 2017", pp. 37*

VC funding for InsurTech in Canada has been lower than in other sectors. However, digital health insurance start-up League Inc. overcame the low funding environment of the category by raising CAD$25 million in Series A funding from a variety of high-profile, Canadian investors. League Inc. provides businesses with wellness benefits like nutritionist services, yoga, and gym memberships to employees via mobile apps that match them with providers.[31]

In the US, leading the InsurTech industry is Lemonade, whose motto is "rethinking how insurance is done in a different fashion". Lemonade allows users to sign up for insurance completely online by conversing with a bot and responding to questionnaires. The bot then assigns the individual the most appropriate insurance given their data. At the end of each year, the company donates the remainder of the premium pool (premiums – claims - Lemonade costs – reinsurance) to charity.

There have also been many advancements in automotive insurance. Companies and individuals can now purchase devices which track and assess a drivers' driving habits. These devices can measure everything from speed to how sharply a driver takes a turn. Ideally, safe drivers would be able to purchase these devices to prove to their insurance companies that they are safe drivers to reduce their premiums. An example of such a company is Oakville based Geotab, which provides a variety of services to fleet management including telematics technology. This monitoring approach can help prove no-fault to the insurance provider if an accident were to occur.

31 *Clare Brownell, (2016), "Digital health insurance startup LEAGUE raises $25 million from major Canadian investors", Financial Post*



BLOCKCHAIN AND CRYPTOCURRENCY

Blockchain Technology is a decentralized digital ledger which continuously updates transactions instead of having a central administrator like a traditional database. When someone performs a transaction, it is encrypted with other transactions as a “block” and “miners” compete to validate the transaction by solving a complex cryptography question using high levels of computing power in exchange for newly issued currency and/or a fee. Once verified, the “block” is added to the ledger and will remain there forever. For example, cryptocurrencies use blockchain to record transactions from one anonymous user to another on a public ledger.

In addition to the use of blockchain for cryptocurrencies, many other uses have been developed for the technology, like online trading platforms for capital markets. In 2016, RBC’s CEO, David McKay, stated that the bank intends on spending at least 40% of its overall technology budget on innovation, flagging AI and blockchain as the most transformative technologies in banking.[32]

The adoption of Blockchain remains in its preliminary stages, however, those that have become aware of the new system see its potential as a great disruptor to the current financial system. According to Deloitte’s blockchain survey, 55% of executives who know about the technology stated they would lose competitiveness if they did not adopt it, and 42% believe it will disrupt their industry.[33]

32 Matt Scuffham, (2017), “RBC targets 40 percent of total technology spend for innovation”, Reuters

33 Deloitte, (2017), “Deloitte blockchain survey 2017 – Blockchain reaching beyond financial services”

CROWD AND EQUITY FUNDING

Crowd and equity funding are fundraising platforms for investors to pool together money to be used for anything from funding a company to paying personal medical bills. Crowdfunding is more often used to fundraise for more public causes, meanwhile equity funding is specific to raising capital for a business. The introduction of crowdfunding within Canada has opened new opportunities for retail investors to invest their capital directly into companies looking to raise funds in the private capital market.

Equity crowdfunding is different in the sense that it uses pooled money to invest into businesses in exchange for equity; therefore, falling under securities law and requiring heavier regulations. Currently, it in legalized in British Columbia, Saskatchewan, Manitoba, Ontario, Quebec, and Nova Scotia, and is under review by regulators in the remaining provinces.[34]

SeedUps Canada was the first online equity crowdfunding platform, which was introduced as an expansion of UK's SeedUps.[35] It works together with ATB Financial, Alberta's largest financial institution, to allow early stage companies the opportunity to raise capital from a broad range of investors.[36] Companies seeking investments through the platform cover a wide range of industries including jumpOn flyaways, SeedUps Canada's first client, who runs a platform to allow people to bid on unsold airplane seats, and Madison's 12|12, the first restaurant to be funded by the Canadian funding portal.[37]

The equity/crowdfunding sector remains a fairly new sector with companies in this category making up only 3% of the companies introduced in this report. Additional companies within the sector include Katipult, which provides software infrastructure for private placements and crowdfunding, and Fundingportal who, like SeedUps, helps companies receive funding.

34 *Canada Business Network, "Crowdfunding", Government of Canada, Cited on October 25, 2017, Governmant of Canada*

35 *Calgary Herald, (2014), "Startup of the Week – SeedUps Canada"*

36 *Barry Strader, (2015), "Crowdfunding, with Equity!", We are Alberta, http://www.crowdcapital.ca/*

37 *Samantha Hurst, (2016), "Madison's 12|12 Looks to Raise $100,000 on SeedUps Canada for Inglewood Neighbourhood Restaurant Location", Crowdfund Insider",*

FUNDING

The FinTech funding landscape in Canada has seen tremendous growth in recent years, with a noticeable increase in 2016. From a global perspective, FinTech funding in Canada is relatively small, but Canada is an attractive place to set up shop given its extensive tech talent and established financial infrastructure and thus will likely see an increase in funding in the coming years.

There exist many different ways for a start-up to receive funding. Of those, the most common are Seed, Series, Crowd, and Equity.

Seed funding supports firms in the earliest stages of development. Funds are typically used to hire a team to produce market research to develop a strong product. Seed funds average $500,000 to $2 million but can vary tremendously. Investors often include "angels" and early-stage funding venture capital (VC) firms.[38] Angel investors differ from venture capitalists as they often use their own capital to fund companies, whereas VCs will usually pool together other investors' money.

A recent example from mid-October of this year is Montreal-based Covera, an InsurTech company, which received seed funding from Ferst Capital and angel investors in the amount of CAD$1.5 million. The funding will be used for Covera to build a team to accelerate product development and increase user acquisition initiatives.[39] Ferst Capital is a leading early-stage venture capitalist firm focused on FinTech in Canada. Ferst Capital has contributed funds to 17 FinTech companies, helping these companies raise over $16 million.

Within the series stage, there lie many layers of funding groups. Most commonly, there are Series A, B, and C. Series A, B and C represent the optimizing period for a company, the building stage, and the scaling phase, respectively. Series A funding is on average offered in the amount of $2 to $15mm, and often provided by more well-known venture capital firms such as the Business Development Bank of Canada Venture Capital department (BDC VC). Capital raised in Series B funding is often in the range of $7 to $10 million and includes many of the same investors as Series A. Series C funding is the next stage where companies are looking for that final push that will lead an already successful business to expand. Companies within this funding stage have already built an established business and are therefore less risky, thus more investors come into play at this stage. Investors include private equity, investment banks and hedge funds.[40]

Crowdfunding is a new way for companies or groups to raise capital by reaching out to a very wide audience.

38 *Shoshanna Delventhal, (2017), "Series A, B, C funding: How it works", Investopedia*

39 *Ted Liu, (2017), "Covera secures $1.5M seed funding led by Ferst Capital Partners", Private Capital Journal*

40 *IBid: Shoshanna Delventhal, (2017), "Series A, B, C funding: How it works"*

And finally, of course many successful FinTech companies have gone public and raised money through IPOs. Companies such as previously mentioned Shopify were able to raise $1.27 billion in capital during their initial public offering.

The table to the right contains a breakdown of funding in different provinces from January 1, 2015 to the end of Q3 2017. The Greater Toronto Area (GTA), having the highest concentration of FinTech companies in Canada, receives approximately 75% of the funding.

FinTech funding is relatively volatile over time, with spikes driven by large, one-off investments (Figure 7). For instance, in Q1 2016 Ceridian Canada received $150 million in funding from American private equity firms. The funding was used to sustain growth of one of the company's key products which grew 59%. Other notable quarters include the most recent quarter (Q3 2017) and Q3 2015. The most recent quarter's funding jump was driven largely by two Series B investments, each in the amount of roughly $40mm, for Tulip Retail and Freshbooks Accounting.

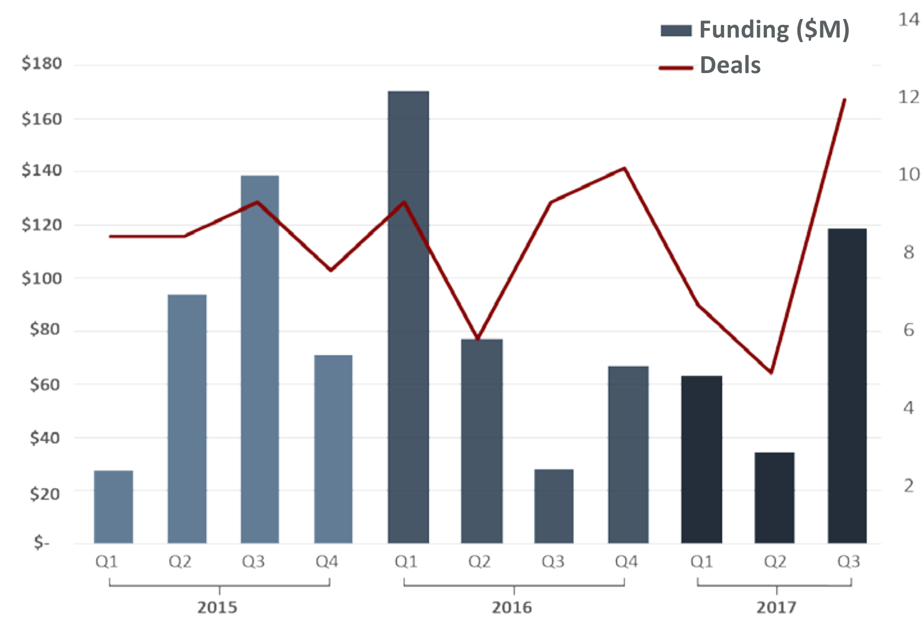
Over the years, Canada has received FinTech funding commensurate with its GDP, but it still lags behind the US and other FinTech centers in aggregate funding. Canada has historically had a small technology sector, but this is quickly changing with the introduction of incubators and hubs across the major cities. In addition, the regulatory landscape has been less permitting in Canada compared to other countries.

Table 4: FinTech Investments per province

PROVINCE	ONTARIO	BRITISH COLUMBIA	QUEBEC
Funding ($M)	**685.57**	**115.34**	**87.17**
Deals	**59**	**23**	**13**
Top Investors	BDC	BDC	Ferst Capital Partners
	Portag3 Ventures	Altos Ventures	Fond Action CSN
	Real Ventures	Contour Ventures	Innovation Support
	Power Financial	Nexus Venture Partners	CDPQ
	OMERS Venture	Point Nine Capital	Investissement Quebec

Source: Data sourced from CB Insights

Figure 7: Canadian Quarterly FinTech Funding



Source: Data sourced from CB Insights

This is also drastically improving, as will be discussed in the Regulation portion of this report. Finally, the adoption rate of FinTech by Canadian consumers is relatively low, which may lead some venture capitalists to invest into FinTechs established in more dynamic environments.

Table 5: Yearly FinTech Investments per Country

COUNTRY		2012	2013	2014	2015	2016	H1 2017	Average /GDP
CANADA	Funding ($M)	90	153	209	332	371	94	**1.51%**
	Deals	15	22	24	36	37	11	
US	Funding ($M)	1,940	2,960	9,230	8,230	5,970	3,710	**3.04%**
	Deals	337	423	506	533	551	253	
UK	Funding ($M)	183	705	576	1,140	537	561	**2.37%**
	Deals	33	44	76	100	97	60	
Germany	Funding ($M)	26	63	123	181	461	220	**0.49%**
	Deals	7	14	13	16	40	22	
China	Funding ($M)	53	152	809	4,000	10,300	1,730	**2.73%**
	Deals	4	10	37	49	66	38	
Japan	Funding ($M)	1.3	14	60	73	203	58	**0.14%**
	Deals	4	9	16	10	19	10	
Singapore	Funding ($M)	10	45	6	163	71	61	**1.98%**
	Deals	6	9	6	26	35	17	

Source: Data sourced from CB Insights and World Bank, (2017), "Gross domestic product 2016", World Development Indicators database, pp. 1

COLLABORATIONS

Many financial institutions and tech companies have seen the benefits of the FinTech sector and have sought out companies to invest in or partner with.

Accenture estimates that roughly 35% of banking revenue will be at risk by 2020 due to disruption in the FinTech sector. However, according to EYs recent report, "unleashing the potential of FinTech in banking", the primary driver of FinTech disruption in the financial service sector will be from collaboration, and not from competition. In other words, the biggest threat comes from competitors better leveraging FinTech.[41]

JPMorgan and Goldman Sachs have both employed a large quantity of tech-savvy employees. JPMorgan has boasted that they employ more software developers than Alphabet Inc., meanwhile 25% of Goldman Sach's employees build technology tools and platforms. With this scale and internal technological knowledge, these giants are capable of working with FinTech companies to develop new solutions for the market.[42]

Canadian banks have become leaders in investing in innovative technologies. RBC for instance has developed a collaboration with League, an Insurtech company, to offer clients a new option for managing their employees' health care expenses.[43] In addition to the aforementioned collaborations, CIBC has also begun working with Thinking Capital to provide small business with quick financing through Thinking Capital's established online platform.[44] TD Bank Group just acquired Layer 6, an AI startup that uses AI to analyze various forms of data to learn and anticipate an individual's spending habits and needs.[45] On the pension side, Caisse de Depot recently increased its FinTech presence by investing $100 million in AvidXchange, a provider of accounts payable and payment automation solutions for midsize companies.[46]

IBM has taken the approach of aiding FinTech companies to attain the interests of financial institutions; for example, they partnered with Toronto-based Dream Payments to help US small and midsize businesses (SMBs) and financial institutions adopt mobile tech. Dream Payments has been seeking to expand into the US market, having just raised $10 million in Series A funding to focus on its US expansion.[47]

Canadian Financial institutions have taken an active role in supporting the development of financial technologies, whether that be through in-house initiatives or through collaborations with external FinTech companies. Looking to the future, we can expect financial institutions to continue supporting these innovative technologies, bringing new products and offerings to their clients and helping to maintain their competitive edge.

41 *Ernst & Young, (2017), "Unleashing the potential of FinTech in banking", pp. 3*

42 *Ray Sharma, (2017), "By sitting on the sidelines in fintech, Canada risks losing golden reputation in banking", The Globe and Mail*

43 *Alastair Sharp, (2016), "Toronto health startup League teams up with RBC to enter insurance market", Business News Network*

44 *Cision, (2015), "CIBC and Thinking Capital redefine small business borrowing in Canada with real-time adjudication, faster funding"*

45 *Armina Ligaya, (2018), "TD Bank buys Layer 6, a Toronto-based artificial intelligence startup", The Star*

46 *Caisse de Depot et placement du Quebec, (2017), "CDPQ invests in AvidXchange, increasing its presence in the FinTech industry"*

47 *Jessica Galang, (2017), "IBM Partners with Dream Payments to help financial institutions adopt mobile tech", Betakit*

REGULATION

The rapid growth of the FinTech sector paired with the fact that many FinTechs operate outside of existing regulatory frameworks has spurred concerns that the industry needs more stringent regulations and oversight.

Canadian FinTech-specific regulations, although improving, lag behind those in other tech hubs like the US and the UK, which have developed more comprehensive regulations. A recent EY Report highlighting the UK's FinTech ecosystem noticed its strong policy environment, effective tax incentives and numerous government programs that aid FinTech firms in establishing their businesses.[48] Although these stances have not yet been introduced in Canada, we are seeing major steps forward with the introduction of initiatives such as the CSA Regulatory Sandbox and OSC Launchpad and the increase in incubators and accelerators.

The Canadian Securities Administrators (CSA) launched the Regulatory Sandbox Initiative in February 2017 which was designed to streamline regulatory challenges that provincial regulators had already set out to combat on their own. The Sandbox allows each firm who meets the CSA's criteria to register and/or quickly obtain exemptive relief from some Canadian securities laws. Each provincial regulator will vet companies within their province and send those they accept to the CSA for ultimate approval.[49] A summary of the process can be seen in Figure 8.[50]

Figure 8: Summary of CSA Regulatory Sandbox Process

DISCUSS

The firm presents its business model to its local securities regulator's staff. *Staff will analyze the business model and ask questions. Staff will work with the firm to identify the regulatory requirements for which registration and/or exemptive relief may be needed. Staff and the firm may also discuss the firm's eligibility to participate in the CSA Regulatory Sandbox, including limits and conditions that could be imposed.*

APPLY

The firm files an application with its local securities regulator to register and/or obtain exemptive relief from regulatory requirements. *Although filed with its local securities regulator, the application can be made under the passport regime, giving the firm access to capital markets in multiple jurisdictions. Staff of the firm's local securities regulator may provide assistance to the firm or its advisors, as applicable, to guide the firm and its counsel for preparing the application.*

REVIEW

CSA staff reviews the application on an expedited basis.

TAILOR

CSA staff determines the limits and conditions that will apply to the firm in the CSA Regulatory Sandbox.

OPERATE

If the firm agrees to the tailored program, it will receive authorization to operate for a given period in the CSA Regulatory Sandbox, subject to the limits and conditions imposed on its registration and/or exemptive relief.

Source: Canadian Securities Administrators, "CSA Regulatory Sandbox"

48 *Ernst & Young, (2016), "UK FinTech on the cutting edge – An evaluation of the international FinTech sector", pp. 11*

49 *Alastair Sharp, (2017), "Canada's securities regulators launch fintech 'sanbox'", Reuters,*

50 *Canadian Securities Administrators, "CSA Regulatory Sandbox", cited November 25, 2017*

In Ontario, the OSC Launchpad was introduced in October 2016 to provide advice to start-ups with regards to consulting and regulations. This was the first launchpad in Canada, and has since led other regulators in Canada to release similar initiatives. On November 7, 2017, the Ontario Minister of Finance stated the government would create a "regulatory super sandbox", which will consist of new rules that will allow experimentation with new business models and products by exempting certain companies from some requirements. In addition, the Minister introduced the Ontario FinTech Accelerator Office, which will help FinTech start-ups become established.[51] To further satisfy expert consulting demands, the OSC has interviewed for a FinTech Advisory Committee (FAC) that will advise the OSC LaunchPad staff on the development and challenges regarding the FinTech industry.[52]

Securities laws are not the only regulations FinTech firms must abide by. They must also take into consideration regulations for consumer protection, payment processing, anti-money laundering rules, and privacy and data security. For a comprehensive list of regulations, please refer to Gowling WLG.[53]

Consumer protection legislation regulates the commercial relationship between a FinTech firm and its customers. More specifically, it regulates credit agreements and imposes specific financial and cost of credit disclosure obligations on lenders for fixed credit, open credit and credit cards. Online lending platforms should pay extra caution to the consumer protection requirements on their lending practices, credit disclosure requirements, and caps on interest rates and fees they may charge.[54]

51 *Richard Corley, Allan Goodman, Connor Spelliscy, (2017), "" A Regulatory Super Sandbox" – Ontario Finance Miniter Announces Eased Regulations for Financial Startups", Goodmans LLP*

52 *The IIJ Staff, (2017), "OSC seeks applicants for Fintech Advisory Committee", The Insurance and Investment Journal Press Group*

53 *Neil S. Abbott, (2016), " Fintech Companies: What are the Key Laws and Regulations you need to follow?", Gowling WLG*

54 *Dentons, (2017) "Regulation of Fintech in Canada"*

The existing regulation over payment processing is not directly applicable to FinTech firms. Currently, payment rules and standards are established under the Bank Act which is overseen by the Office of the Superintendent of Financial Institutions (OSFI). OSFI only oversees federally-regulated financial institutions (FRFIs) and not the services they provide therefore FinTech payment providers are not subject to OSFI oversight. However, FinTech firms in the payment process should be aware of the standards set out by Payments Canada such as the Code of Conduct for the Credit and Debit Card Industry in Canada.[55]

Anti-money laundering rules include the Proceeds of Crime (Money Laundering) and Terrorist Financing Act, which requires firms involved in foreign exchange and remittance or fund transfers, securities dealers, portfolio managers and investment advisors to verify their clients' identities, keep records on their clients and report any suspicious activities to the Financial Transaction and Reports Analysis Centre of Canada (FINTRAC). Online money transfer services, robo-advisors, crowdfunding platforms, lending platforms and digital currencies may all have to comply with these requirements.[56]

Finally, privacy and data security are governed by the Personal Information Protection and Electronic Documents Act (PIPEDA) which establishes how private firms may collect, use, and disclose personal information for commercial activities. Under PIPEDA, clients must give their consent before their personal information is collected, used and/or disclosed. Firms must have adequate security in place to ensure that personal information is well protected.[57]

55 *Ibid Dentons, (2017) "Regulation of Fintech in Canada"*

56 *Ibid Dentons, (2017) "Regulation of Fintech in Canada"*

57 *Ibid Dentons, (2017) "Regulation of Fintech in Canada"*

Looking to the future, open banking, which is now being implemented and regulated in some parts of the world, may make its way to the Canadian market. The UK, for one, has just put in place open banking requirements for its nine largest banks.[58] Open Banking is a direct data sharing service that allows third parties to build applications around financial institutions' data.[59] Although this technology has not yet been adopted by most Canadian financial institutions, regulators have begun to discuss its potential risks and implications and to consider regulations that might be needed in the future.

The current regulatory landscape in Canada is quite fragmented and complex. Ultimately, it is up to the firm to determine what legislations and regulations they must abide by. Luckily, Canada has increased its resources for advice in determining what laws are applicable to a firm and what exemptions they may be privy to.

58 Oscar Williams-Grut, (2018), *"An invisible banking reform that 'could fundamentally change how we manage our money' is days away", Business Insider*

59 *MuleSoft, "What is Open Banking?", Cited on January 15, 2018*

CONCLUSION

Canada's FinTech landscape has grown dramatically in recent years. In future, collaborations between FinTechs and traditional FIs, new and improved regulations, leadership in the financial services space, and access to top talent will all play crucial roles in the continued success of FinTech in Canada.

Canada's funding landscape, although small compared to US and UK, is well established and continues to grow. Relative to the size of its economy, Canada's FinTech funding is substantial and continues to grow. However, large one-off investments, often driven by investments from traditional FIs that are seeking to collaborate with FinTechs, have made this funding especially volatile.

FIs have not only found it useful to collaborate with FinTech firms, but also to invest in accelerators in order to gain access to top talent. The birth of accelerators and incubators across Canada are further aiding the development of FinTech firms by providing FinTech firms with services such as expert advice, networking opportunities, and direction within the regulatory landscape.

Regulation may be the largest constraint to FinTech development in Canada, as we have not set out many of the same principles as in the US and UK. This however, is improving with the launch of the OSC Launchpad and CSA Regulatory Sandbox. Canadian FinTech companies are being granted periodic exemptive relief to allow businesses to test out their frameworks and make improvements where necessary.

Evidently, Canada has established many initiatives to become a leader in the FinTech space. With Toronto being one of the top financial hubs in the world, and Canada possessing some of the top technology schools in the world, it comes at no surprise that we are well on our way to becoming a FinTech leader.

Stay tuned!

The rise of FinTech can easily be attributed to the countless opportunities it has and will continue to bring to its users. FinTechs not only have the ability to enhance services for existing customers, but may also provide the opportunity to bring financial services to individuals who may not have had access before. However, as we know in finance, there is no such thing as a free lunch and FinTech opportunities come with their own set of risks, while, in some cases, exacerbating existing risks. To address these issues, GRI will be releasing a follow-up report highlighting the risks and opportunities of Fintech to traditional financial institutions as well as to the financial system as a whole.