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# FinTech in Canada

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## Participating Stakeholders



Approximately 30% of the stakeholders who participated in the FinTech Report elected to do so without attribution.

## Foreword



FinTech is a growing sector in B.C.'s vibrant tech industry, boasting startup and established FinTech companies that illustrate how this rapidly evolving field is creating opportunities for B.C. entrepreneurs to innovate, creating increased financial choice for consumers and further growing our economy. To support this emerging sector, the BC Tech Association opened up B.C.'s first FinTech Hub this past October, to encourage and support companies that are developing innovative approaches to financial services.

This level of success sends a clear message that B.C. remains at the forefront of ingenuity as we continue to lead technological innovations, which are reflected in FinTech companies established in British Columbia. In a time when people use their smartphone or their wristwatch to pay for their morning coffee, new innovations provide alternative methods to traditional methods of banking – from peer-to-peer money transfers to alternative lending options.

Through industry consultations, we learned that our government can help B.C.'s tech sector to remain a driving force of economic growth. Our recently released #BCTECH Strategy, which includes a \$100 million BC Tech Fund for promising tech companies, will strengthen and expand our already successful tech industry through three commitments: improving opportunities to access capital, deepening our talent pool and opening access to markets overseas and here at home.

B.C. is quickly turning into a major tech hub, with worldwide appeal and the three T's – talent, taxes and time zone – which give us an advantage over other jurisdictions. British Columbia is where tech leaders want to be.

Our #BCTECH Strategy and our support for innovation across all economic sectors will ensure that we continue to build a strong and thriving economy that generates jobs for British Columbians. Our quality of life and wealth of talent uniquely positions our province for this sector's success and creates a desirable atmosphere for many companies to lay a strong foundation for their future.

**Honourable Amrik Virk**  
Minister of Technology  
Innovation and Citizens' Services  
Government of British Columbia

## Canada's FinTech Opportunity



The purpose of this FinTech Report is to present a vision to position Canada, and in particular Vancouver, as a global hub for FinTech, joining the existing league of the FinTech cities of London, New York and Singapore. Positioning a city as a FinTech hub requires being able to attract the attention of international investors and businesses looking for the right place to invest. Not surprisingly, year after year, Vancouver is consistently voted among one of the top cities in the world to live, and one of the best cities in the world to do business.<sup>1</sup> It attracts a great number of international corporations and organically incubates hundreds of startups annually who bring employment and investment opportunities for all British Columbians. Vancouver is in an ideal position to be a leading FinTech centre because it has a FinTech niche, many leading tech companies, including Microsoft, Electronic Arts, Amazon and D-Wave, and leading FinTechs such as Samsung Pay and SAP, as well as a number of national FinTech key players, including the new FinTech Association of Canada, that are working inclusively to establish a common foundation on which to build a FinTech hub.

In addition to tech leadership, Vancouver has a number of other leading business clusters that support sustained and diverse growth and complement FinTech, such as the gambling industry and the film industry, both of which develop advanced tech to move their industries forward. Vancouver also has strategic alliances and cultural ties with Asia and the Middle East that are vital for international trade.

FinTech matters to Canada because FinTechs are rapidly gaining an increasing piece of the traditional financial services market. Key drivers behind the growth of FinTech are digitization, the expansion of technology innovation and the demands of Millennials for frictionless mobile solutions in financial services. Investment in the FinTech sector is exploding. In 2014, investment from private capital in FinTech companies was US\$12.21 billion, an increase of 201%, compared to 2013.<sup>2</sup> In 2015, FinTech investment grew 75% to US\$22.3 billion, and over 1,100 FinTech deals were announced. In

2016, capital markets spending in technology and services will exceed US\$225 billion worldwide.<sup>3</sup>

In addition to the explosion of investment in FinTech globally, there has been a corresponding explosion in the number of new technology entrants in FinTech, combining innovative business models and technology to disrupt and enhance financial services. There are approximately 12,000 FinTech startups, and the number keeps increasing monthly. Investment in FinTech is important: it helps launch and sustain thousands of new startups, drives innovation in science and technology and creates employment growth in new and emerging cutting-edge sectors.

The disruption caused by the emergence of FinTech has the capacity to completely transform financial services in Canada. The combination of mobile services, automation and artificial intelligence will eliminate thousands of physical bank branches, tellers and large segments of financial services currently performed in person and by persons in Canada. Financial services will be increasingly provided online and as a result the financial services sector will be increasingly staffed by software engineers, techs, developers, IT specialists, intelligent machines, robo-advisors and digital officers, rather than with front line customer service and back office employees. Employment in traditional financial services roles is expected to shrink dramatically, and the effects are already being felt, with major national and international banks announcing technology driven layoffs in recent years. The Bank of Montreal recently announced it was eliminating 1,850 jobs because of tech, i.e. FinTech. Further afield, the Royal Bank of Scotland recently announced it was eliminating 550 jobs and replacing them with robo-advisors.<sup>4</sup> Less than a month later, RBS announced it was closing 32 branches and cutting an additional 600 jobs.<sup>5</sup> Thus far in 2016, Lloyds has cut 1,775 jobs and Barclays estimates it will eliminate between 26,000 and 66,000 jobs in financial services.

Traditional financial centres must adapt; banks may need fewer office towers and more IT centres and open co-working spaces for developers aligned with the top universities in science and technology. There is a major opportunity for any location, and

particularly Vancouver, to emerge as a new financial technology centre.

Banks are under pressure to deliver financial services that are simple, wearable, secure, affordable, mobile and fast to customers. Banks that do not innovate to meet those customer demands are expected to lose 10% to 40% of their revenues by 2025 in wealth management, consumer finance, mortgages, lending to SMEs and retail payments, as FinTechs step in and force down prices and squeeze margins.<sup>6</sup> Goldman Sachs predicts that US\$4.7 trillion in revenues from financial services is at risk of being displaced by FinTechs. Heather Cox, CEO of CITI FinTech, believes FinTechs will pick off banks, one service at a time. “Unless we change the trajectory,” she said, “35% of the revenue model will be gone in five years”.<sup>7</sup>

The aim of this FinTech Report is to provide thought leadership that changes our trajectory so that Canada becomes an international leader in FinTech. Some countries have a FinTech national strategy that, among other things, directs investment in national FinTech growth and supports international initiatives for domestic FinTechs in an inclusive manner (See “FinTech in Other Countries”, p. 18; “Stakeholder Views”, p. 32). Based on the findings in this FinTech Report, it appears that what Canada may need is a government funded FinTech centre that showcases Canadian FinTech talent, financially supports inclusive innovation and helps Canadian startups to create innovative financial technology that the world buys, rather than the reverse. Economically, such a FinTech centre would be highly worthwhile. The global FinTech market is still largely untapped and worth US\$13 trillion, equal to 17% of global GDP.<sup>8</sup> We are clearly at a crossroads with FinTech – there is not only a lot at stake for Canada but equally, there is a massive global opportunity awaiting us, especially in Vancouver. British Columbia is well-positioned to capitalize on this untapped market if we step up and seize the opportunity.

While this FinTech Report focuses on Vancouver, British Columbia, it is very much both a Canadian and an international view of the FinTech landscape. We believe this is the first FinTech report researched and written entirely by a team of lawyers from several law firms and the first FinTech report to provide an overview of the FinTech ecosystems in 16 countries. We believe this may be the first

time the FinTech ecosystem of certain countries have been reported on internationally.

A lot of work and effort goes into preparing an international FinTech report and we are grateful for the insightful contributions of our stakeholders and contributors, without whom this FinTech Report would not have been possible. We are also grateful to the Honourable Amrik Virk, Minister of Technology, Innovation and Citizens’ Services, of the Government of British Columbia, for preparing the Foreword of this FinTech Report.

The FinTech space in Canada and in Vancouver faces an exciting opportunity ahead, including our founding membership in the Global FinTech Hubs Federation – an international network of cities that fosters innovation across the world’s financial services industry and aspires to facilitate trade and investment in Canada in FinTech. At Sibos on September 28, 2016, the Digital Finance Institute will present the vision for Vancouver and for Canada as a FinTech leader before the world’s banking community, helping to solidify brand awareness for all of our FinTechs.

We invite you to join us to continue the dialogue of making Canada a global FinTech leader.



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## Executive Summary



This FinTech Report is a first in many respects. It attempts to survey the popular question of “What is FinTech?”, along with a comparative study of the international FinTech landscape in 16 countries (See “FinTech in Other Countries”, p. 18), an assessment of the law in Canada relevant to FinTech, and a stakeholder survey of issues critical to the ecosystem, all with a view to identifying the strengths, challenges and opportunities for Canadian FinTech.

In compiling this report, it was apparent that Canada has the key ingredients, or the secret sauce, so to speak, for FinTech success and international leadership. We have a strong and stable financial system, anchored by major national banks that have been at the forefront of customer-focused financial innovation for decades and consumers that are savvy about financial services. We have a rapidly expanding cohort of financial innovators finding novel and nimble ways to enable more efficient, frictionless and accessible financial services. We benefit from a business-friendly environment, with leading universities, strong tech talent and favourable government programs. We reside at a nexus between key Asian and international markets, and close proximity to the sophisticated investors and huge market opportunities in the United States. Each of these factors is crucial to the success of Canadian FinTech, and achieving the goal of Canada as a global FinTech leader and exporter of leading financial technology. The questions worth considering are what are the next steps and how do we find the best path forward to maximize the success of Canadian financial innovation?

In consulting with stakeholders, advising FinTech and financial institution clients, and participating in the national and international FinTech initiatives that are underway, it is evident that this is a very exciting time for FinTech; investment in FinTech reached a peak in 2015 and appears poised to hold steady for 2016 notwithstanding current economic uncertainty, and partnerships, co-innovation and corporate investment in FinTech is at an all-time high. There is a sense that we are on the cusp of revolutionary changes to how

traditional services, be it financial, legal, insurance or otherwise, are delivered. Technology and innovation present an immense opportunity for those in traditional service industries. We undertook this report to help Canada capitalize on its FinTech opportunity.

As lawyers, we have a unique perspective on the FinTech sector. We are a business advisor, advocate, and often the gatekeepers of financial systems. Given the international scope of our clients’ activities, we often have the benefit of a global perspective. FinTech, more so than many industries, is greatly influenced by the legal regime in which it is developed, and therefore the laws and regulations of Canada will have a significant impact on the development of Canadian FinTech and for this reason we have included legal perspectives throughout this FinTech Report and devoted a section to the law (See “FinTech Law” p. 15). Lawyers have an important role to play in advancing Canadian FinTech, and in the case of this FinTech Report, we aim to offer thought leadership and a forum to highlight our current successes and strengths, in pursuit of advancing Canadian financial innovation. Of course, it should be noted that nothing in this report constitutes legal advice.

This FinTech Report was a collaborative and inclusive process. We invited FinTechs, banks, government agencies, tech firms, law firms, advisory firms, universities, VCs and industry associations to participate. Over 100 firms participated in this FinTech Report, which is reflected in the views of FinTech stakeholders who shared their vision for what is needed to make Canada a leader in FinTech (See “Stakeholder Views”, p. 32).

This FinTech report represents the work of its individual authors and a significant number of contributors, and should not be construed as representing the views of the organizations to which such persons belong, unless specifically attributed.

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## Types of FinTech

So what is FinTech? The phrase “FinTech”, first coined by a New York banker in 1972, refers to the intersection of technology and financial services. While there is no accepted definition of what qualifies as a FinTech, companies considered to belong to that sector include payments, online marketplace lending, mobile apps, financing, foreign exchange and remittances, investments, Blockchain, distributed ledger tech, digital currencies, mobile wallets, artificial intelligence and robotics in finance, crowdfunding, insurance and wealth management, with an expanded definition considered to include ancillary technology solutions targeted at financial services, such as digital identity, biometrics, wearables and technology to assist with regulatory compliance (RegTech). This section of the FinTech Report provides an overview of some of the main areas of FinTech being developed in Canada and globally.

### Bank Innovation

FinTechs are not the only ones innovating. In fact, banks in Canada are the largest players in Canadian FinTech, many developing their own financial technology and innovation in-house.<sup>9</sup> In 2015, banks in North America spent US\$62.2 billion on external IT and that number is expected to increase in 2016 to US\$64.8 billion,<sup>10</sup> surpassing half a trillion US\$ globally in 2017.<sup>11</sup> For core processing alone, banks will spend an estimated US\$35 billion in 2017.<sup>12</sup>

When banks invest in their own FinTech in ways that are creative and responsive to the market, the result can be impressive. For example, China CITIC Bank, a global bank based in China, recently won a “Best FinTech” award for its WeChat Pay, the first app to combine banking services, payments and social media with borderless banking and wealth management services at a customer’s fingertips.

While banks are, and have always been, investing in innovation in financial technology, their innovation has, at times, been constrained due to large organizational structures, regulatory regimes, the realities of competing priorities and the sheer size and scale of their

business operations. Risk appetites are unsurprisingly lower in banks than at a FinTech startup and while banks have implemented large scale innovation projects, tolerating failure, often a crucial ingredient for creativity and innovation, is challenging for banks.<sup>13</sup> The innovation challenge at big banks is multi-faceted, as are its solutions but experts have suggested that solutions include, among other things, thought leadership, having technology talent in senior positions and engagement of external people to lead innovation.<sup>14</sup> To address this, banks in the EU and Asia have led the way in setting up, or financially supporting, FinTech accelerators and incubators where new startups get the hands-on institutional guidance and support they need to launch to market. Well-known examples include Level39, Europe’s largest FinTech accelerator and the FinTech SuperCharger in Hong Kong. Others, such as UBS and BBVA, have global FinTech competitions to support external FinTech development.

Canadian banks are creating innovative solutions for banking and adopting new digital technologies to enhance the customer experience. As just one example, Royal Bank of Canada both creates FinTech in-house with developers in Orlando and Silicon Valley and also externally as part of the US-based R3CEV, a blockchain technology consortium investigating tech solutions for future uses of the Blockchain, which recently filed for its first patent for its distributed ledger platform.<sup>15,16</sup>

Banks have some competitive advantages over FinTechs, including capital, brand recognition, reliable services, as well as established customer relationships, customer trust and loyalty. Banks are supplementing these advantages by collaborating with FinTechs to reach new customers, or offering a wider variety of flexibility and products to their customers on a more cost-effective basis.

Financing or partnering with competently managed FinTechs often gives banks the innovative tech talent they need. Partnerships with banks helps FinTechs as well, which often lack the national reach, financing capability, experience and regulatory knowledge to translate a solution into a viable vehicle for long-term growth.

Partnering with the banks also gives FinTechs access to the underlying payments infrastructure they need and a banking partner to get to market. In all, partnering can be a win-win for both parties. TD Bank, for example, recently partnered with Moven, a US-based mobile personal financial management platform. CIBC launched a referral partnership with Thinking Capital, a Montreal-based online SME lender, and Scotiabank co-invested in Kabbage, a US-based FinTech that offers SME lending.

Globally, central banks and government agencies play a role in developing and funding FinTechs as well. Singapore's central bank led the way with the formation of a \$225 million "Smart Financial Centre" to support FinTech (see "Singapore", p. 20), and the Bank of England recently announced it was financially supporting a FinTech accelerator in London.<sup>17</sup> The FinTech SuperCharger in Hong Kong was financially supported by the Hong Kong Stock Exchange and Invest HK.

## Robo Advisors & Wealth Management

Tech-savvy consumers, especially Millennials, are increasingly looking for mobile and simplified ways to obtain financial information to control their finances, and make financial decisions, especially in wealth management. There are many FinTech solutions providing wealth management tools, including personal finance management apps, financial recommendation tools and budget and credit management tools.

Robo-advising services are shaking up traditional wealth management. They offer machine-generated investment advice at a lower cost than traditional financial advisory services and promise objective, data-driven advice where and when customers want it. Robo-advisors such as Betterment LLC, Wealthfront and Personal Capital have attracted hundreds of millions of dollars in venture capital. Robo-advisory solutions have also caught the eye of large investment firms such as BlackRock, which acquired FutureAdvisor after it had attracted \$600 million in assets under management.

Some established financial institutions are building their own solutions, seeing FinTech solutions in the area of investment algorithms as complementary products to existing offerings. For

example, Charles Schwab launched Schwab Intelligent Portfolios, a free robo-advisory service with low account minimums. Vanguard, a US-based company, launched its own service called Personal Advisor Services, which offers a hybrid between robo-advisory services and traditional financial advising and has \$17 billion in advisory assets. Other established financial giants have partnered with FinTechs, although not always successfully; in late 2015 after a year-long partnership with Betterment LLC, Fidelity Investments decided to wind down the partnership, citing lack of traction with its clients<sup>18</sup> and is now testing its own "Fidelity Go" solution.<sup>19</sup>



The combined impact of standalone FinTech wealth management solutions and robo-advisory services offered by traditional investment businesses is potentially significant. It is estimated that robo-advisors will manage \$255 billion in assets by 2019.<sup>20</sup> To illustrate, Betterment LLC went from 50,000 customers and US\$1.1 billion in assets under management in 2015 to 150,000 customers and US\$3.9 billion in assets under management in 2016.<sup>21</sup>

Many experts believe that artificial advice, or artificial intelligence, is going to be better at providing financial advice to customers than humans, proving to be the most significantly disruptive force to the financial services industry (see "Artificial Intelligence", p. 10).<sup>22</sup> Canadian FinTechs have begun to offer consumers digital wealth management tools that compete with traditional financial advisory services. While smaller than many international FinTech markets, the Canadian market has at least a dozen companies offering digital portfolio management solutions.

In Canada, financial advisers have traditionally been required to be registered to provide services and are required by law to ascertain

and verify the identity of their customers as well as determine suitability of an investment. As such, pure digital-only robo-advisory services can be a challenge in Canada but a number of lean hybrids have entered the market, and recent regulatory developments in respect of identification standards may create more flexibility for this FinTech segment.

Wealth management solutions in the Canadian FinTech space include Nest Wealth, Smart Money, ShareOwn, Wealthsimple and WealthBar, all of which offer robo-advisor style digital portfolio management services to varying degrees. Some are seeing impressive investment. For example, Power Financial Corp. recently invested a \$10 million tranche in Wealthsimple,<sup>23</sup> a Toronto-based FinTech.

Canada's banks are also considering robo-advisory services. In January 2016, Bank of Montreal became the first to launch a robo-advisory service with the introduction of SmartFolio, an online portfolio management service built in-house with assets of \$20 billion managed by a small team.<sup>24</sup>

As with the impact of technology on traditional banking, innovation in wealth management and robo-advisory type services will undoubtedly have an impact on traditional wealth management firms. The Royal Bank of Scotland recently announced it was terminating 550 financial advisors and related positions, replacing them with robo-advisors to meet customer demands for non-face-to-face advice.<sup>25</sup> The rise of technology-based financial advisory services will clearly have an increasing impact on traditional human-based advisory services and transform the delivery of financial services.

## Payments

In Canada, the payments sector is growing quickly, and has been a particular area of growth focus. In 2015, the value of the mobile payment transaction market grew 210%. In 2015, mobile payments totalled US\$8.71 billion in the US, with users spending an average of nearly US\$376 annually using their mobile phone as a payment method. By 2016, total mobile payment transactions will reach US\$27.05 billion, with users spending an average of US\$721.47 annually.<sup>26</sup> Seventy one percent of banks believe the impact of

payments will be high or very high, especially in respect of mobile P2P and mobile wallets.<sup>27</sup> According to a recent study, in 2014, 21% of Canadians made at least one online payment in the past six months, compared with 83% in China and 33% in the US.<sup>28</sup> Millennials are leading the growth in payments, frequently using their smartphones to make mobile payments of all kinds. Globally, however, experts believe that the payments space is crowded and the growth potential may not exist for new entrants.<sup>29</sup>

Banks are by far the biggest players in payments, followed by payments processed by tech giants such as AliPay, Apple Pay, Samsung Pay, UnionPay and PayPal and traditional payment networks such as Visa and MasterCard. Interestingly, Starbucks, a closed loop prepaid provider, is the largest retail mobile payment network in the US.<sup>30</sup> In recent years, the payments industry has been transformed by innovation, including with the introduction of payments through near-field communications (NFC), or "contactless" payments, which require that the payment device be in close proximity to the reader and operate through an integration of hardware and software. Over 70% of credit cards and 40% of debit cards support NFC payments.<sup>31</sup>

The FinTech payment sector in Canada has many innovative companies including Moneris, a bank-owned merchants payments platform, VersaPay, a Vancouver-based FinTech that services payments in the US, UK and Canada, TIO Networks, a Vancouver multichannel bill processing FinTech,<sup>32</sup> and Payfirma, a Vancouver FinTech that developed a merchant payment platform that combines several payment options on one platform.<sup>33</sup> Hyperwallet has multi-product payments solutions serving businesses, financial institutions and marketplace.<sup>34</sup> Other payment FinTechs include Dream Payments, a Toronto-based FinTech with a mobile point of sale solution for retailers, and Carta Worldwide, an Ontario-based company, which enables contactless payments on smartphones. Toronto-based Soundpays, provide tech to send payments via sound waves.<sup>35</sup> RentMoola, a Vancouver-based FinTech, offers a rent-based payments system to its customers. Niche payment apps, such as US-based Tilt, target specific sectors of consumers with a global reach by providing payment services to university students that are integrated with social media channels.<sup>36</sup> Toronto-based BitGold, now called GoldMoney, is a hybrid payment FinTech that allows customers to buy gold and use its value as a payment mechanism.

Other startups in the payments space are adopting a “bank-lite” model which is based around a prepaid debit card linked to a mobile phone app. These companies provide an alternative to conventional bank accounts with a limited service. An example is Vancouver-based Koho, which provides a mobile alternative to a traditional bank account.<sup>37</sup>

In addition, Vancouver is home to the R&D facilities of Samsung Pay, a global smartphone payments provider. Samsung Pay is different from Apple Pay and Android Pay because merchants can accept payments using their existing credit card terminals and do not need NFC technology.

The Province of British Columbia is also a leader through its PlayNow.com platform, operated by the British Columbia Lottery Corporation. PlayNow.com was the world’s first regulated online gambling platform that accepted deposits for bets for a variety of games and processed financial transactions with tech that incorporated payments with financial crime mitigation, and identity verification in a manner that protects the integrity of the province’s gambling sector and exemplifies “responsible innovation”.

In the payments space, Vancouver is very much a FinTech leader on par with other FinTech hubs elsewhere in the world, and is the leader in provincial government payments in the regulated gambling sector.

## Remittances

The remittance of money from established or new immigrants to their families in their countries of origin plays a significant role in the world economy, reducing the level of poverty around the world, improving human capital accumulation and increasing both small business investment and entrepreneurship. In 2015, global remittances totalled over \$600 billion with the top recipients being China, India and the Philippines.

Every year, billions of dollars in remittances are transferred between countries. In 2013, migrants from developing countries sent home US\$414 billion and in 2016, that number could reach US\$500 billion.<sup>38</sup> In 2012, migrants in Canada remitted \$24 billion, according to the latest data available, and they sent more dollars per capita in

remittances than almost any other nation, including the US and the UK.<sup>39</sup> Migrants around the world pay large fees, on average 7.7%, to send money home – a number which, if reduced to 5%, could give them an extra \$14 billion a year to use for buying goods and services in Canada.<sup>40</sup>

FinTech is likely to transform the remittance sector fairly quickly. Online products are the cheapest way to spend money: while (physical) account-to-account transfers add an extra 10.86% to the total cost, online products only add 5.57% on average.<sup>41</sup> FinTech startups disrupt the traditional market with transfers that are not only cheaper but often easier and more convenient, as customers can often effect transfers with the click of a button instead of physical visits to a bank branch.<sup>42</sup> Remittance FinTechs are unsurprisingly common in global hubs like Singapore and London, which are home to a large number of thriving FinTechs and a large number of migrants.<sup>43</sup>

Although 90% of remittances occur offline, the online remittance market is growing and has untapped potential. Some traditional banks are collaborating with FinTechs, or adopting FinTech to allow customers to improve the remittance experience.<sup>44</sup> Venture capitalists have also invested heavily in remittance FinTechs. Although a total sum is unavailable, one survey shows that venture capitalists invested over \$338 million in 12 remittance startups.<sup>45</sup>

The regulatory landscape in Canada for remittances could soon change, as the federal government and some provincial governments have expressed an interest in expanding access to lower-cost remittances and potentially introducing additional protections for remittance customers.

In Canada, remittance customers seem to prefer home grown remittance companies, especially in Western Canada. Vancouver-based FinTechs have well-developed services to facilitate remittances from Canada to other countries. nTrust enables customers to transfer money via mobile, tablet or desktop platforms, and offers free money transfers within Canada, free domestic money transfers within Australia, the EU, and the UK, and transfers money between members or directly to bank accounts from those countries or the Philippines to the rest of the world.<sup>46</sup> The remittances market is particularly significant for Vancouver because of the high

percentage of residents who are foreign born,<sup>47</sup> and the growing volume of remittances from Vancouver to Asia.

## Digital Currencies, Blockchain & Distributed Ledgers

Consumer payments and ways of transferring value in Canada and globally have shifted over the last several decades from paper-based media, such as cash and cheques, to card-based media such as credit and debit cards, electronic methods such as pre-authorized payments through ACH, and more recently, digital methods such as digital currencies.

A digital currency is a digital form of a monetary (or non-monetary) instrument with a bidirectional flow, meaning it allows users to both buy and sell, or use, the digital currency.<sup>48</sup> Bitcoin is the most popular digital currency. It operates peer-to-peer and machine-to-machine (M2M). Unlike traditional fiat currencies that are issued by national governments and controlled by central banks, Bitcoin has no central monetary authority and is not backed by any central bank, authority or government. The supply of Bitcoin is not controlled by any central governmental authority, and it is not legal tender in any jurisdiction.<sup>49</sup>

Users can buy digital currencies in person, at an ATM or online with real monetary instruments and use them to buy goods and services globally or to transfer value.

The transactions for goods and services bought or sold using digital currencies are not processed through a centralized authority, or clearing house. A Bitcoin transaction is processed through the Blockchain, which acts similarly to a third party clearing house except that the clearing (or reconciliation and verification of transactions) component is entirely M2M on the Blockchain (i.e., direct). Cryptographic software validates each transaction through a process referred to as mining where participants compete to make records by solving computationally complex cryptographic problems. In the transactional validation process, transactions are time-stamped via a hash algorithm that was designed by the National Security Agency, which creates an ongoing chain, and a decentralized digital record (the ledger) that theoretically cannot be altered. A proof-of-work concept records the transactions

chronologically and publicly. The shared public distributed ledger is the Blockchain. The Blockchain is designed to prevent anyone from double-spending, and therefore using digital currencies they do not own.<sup>50</sup> As a result of the Blockchain, it is now technically possible to buy currency, shop for goods or services and remit value internationally almost instantaneously, purely M2M without the need for institutional middlemen.

By contrast, other online currencies or payment systems, such as bank credit cards, are indirectly settled – they involve a central administrator or financial institution middleman that sits between the transacting parties. These intermediaries validate and reconcile transactions to avoid double-spending.

At the initial peak of Bitcoin's popularity and value, prior to the meltdown of the Bitcoin exchange Mt. Gox in February 2014,<sup>51</sup> Canadian consumers appeared ready to bring Bitcoin into the mainstream economy. Vancouver was home to the world's first Bitcoin ATM, installed in 2013, allowing users to exchange cash for Bitcoin.<sup>52</sup> As of June 15, 2015, Canada had 60 Bitcoin ATMs, second only to the United States, which had 120 as of that date—and significantly higher on a per capita basis.<sup>53</sup> As of October 2014, there were reportedly 64,000 merchants accepting Bitcoin payment around the world when the exchange rate was US\$300. There are now significantly fewer Bitcoin merchants.

Many private distributed ledgers have recently been launched. The two most well-known are Ripple Labs and Ethereum.

Ripple Labs, a US-based company, created the Ripple consensus ledger, and its own digital currency, called Ripples. It provides a private solution to move digital currency for parties, and conducts the currency exchange function from digital currency to real monetary instruments as part of its transactions. Ripple is the second largest digital currency after Bitcoin and unlike the latter, it is pre-mined. Last year, Ripple was subject to the first enforcement action in the US involving a digital currency and distributed ledger company in respect of anti-money laundering law issues in its early days.<sup>54</sup> Ripple has grown rapidly and on June 21, 2016, was used as the digital currency vehicle for the world's first direct bank-to-bank transfer of real money when \$1,000 was transferred from Canada to Germany in a matter of seconds.<sup>55</sup>

Another digital currency and distributed ledger initiative, Ethereum, was started in Toronto but relocated to Switzerland. Ethereum is a programmable distributed ledger which allows users to code their own case uses of any complexity, serving as a platform to enable creation of many different types of applications. Ethereum is known to enable the creation of so-called “smart contracts” which are arrangements established by computer code whereby, upon the fulfillment of conditions precedent, certain action is taken, such as release of payments in a digital currency held in escrow to a contracting party.

Potential applications of smart contracts include the possibility of creating invoices that automatically execute a payment when a shipment arrives or the issuance of dividends which are automatically paid to shareholders if corporate profits reach a certain level.

There is a much broader set of potential applications for distributed ledger technology beyond the payments industry which are significant for FinTech. A distributed ledger operates as an online ledger where all the validated transactions that are processed through it are recorded, linked, and can be traced.

In some respects, the distributed ledger is like a public database of all of a bank’s transaction records for every financial transaction completed by a customer. If a person’s wallet address is known, anyone can view the history of their financial transactions. If wallet addresses were eventually not anonymous, a common distributed ledger may be a perfect counter-terrorist financing and anti-money laundering tool for law enforcement because it is a permanent depository of evidence in the legal sense. It may revolutionize not only the banking sector, but equally the role of law enforcement and financial transactional reporting.<sup>56</sup>

Canadian financial institutions have shown interest in various applications of distributed ledger technology.<sup>57</sup> Most large Canadian banks have joined together to use US-based R3CEV to develop applications for banking on a permission-based system.<sup>58</sup> Canadian banks are beginning to consider Blockchain technology for a wide range of applications. Such technology could allow banks to transact directly with one another, eliminating financial middlemen that verify cross-border transactions. Some Canadian banks are experimenting

with Blockchain’s ability to administer loyalty programs or internal rewards systems programs in order to test out the technology.<sup>59</sup>

Interest in new and potentially disruptive applications of Blockchain technology in Canada is high. Non-banking companies are beginning to create tailored uses of Blockchain technology. A large corporation recently announced that the SEC has approved its plan to issue shares using Blockchain. Nasdaq is building a private stock exchange using Blockchain, and major investment banking firms are investing in Blockchain startups to help them manage their assets digitally.<sup>60</sup>

The FinTech potential for distributed ledger technology has room to expand in Canada, especially in the Internet of Everything space where M2M payments will be key.

## Investment & Asset Management

FinTech companies are playing a fundamental role in re-thinking traditional modes of investment and asset management, broadening the investment opportunities available to investors.

Lending Club and Funding Circle have created alternative sources of debt financing for businesses, enabling them to borrow from investors rather than financial institutions. As these platforms become more refined and well-used, credit scoring and vetting of potential investments is becoming more advanced and opportunities for investors to diversify are growing.

FinTech solutions are not just benefiting novice investors, but also brokers and sophisticated angel investors as well. While traditionally brokers rely on their existing client lists to identify potential investors, web-based companies, such as AngelList, provide opportunities for brokerages to reach a broader spectrum of potential investors, and for angel investors to collaborate as part of syndicates. Recently, AngelList had its first billion-dollar exit when Cruise Automation, an automotive technology company, was purchased by General Motors.<sup>61</sup> Cruise Automation had raised funds from a range of institutional investors, but its investors also included syndicates put together through AngelList.

Other ways FinTech companies are transforming investing are through enhanced tools for financial modelling and analysis, alternative trading systems, and implementing trading strategies. For example, eToro enables investors to follow selected investors to see – and, if desired, mimic – the trades they make. Other FinTech platforms are mining data from social platforms to gauge public sentiment about various investments in an effort to better predict their movements.

Canadian FinTech companies are changing the ways that Canadians invest their money, offering new ways for companies to connect with investors and for investors to access investment opportunities that would not have been available to them through traditional investment channels.

Vancouver-based Voleo offers a mobile platform that enables users to invest collaboratively by forming investment clubs and pooling their funds. Club members can then share information and vote on trades. This approach aims to transform investing into a social experience.

Another Canadian FinTech bringing new options to the investment landscape is InvestX Capital, which created a platform to facilitate access to private equity for retail accredited investors, who can use the platform to invest in individual private equity deals at minimum investment sizes as low as \$2,500 – effectively applying a crowdfunding model to private equity deals. The InvestX Capital platform helps give investors access to private equity deals and companies access to a more diverse and wider base of potential investors.

Similarly, FrontFundr, a Vancouver-based FinTech and an exempt market dealer registered to distribute securities, created a funding portal that gives experienced investors and the public access to investments in early-stage companies.

The asset management space, however, has been relatively slow overall to adopt FinTech. According to one report, that is because asset managers tend to be relatively ingrained in traditional practices.<sup>62</sup> In preparation for the next generation of younger asset management CEOs, American companies say they are spending

upwards of US\$500 million on tech for R&D on robot-advisors for asset management for institutional clients.

## Online Marketplace Lending

A number of FinTechs have focused on the online marketplace lending space, in part capitalizing on post-credit crisis demand from SMEs or non-traditional borrowers. These FinTech lenders are typically non-bank online financial platforms that leverage technology to facilitate loans, often with a faster onboarding process and approval times. Online marketplace lenders lend directly or indirectly to consumers and businesses.

Online marketplace lending permits the match of potential borrowers with potential lenders and tends to cater to consumers and SMEs that may be unable to obtain loans from traditional sources. Borrowers can request a loan for a specified amount through the platform, and investors on the platform can choose to lend to a particular borrower, based on information such as interest rates and credit scores. Some platforms are available to retail investors, while others are limited to institutional investors or banks. In addition, certain platforms may offer only term loans while others offer more sophisticated products, such as mortgages. They usually have faster access to credit, with shorter maturity terms without physical infrastructure (e.g., bank branch).

Over the past decade, online marketplace lending platforms have grown rapidly, predominantly in the consumer lending market. Over US\$100 billion in loans have originated globally using marketplace lending platforms and it is anticipated that the marketplace lending industry will continue to grow, originating between US\$281 billion and US\$532 billion worth of loans by 2020.<sup>63</sup> The US and the UK have mature marketplace lending platforms because they have well-developed credit systems that have allowed for quick evolution of local platforms.<sup>64</sup> There is a growing marketplace lending industry in China, driven by the lack of access to capital.<sup>65</sup>

Online marketplace lending platforms have grown steadily in the past three years in Canada, both as a result of successful US-based platforms expanding their operations to Canada, such as OnDeck, as well as homegrown startups launching following the success of such

platforms in other countries. Vancouver-based Grow, Amber Financial and Progressa, and Toronto-based Borrowell are examples of FinTechs in this space. In addition to the rise of online marketplace lenders, there have also been a number of FinTech entities that have launched balance sheet based lending services in Canada, including Montreal-based Thinking Capital. Mogo, a Vancouver-based online marketplace lenders completed its initial public offering and was listed on the TSX Venture Exchange in 2015.

In China, the US, and elsewhere, the sector is undergoing some regulatory scrutiny. In the US, Lending Club ran into legal issues, while in Canada, Lending Loop, a Toronto-based online marketplace lender, ceased processing loans on March 1, 2016 and stated it was consulting with the securities commissions.<sup>66</sup> In China, several online marketplace lenders have folded over financial crime concerns. The US Department of the Treasury is looking at requiring transparency in respect of online marketplace lending so that borrowers and investors alike have the availability of clearly disclosed information available prior to entering into a relationship with FinTechs in this space.

## Crowdfunding

Crowdfunding refers to the funding of a project or a venture through money raised from a large number of persons on an online platform. This form of funding has been growing at a fast pace in recent years, disrupting traditional funding models. Crowdfunding globally grew 167% in 2014, with US\$16.2 billion raised, up from US\$6.1 billion in 2013, and it was expected to have increased to US\$34.4 billion in 2015.<sup>67</sup> North America is the world leader in crowdfunding volumes, with the US representing the largest segment of the sector, but Asia is also emerging as a major crowdfunding region.

Today, there are thousands of crowdfunding platforms. Lending-based crowdfunding has quickly gained traction, although equity crowdfunding often receives significant attention due to its consumer-facing appeal. There are a number of additional crowdfunding models, including donation, reward, royalty and hybrid models. Crowdfunding is also not limited to business and entrepreneurship purposes, with social causes and performing arts also benefitting from dedicated crowdfunding platforms.

Indiegogo, founded in San Francisco in 2008, is one of the largest global crowdfunding platforms, and allows users to solicit funds for an idea, charity, or – as of 2015, following the US Securities and Exchange Commission’s approval of new rules allowing entrepreneurs to use crowdfunding sites to raise capital – a startup business.<sup>68</sup> Seedr is an equity-based crowdfunding platform which was originally part of an MBA project at Oxford’s Said Business School, officially launched in July 2012, and was recently named the UK’s most active crowdfunding platform, making 37 investment deals in the first quarter of 2016.<sup>69</sup>

Equity crowdfunding has high potential as a growth model but is impacted by securities laws because it involves the sale of securities, which also raises corporate legal considerations and the need for oversight to preserve the integrity of the capital markets. Canadian securities laws restrict companies in Canada from raising financing by issuing shares and other securities to the general public unless they file a qualifying prospectus or rely on an exemption from that requirement, which has historically limited the pool of potential investors for early stage businesses to friends and family, business associates and accredited investors, or required reliance on more costly offering memorandum exemptions to reach a broader investor group.

Canada was a relatively late adopter of crowdfunding regulations that allow startups to raise small amounts of capital by distributing securities to investors without filing a prospectus, which can be prohibitively expensive for startups and small companies and allow funding portals to facilitate trades of the securities without having to register as a dealer.

In 2015 and 2016, most provinces in Canada adopted some form of crowdfunding prospectus exemption, although various provinces have taken a slightly different approach. As a result of the differing regulations, including different caps on maximum amounts raised or invested, it can be onerous for companies to navigate the Canadian laws of equity crowdfunding.

As of February 2016, there were six equity crowdfunding portals in Canada operating under the startup crowdfunding exemption while additional portals have been authorized under the Ontario integrated

crowdfunding exemption which came into force in early 2016, many of which are now focusing on specific industry sectors.

The first Canadian equity crowdfunding financing closed in September 2015 for \$50,000 on the platform operated by Frontfundr, a Vancouver-based securities crowdfunding platform which connects investors with private companies in the early stage.<sup>70</sup> The Social Venture Exchange is an Ontario-based crowdfunding platform which targets accredited impact investors with social aims.<sup>71</sup> In addition to online equity platforms, a number of platforms offer debt financing, such as FundThrough and OnDeck. There are several non-equity crowdfunding platforms in Canada that cater to all types of interest groups including BC-based Chimp, Dream Bank and Fundrazr.

## Ancillary FinTech Artificial Intelligence, Wearables & RegTech

The FinTech space has spawned an explosion of tech that is ancillary to FinTech, meaning tech and data companies that support financial services but do not involve tech that moves money or involves financial transactions. Such tech is generally not currently subject to specific financial regulation or prudential concerns. Artificial intelligence is a prime example; while it is clearly now embedded in some financial services, it is also a standalone tech that supports financial transactions. Ancillary FinTech investment and growth is likely to outpace FinTech sub-sectors in the near future. This section of the Fintech Report provides an overview of the ancillary FinTech of artificial intelligence, RegTech, biometrics and wearables.

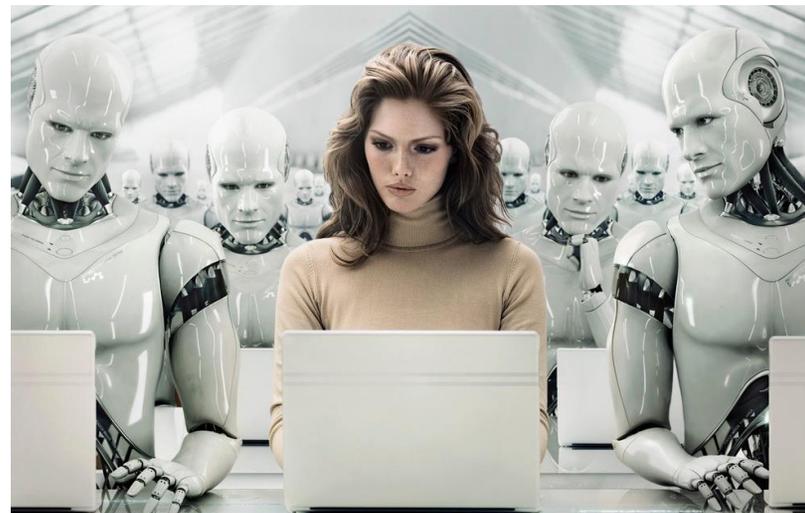
### Artificial Intelligence

Artificial intelligence (AI) is intelligence created by machines or software. The artificial intelligence and robotics market was worth US\$10.7 billion in 2014 and is expected to be worth US\$153 billion by 2020 and to have a disruptive impact of between US\$14 to US\$33 trillion.<sup>72</sup> The component for artificial intelligence alone (without robotics) is worth US\$70 billion. Artificial intelligence is expected to significantly impact financial services.

Globally, the areas where artificial intelligence could play a dominant role that involve FinTech are traditional financial services; autonomous vehicles; medicine (in bionics and autonomous surgeries); rehabilitation (in particular, for wearable robotics to help the disabled and elderly compensate for diminished capacity), and with carebots who assist the injured, disabled and elderly with mobility management. These areas of AI involve FinTech because, where they are consumer-facing, they will be connected to an autonomous payments system. AI services will not be free. For example, a self-driving vehicle that pays for parking or a carebot that helps the disabled to walk will have to be connected to a M2M payments system. The interaction between artificial intelligence and

FinTech presents an enormous opportunity for tech development and growth in Canada.<sup>73</sup>

The potential applications of artificial intelligence created specifically for financial services are varied, and include everything from credit scoring, analytics, customer service management, fraud detection, portfolio management, risk management,<sup>74</sup> financial planning, and evaluating spending patterns of customers for behavioural coaching.



Artificial intelligence is already enabling banks to use algorithms based on user behaviour patterns to predict transactional fraud, conduct money transfers and help customers in a number of different languages.<sup>75</sup>

Banks believe artificial intelligence can improve efficiency, cut costs, and make more efficient use of employee time and resources through the use of processing massive volumes of customer data held by banks and creating algorithms from it for machine learning capabilities. Despite having a small tech industry in comparison with

many other countries, Canadian companies have started to invest slowly in artificial intelligence R&D in financial services.

Many global tech firms, however, are deep in the artificial intelligence space including Apple, NASA, IBM, Google, Facebook, Microsoft and Samsung, the latter three of which have R&D or tech centres in Vancouver.

Although banks have been using some version of artificial intelligence in areas like fraud prevention and underwriting, they are now interested in next-gen technology and applying it in other areas, such as supporting financial advisors with software that predicts wealthy clients' future needs.<sup>76</sup>

Today's bank customers, especially Millennials, are less likely to enter physical bank branches, with many preferring instead to bank online or from a mobile device. In the banking sector, tech for machine learning applications is growing fast globally. For example, Santander Bank announced it will support customer financial transactions using voice recognition on its banking app, and Swedbank's artificial intelligence app already handles 30,000 customer conversations per month, resolving them 78% of the time.<sup>77</sup>

In Canada, Alberta-based Granify uses artificial intelligence to help online shoppers make targeted purchasing decisions.<sup>78</sup> In Hong Kong, startup Aidya launched a hedge fund that makes all of its trades using artificial intelligence with no human intervention at all. Its machines analyze market prices, trade volumes, macroeconomic data and corporate material, making market predictions and then executing on investments.<sup>79</sup> Other examples in financial services include California-based Wealthfront, which uses artificial intelligence to track customer activity and Venmo, which uses it to analyze customer spending decisions to provide customized advice.<sup>80</sup>

In India, one online bank, digibank, has begun to use artificial intelligence to provide virtual banking assistants that can converse with customers, eliminating human interaction in the banking experience. The digibank model is possible because of the government investment in Aadhaars (see "India", p. 22), necessary for digital banking FinTechs to scale.

While artificial intelligence holds promise for financial services, there are legal issues to address. For example, personal data must be collected and used with consent (see "FinTech Law", p. 15).

Another concern for financial services and FinTech is how regulators will respond to the use of artificial intelligence generally, especially when there are security breaches associated with artificial intelligence systems in the financial services sector. The US government has raised concerns about the implications of artificial intelligence being deployed in the economy because it increases vulnerabilities to cyberattacks, raises difficulties in ascertaining attribution, facilitates the advances of foreign weapon and intelligence systems through technology, increases the risks of accidents and substantially increases liability for the private sector including financial institutions.<sup>81</sup> The reliance on artificial intelligence for autonomous decision-making by the public or private sector will create vulnerabilities for all sectors, including financial services, and may compromise financial infrastructure.<sup>82</sup> In a recent survey of financial services professionals, 76% believed that regulations are not up to speed on artificial intelligence and 47% believed their own organizations do not understand its risks.<sup>83</sup>

Some perceive there is a "brain drain" of Canadian artificial intelligence talent and technology. Google, for example, bought an image-recognition startup, co-founded by a Canadian university professor, while Twitter bought a Toronto-based machine-learning startup.<sup>84</sup> According to a recent study in Canada of stakeholders, startups in artificial intelligence say they are moving to the US because of a lack of government support.<sup>85</sup>

An inevitable downside of artificial intelligence is that it will decrease employment in certain traditional roles, with some predicting that artificial intelligence will cause an increase in unemployment levels.<sup>86</sup>



**Melinda Gates**   
@melindagates

 Follow

If we're going to create #AI that works for all people, we need a diverse group of people building it.



#### Artificial Intelligence Has a 'Sea of Dudes' Problem

AI software depends on data sets, and data sets have to be created by computer scientists. What happens when most of those researchers are men?

[bloomberg.com](http://bloomberg.com)

Artificial intelligence also appears to suffer from an additional challenge – the programming and therefore, the machines that will run certain functions for our society, lack diversity: its data sets are not equally created by women or with consideration of integrating diversity or inclusiveness, a problem identified by Melinda Gates.<sup>87</sup>

Another foreseeable concern is the novel legal issues that will inevitably arise with the increasing adoption of artificial intelligence.

## Internet of Everything

The potential of the Internet of Everything (IoE) is pervasive and has made its way into financial services, among many other sectors. In Canada, the financial services industry represents a relatively small percentage of the IoE market, at 27%.<sup>88</sup> However, 60% of Canadians are prepared to move their money in order to access one or more IoE capabilities,<sup>89</sup> demonstrating that there is a strong interest in IoE for FinTech in Canada. The ability of IoE technology to connect physical spaces to technology holds promise in specific sub-sectors of the financial services market. For example, Canadian insurers are paying particular attention to how the ability to collect real-time data from homes and vehicles could revolutionize insurance offerings and risk analysis.

With smart cities, there will come a time in the not too distant future where all of the connected services will, by necessary implication, require a payments component to operate, presenting significant FinTech opportunities in this area. A number of startups in China are developing FinTech for the IoE, including Silk Labs, which develops a smartphone for IoE, allowing customers to check on things such as a sleeping child, a parked car, or a pet, etc., in a way that involves deep learning and artificial intelligence.

In addition to the tech development, building FinTech for the IoE will require enhanced cybersecurity approaches, and therefore more highly specialized tech talent and computer and data scientists to mitigate against evolving threats. As smart devices get connected to the electricity grid, vehicles, municipalities, household appliances, the inter-connectivity will threaten data privacy and data integrity, with the attendant risk that the IoE can be used to locate, monitor, surveil, or target high profile people, or to obtain credentials to illegally access networks for criminal activities.<sup>90</sup> The role of regulation and the law in this area will need to evolve quickly, not only for the payment component of the IoE but also for cybersecurity issues. The role of FinTech in IoE is important since consumer-facing applications will need to have payments capabilities for the future and this is where Canada, and especially Vancouver as a future digital city, can play a key role.

## RegTech

The range of technologies that fall within the category of RegTech, as with FinTech, is fluid: RegTech solutions may include everything from gap and risk analysis tools, visualization aids and regulatory reporting systems to activity monitoring applications. Potential uses in the financial industry include client due diligence tasks through new data sources such as social media and biometrics, trade surveillance, and implementing and enforcing a wide range of protocols.

Two companies, both based in Toronto, are good examples of how FinTechs have used sophisticated technology to meet their customers' needs. DeepLearn.ng targets financial institutions wishing to augment their decision-making capabilities with systems designed to work in conjunction with their organizational structures

and Due Diligence Intelligence Quotient creates technology for third-party vendor screening and open source database compliance functions for the onboarding process. Two other good examples include Vancouver-based Trulioo, which offers a product that performs analytics and scores customers based on data from public records and social networks, and Vizor Software, which provides services to governments and regulators with real-time validation that centralizes supervisory processes, including risk analysis, early warning detection and penalty management.

The use of technology to meet regulatory requirements is not new, but the nature and scope of RegTech is changing. As businesses are collecting increasing volumes of data, RegTech tools are using increasingly sophisticated analytics and data features to create meaning from big data. The need for this overlay in highly regulated industries such as financial services, in which businesses tend to rely on monolithic legacy systems, is clear. RegTech solutions can work with financial systems, increasing the utility and usability of the underlying data.

Regulatory bodies are evaluating RegTech and the role it may play in enabling businesses to meet regulatory demands to the satisfaction of regulators. In the UK, the FCA sought input from stakeholders as to how it could support a RegTech sector. Some are looking to the online gambling sector because firms that service the legalized online gambling sector are licensed by regulatory authorities to ensure the integrity of their operations, as well as the protection of the public, and may provide a model for the oversight of FinTechs in the RegTech space to create responsible innovation. The FinTech community and regulators will no doubt be watching closely the results of the FCA, as well as other innovative approaches the FCA and others are implementing including a regulatory sandbox (see “Regulatory Sandbox”, p. 44).

## Biometrics in Financial Services

Biometrics is the computer analysis of physical characteristics of natural persons to identify them and includes fingerprints, palm prints, iris scans, voice recognition, DNA, facial recognition and veining. Biometrics is growing in financial services, especially with the development of mobile biometric contactless payments.

Biometrics is expected to contribute US\$5.5 billion in revenues for FinTechs providing services to financial institutions, and the biometrics market is expected to reach a value of US\$30 billion by 2021.<sup>91</sup> By 2020, it is expected that bank customers will use biometrics predominantly as their ID method for all sorts of channels, including ATMs and mobile apps.<sup>92</sup>

In terms of adoption, by 2020, it is expected that there will be 1.1 billion mobile biometric customers,<sup>93</sup> and by the end of this year, there will be 16 billion biometric mobile payments transactions. The use cases are continually expanding. A Costa Rica bank, Banco Nacional, is rolling out facial recognition tech to its mobile customers using tech developed by FacePhi, a Spanish tech firm.<sup>94</sup> Apple Pay and Samsung Pay (the latter’s R&D facility is in Vancouver) both use integrated fingerprint sensors to secure contactless mobile payments in physical locations, and other payments companies are similarly moving in that direction. Citigroup already uses voice recognition for its credit cards and Wells Fargo is testing iris scans with a startup.<sup>95</sup>

The biometric space is looking increasing at the security of mobile-based biometric solutions that reduce onboarding friction and ensure that financial institutions can meet onboarding requirements from an anti-money laundering, counter terrorist financing and sanctions law compliance perspective, and maintain ownership of customer identity in compliance with privacy law. The ongoing challenge is to develop tech for customer authentication and transaction verification that works across all channels and is convenient, secure and satisfies regulatory compliance.

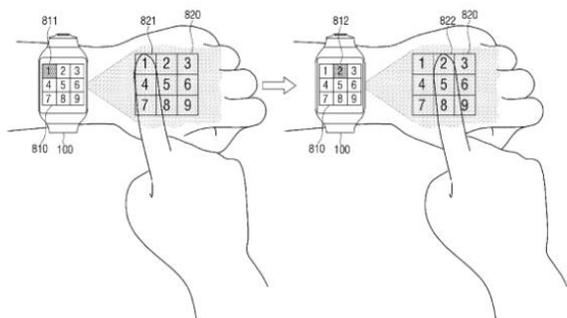
In terms of volume, India is leading the way in respect of biometrics with the introduction and implementation of the UIDAI and Aadhaar, which alone will result in the growth of the biometrics market in India to US\$2.06 billion by 2020 (see “India”, p. 22). Biometrics in FinTech, when introduced with sound systems that protect customer identity, has positive and cost-savings benefits for countries. In India, for example, iris scanning has been used to deliver pension benefits with 100% accuracy, and with a corresponding 100% reduction of fraud in provinces where many pensioners are illiterate and face language and disability barriers. In addition to mitigating fraud, countries that support innovation in FinTech with moves towards biometrics adoption, could potentially reduce taxpayer costs from

reduced instances of financial crime and at the same time, increase financial inclusion.

## Wearables

The world of financial services is changing fast. Banking customers want frictionless online services that are safe and reliable, but they also want to bank using wearable devices that are small and fashionable. Over 79% of bank executives believe their organizations have to significantly change operations over the next five years to keep pace with Millennials, including in respect of wearables. Ninety one percent of bankers expect wearable payments to be common for financial transactions in five years, but only 9% offer wearable devices as a channel and only 7% have pilots underway.<sup>96</sup> Over the next five years, wearables are expected to be completely integrated into financial services, in order to close that gap.

But providing financial services on a small wearables screen presents tech challenges, particularly considering that the onboarding process may eventually be done through wearables. To address this, many companies are working towards processes to enable multiple functions on small devices. Samsung, for example, is considering a smart watch that projects onto a customer's hand, arm or a screen.<sup>97</sup> This would provide convenience and increased visibility for customers and help the visually impaired use wearables, including the elderly, and ultimately would mean a customer could bank on their own skin.



Source: The Verge<sup>98</sup>

Not surprisingly, the fashion industry is driving changes in wearables, and MasterCard, for one, is responding with developing tech with a fashion edge that can be used in multiple devices and in ordinary things for payments, from jewellery to fobs, to high fashion.<sup>99</sup>

Wearables are taking on a different dimension towards human integration. In Sweden, for example, researchers are working on the nexus between biometrics, security and wearables for the travel industry and have tested a microchip implant with a EuroBonus identity injected in a human subject who successfully went through international security and boarded a plane with only a microchip embedded under his skin.

Implanted wearables are being researched in Japan as well. Researchers at the University of Osaka are linking wearables to the nervous system, developing a brain implant for humans from a flexible matrix of organic thin-film transistors that can be activated merely by thinking.<sup>100</sup> Existing payments from wearables include the Apple Watch, Jawbone Up4 fitness tracker and Disney's MagicBand.<sup>101</sup> This growing area of ancillary FinTech represents the future in mobile FinTech and presents enormous tech opportunities for growth for Canadian FinTech.

## FinTech Law

Technological developments usually occur faster than changes in the law. This is not to say, however, that FinTech companies or their activities are unregulated. Depending on the activities they conduct, existing regulations may apply as much to FinTech companies' operations as to their bricks-and-mortar counterparts. This section of the FinTech Report provides a brief review of some of the applicable law in the FinTech space.<sup>1</sup>



Source: 500 Startups<sup>102</sup>

### Banking Legislation

Canada's banking industry is one of the safest and most resilient in the world. Canada's regulators have worked to establish a stable banking and consumer protection environment, as well as to facilitate competitive market forces. The *Bank Act*, as well as provincial legislation applicable to provincially incorporated financial institutions, regulate prudential matters, including corporate governance, ownership and activities of financial institutions. The

<sup>1</sup> The legal review herein does not constitute legal advice. Readers are advised to obtain legal advice in respect of their operations.

Office of the Superintendent of Financial Institutions, an independent agency of the federal government, supervises and regulates federal financial institutions and issues guidelines, including Guideline B-10 on outsourcing. The *Bank Act* and OSFI guidance could apply to FinTechs or arrangements with FinTechs, depending upon the scope of activities conducted.

### Online Marketplace Lending

The impact of Canadian securities laws on online marketplace lending activities in Canada is currently somewhat uncertain, as regulatory regimes differ slightly in various provinces. In general, the term "security" is broadly defined in most Canadian jurisdictions to include an "evidence of indebtedness" and other similar concepts. As a result, the entering into of a loan agreement between an investor and a borrower company may constitute a distribution of securities and be subject to a prospectus requirement or, more typically, require reliance on a prospectus exemption, the availability of which will be dependent on the business model and the nature of the investors eligible to use the individual lending platform.

Importantly for FinTech companies operating in this sector, debt security intermediation activities that can result from operating an online marketplace lending platform may also constitute activities that fall within the business of trading securities in Canada and may therefore be subject to registration requirements. The Ontario Securities Commission issued guidance in 2015 cautioning online marketplace lenders that their activities may be subject to securities laws and recommended that online marketplace lenders consult with the Commission prior to engaging in reviewable conduct.<sup>103</sup> In addition, some provinces require lenders to register provincially if offering consumer loans.

### Payments

All Canadian provinces and territories have adopted regulations to facilitate e-commerce. These regulations protect electronic payments

by clarifying that electronic contracts or transactions are not invalid due to the use of electronic forms. Federal legislation also regulates national payment card networks and the commercial practices of card network operators under the *Payment Card Network Act*.

The Bank of Canada also has responsibility for the regulatory oversight of clearing, settling and recording of financial transactions. Two national systems are in place in Canada for the clearing and settlement of payments and are operated by Payments Canada, the Large Value Transfer System and the Automated Clearing Settlement System. Payments Canada develops rules and guidelines under the legal framework set out in the *Canadian Payment Act*, a federal statute.

Contractual obligations and guidelines have been developed by card issuers setting out rules governing the terms and use of their products and payment systems. Mandated by branded credit cards, the Payment Card Industry Data Security Standard was developed to encourage and enhance credit card security measures. The federal government also developed a *Code of Conduct for the Credit and Debit Card Industry in Canada*, which applies to card issuers and acquirers. It seeks to ensure transparency and flexibility in pricing and costs and to allow merchants to choose the payment methods they prefer. This was amended in 2015 to provide greater protection to merchants for acceptance of debit or credit cards, including mobile payments.

In 2015, the federal Department of Finance issued a consultation paper entitled *Balancing Oversight and Innovation in the Ways We Pay* as well as one entitled *Creating Opportunities in Canadian Payments*. The Bank of Canada released a paper entitled *Public Policy Objectives and the Next Generation of CPA Systems: An Analytical Framework*. These publications aim to discuss and analyze the future of payments in Canada and facilitate innovations in the payments industry and provide some insight into regulators' views on the evolution of payments. Consequently, payments regulation for new technologies could very much be on the radar for Canada's legislators.

## Other Legislation Relating to Trade and Commerce in Canada

Depending on the activities they conduct, FinTech companies may find themselves regulated by other federal, provincial or territorial regulation relating to trade and commerce in Canada generally.

### Consumer Protection

Canada has both federal and provincial legislation addressing consumers' rights and protections. Federally, legislation such as the *Competition Act* could be applicable to FinTechs. The *Competition Act*, in particular, requires, among other things, that companies refrain from deceptive marketing practices that can arise from misleading statements in advertising, prices, products and sweepstakes. Provincially, legislation such as the *Business Practices and Consumer Protection Act* (British Columbia) and the *Consumer Protection Act* (Ontario) are applicable to FinTech companies in their dealings with consumers.

The Competition Bureau recently announced a market study into technology-led innovation in Canadian financial services, looking at the competitive impact that FinTech is having on the industry and whether there is a need for regulatory reform to promote greater competition while maintaining consumer confidence in the sector.

### Privacy

Canada has adopted federal privacy legislation that applies nationwide. The *Personal Information Protection and Electronic Documents Act* (known as PIPEDA) regulates how private sector companies collect, organize and use private and personal information in the course of their commercial activities in Canada. A number of provinces in Canada have also adopted parallel privacy legislation that applies to private sector organizations doing business in those provinces.

The fundamental premise of the privacy legislation is that organizations, including FinTechs, are prohibited from collecting, using or disclosing personal information of a person without that

person's consent unless such collection, use or disclosure falls into one of the exemptions from this requirement. Depending upon the nature of the personal information, consent may be implied (e.g. reasonably implied by the circumstances) or may be required to be express (e.g. a positive act indicating consent). FinTechs that are collecting sensitive personal information, such as financial information, may be required to obtain express consent to do so; similarly, FinTechs that want to use personal information in novel ways, or disclose it to another organization for use or processing, may have to obtain express consent from the person as well. In rare cases, disclosure without consent is authorized by law to specific persons/entities such as law enforcement. It is worth noting that much of the data driving FinTechs and innovation in the FinTech space, including transaction data, sensor data, data collected from wearables, biometrics, and "big data" profiles, is considered personal information and is regulated accordingly.

### Anti-Money Laundering, Terrorist Financing and Sanctions Legislation

Regulated financial entities are subject to the federal *Proceeds of Crime (Money Laundering) and Terrorist Financing Act*. Some FinTechs are not reporting entities under the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* but where they provide foreign exchange services or money transfer services, for example, they are required to be. The lack of anti-money laundering oversight of FinTechs that conduct financial transactions in the same way as reporting entities can be problematic. FinTechs should consult with FINTRAC on whether they are obliged to be registered as reporting entities.

With respect to the other aspects of what is generally considered financial crime law in Canada, such as sanctions and terrorist financing, they are governed by the *Criminal Code* and the *Special Economic Measures Act*. Pursuant to the combined requirements of those statutes, every FinTech (in fact every person in Canada) is required to vet financial transactions to ensure no financial transaction of any person or entity who is prohibited or listed, is completed and to freeze such transaction and the attendant funds, and to report the transaction to the supervising authority under the

applicable statute. FinTechs conducting financial transactions must be cognizant of this area.

## FinTech in Other Countries

In this section of the FinTech Report, we provide an overview of 16 countries and the status of their FinTech ecosystems from the most developed to the newly emerging FinTech hubs. The purpose of summarizing other jurisdictions is to provide a backdrop against which we can compare Canada's progress and potential in FinTech going forward with a view towards evaluating areas in which our FinTech ecosystems can collaborate together.

### United Kingdom

Though the long term impact of Brexit is unknown, FinTech is still booming in the UK. Britain is the world's fifth largest economy and it attracts significant FinTech activity. In 2015, revenues in the FinTech sector reached £6.6 billion and investment in FinTech companies reached £524 million.<sup>104</sup> Total investment in Q2 2016 is down slightly overall, to £103 million, likely as a result of uncertainty regarding Brexit and other market conditions.<sup>105</sup> Tech firms in London received almost \$1.4 billion in venture capital financing in 2014, double the figure for 2013 and ten times the figure of 2010.<sup>106</sup> Over the next ten years the number of digital technology companies in London is expected to rise to 45,000 and create more than £12 billion of economic activity.<sup>107</sup>

London, as the UK's financial centre, is home to a vibrant FinTech hub, and notwithstanding the Brexit uncertainty, is still considered to be the global leader in FinTech. London has a robust pool of tech and entrepreneurial talent, combined with the world's largest financial services sector and legal expertise. London is also home to numerous FinTech accelerators and incubators, such as London FinTech Innovation Lab and Level39. In addition, London has numerous FinTech startup platforms, FinTech meetups, conferences and mentorship programs. Importantly, in 2014, Innovate Finance was established, as an independent industry organization to advance the UK as a leader in FinTech, domestically and abroad, and is sponsored by the City of London. Innovate Finance develops the UK's FinTech ecosystem, holds conferences, fosters innovation and investment and champions the UK as a FinTech leader.

Another key factor that helped establish London as the global FinTech leader was the progressive approach towards FinTech taken by the UK government. The UK led the way in adapting its regulatory system, creating tax initiatives for FinTech-dedicated investments and establishing an ecosystem supportive of FinTech.<sup>108</sup> Moreover, the UK government, early on, engaged with stakeholders in the FinTech ecosystem in an inclusive manner and in a way that supported diversity, for example, with the appointment of Eileen Burbidge, to lead its FinTech initiatives and advise the UK government on how best to support the sector.<sup>109</sup>

The FCA is the key regulator responsible for ensuring that financial services are offered in a way that protects consumers, protects the financial system and creates a competitive financial market. The FCA has been active in supporting the FinTech sector's growth, and recently launched a regulatory sandbox in which FinTechs can create and test innovative products, services and business models without being immediately regulated by financial authorities. Through the regulatory sandbox, the FCA aims to encourage companies that would otherwise not innovate because of potential regulatory barriers and the associated costs, to proceed with innovative projects with regulatory certainty<sup>110</sup> (see "Regulatory Sandbox", p. 44).

The regulatory sandbox is just one of the initiatives from the FCA's Project Innovate, a program that encourages innovation and promotes competition through disruptive innovations that challenge existing financial services models. The FCA now gives FinTechs access to regulators and timely feedback on the regulatory implications of their ideas, and provides input on structural issues that pose barriers for FinTech development.<sup>111</sup> In March 2016, the FCA entered into an agreement with the Australian Securities and Investments Commission pursuant to which both countries' regulators agreed to support innovative FinTechs and refer them to each other in order to facilitate entrance into both countries' markets.<sup>112</sup> The FCA's willingness to work with FinTech stakeholders to promote innovation in the interest of consumers is advancing the industry in the UK and driving significant investment to the UK. The UK government has a strong international brand in FinTech and

explicitly supports FinTech partnerships with banks through active policy decisions and executive leadership.<sup>113</sup>

The British Business Bank, a government-owned business development bank dedicated to supporting startups and smaller businesses is another source of support for FinTechs through its investment program. It actively helps FinTech startups access loans, equity investment and grants to acquire or replace equipment, finance expansion or gain access to working capital. UK Trade & Investment, Tech City UK and the Department for Business, Innovation & Skills are examples of a few other agencies, departments and organizations supporting FinTechs and helping them navigate government programs. This robust ecosystem of private and public support for the FinTech sector has positioned the UK as a FinTech leader. UK Trade & Investment offers support to foreign FinTechs as well, encouraging them to build alliances with the UK, and has a presence all over the world, including in Vancouver, to support that initiative and to introduce startups to the London ecosystem. Tax breaks, such as the Seed Enterprise Investment Scheme, also boost FinTech funding and have been significant in the UK.

While California and New York have considerably higher levels of investment and venture financing into their respective FinTech ecosystems, London attracts 30% compared to California's 12%, in respect of FinTech investment relative to total tech investment. This may change with the consequences of Brexit, but it is too early to tell.

Importantly, the UK introduced a novel "FinTech visa" that allows prospective entrepreneurs to enter the UK to secure funding and launch a startup before obtaining a visa, to encourage non-EU entrepreneurs, such as from Canada, to relocate to the UK.

Some of the more well-known FinTechs in the UK are Funding Circle, an online SME marketplace lender, Crowdcube, an equity crowdfunding platform, RateSetter, an online marketplace lender that allows individuals to lend their savings to borrowers, Nutmeg, a micro-wealth management firm, LendInvest, an online mortgage crowdfunding platform and Algomi, a bond investment broker service.<sup>114</sup>

## United States



Unquestionably, the US continues to lead in global innovation and startup activity and is on par with the UK in terms of FinTechs and leadership at the private sector level but it lags behind in government FinTech initiatives.

In 2015, there was US\$7.3 billion invested in the FinTech sector in the US,<sup>115</sup> and M&A activity continues to be very active. US VC investment accounted for US\$1.3 billion of the total global VC investment of US\$2.5 billion in Q2 2016.<sup>116</sup> Investment and support in the sector predominately comes from the private sector – such as venture capital, financial institutions and other companies – and not from the federal or state governments.

FinTech in the US is multi-dimensional, global and not easily defined. Its participants include firms of all sizes and stages of development, drawn from numerous fields, such as banking, credit cards, prepaid, gift and loyalty cards, payment processing, payment systems, investment management, artificial intelligence, robo-advisors, online marketplace lending, crowdfunding, distributed ledger tech, and Blockchain technology, and the myriad of companies that utilize the services and products those firms offer. New York City and Silicon Valley are globally recognized for financial services and innovative leadership, including in FinTech. Banks from all over the world go to the US for innovation, including Canadian banks.

FinTech companies face a maze of regulations from a variety of US federal and state regulators. Applicable federal laws and regulations include those focusing on banking, money transmitting, licensing, consumer protection (such as laws regarding truth in lending disclosures), privacy and data security, anti-money laundering law, securities, broker-dealers and investment advisors, and general trade practices. Further, there are the laws of each of the 50 US states, which separately license certain providers of financial services (e.g., lenders and money transmitters) and have their own consumer protection laws.

For the most part, US regulators have welcomed FinTechs within the existing legal framework—for instance, by exhibiting a restrained

approach with respect to potential enforcement actions and adopting new regulations, such as the SEC's Regulation Crowdfunding. Recently, the Office of the Comptroller of the Currency, which oversees the national bank chartering system, issued a white paper on FinTech innovation, proposing an approach to handling how banks experiment with new technologies like the Blockchain. Additionally, the US Treasury Department has issued a paper on online marketplace lending issues and issued a set of recommendations for consideration to improve disclosure for consumers and investors.

More recently, regulators are looking at what is being called "responsible innovation" in the US vis-à-vis FinTechs and whether, for example, online marketplace lenders have adequate loan servicing infrastructure, an ability to scale quickly and effectively in the event of an economic downturn, and whether privacy and consumer laws are being complied with. With respect to the Blockchain and distributed ledger technology, regulators have said that it is unlikely the federal government will pre-empt current or future state laws.<sup>117</sup>

Interestingly, investment activity in the US has shifted slightly away from well-known startup hubs to less expensive locales. The largest declines, based on deal volume, were in Silicon Valley, Austin, Seattle and New York. The top five to gain investment based on deal volume were Boston, San Diego, Dallas, Detroit and Portland.<sup>118</sup>

Some of the more prominent FinTechs in the US are Apple Pay, the mobile payments app from Apple, PayPal, a global payments company co-created by Canadian Elon Musk, Kickstarter, a non-equity crowdfunding platform,<sup>119</sup> OnDeck, an online marketplace SME lender, Kabbage, a wealth management FinTech co-founded by a woman in financial technology, Mint, a personal finance FinTech, Stripe, a merchant payments platform and Tilt, a niche payments app for groups targeted at university students.

## Singapore



Singapore is another leading and growing FinTech hub. The World Bank ranked Singapore as the easiest place in the world to do business and the tenth easiest place in the world to start a

business.<sup>120</sup> FinTech companies appear to have taken advantage of these conditions to thrive and grow.

The Government of Singapore fully supports the development of a FinTech ecosystem. It has announced plans to make Singapore a "smart nation", which involves an ambitious plan to have the private and public sectors collaborate on creating a seamlessly hyper-connected metropolis. The Monetary Authority of Singapore (MAS), Singapore's Central Bank, is also involved in supporting the FinTech sector's growth. With respect to regulation, the MAS has taken a risk-based approach to regulation in order to ensure it does not front-run innovation. For example, FinTechs providing payment services are not automatically regulated, and if they are, they will not be subject to the *Banking Act* but rather to more customized payment regulations. Many FinTech sub-sectors in Singapore are unregulated at this time, such as online marketplace lending and non-equity crowdfunding.<sup>121</sup>

In order to support FinTech, drive innovation, support diversity and ensure all stakeholders in the space are employed, the MAS recently committed \$225 million of purely public sector funds in investment to build a "Smart Financial Centre," a dedicated centre of finance to facilitate collaboration between the parties essential for FinTech innovation – FinTechs, financial institutions, think tanks, universities, legal professionals and government agencies. The MAS is also adopting a regulatory sandbox to create a protected environment for FinTechs to innovate, and is aiming to open banking platforms via application programming interfaces to enable faster innovation and integration of new IT systems within the traditional financial sector.<sup>122</sup>

The MAS is also supporting the FinTech sector in more specific ways. For example, it recently announced its intention to develop, with Singapore banks and FinTechs, an all-in-one addressing system that would allow customers to transfer money using only the recipient's mobile number or e-mail address without their banking information.<sup>123</sup> The government provides numerous grants to FinTechs to support the ecosystem, and like London, Singapore is home to numerous FinTech incubators and accelerators, such as The FinLab and FinTech venture capital firms such as Life.SREDA and Golden Gate Ventures.

While Singapore has a good tech talent pool, the city's local entrepreneurial talent pool is not as developed when compared to other leading FinTech hubs. However, Singapore has a vibrant FinTech sector and a supportive immigration regime which positions Singapore well to attract more entrepreneurs. In fact, their immigration regime is very successful; 70% of Singapore FinTech companies' founders are expatriates.<sup>124</sup>

Several global banks have set up incubators in Singapore recently and made significant investments because of the supportive government position including MasterCard, UBS, Wells Fargo, CitiBank, HSBC and JP Morgan Chase.<sup>125</sup>

Some of the well-known FinTechs in Singapore include Fastacash, a remittance startup, Dragon Wealth, an online platform for financial advisors, MatchMove Pay, a provider of credit card numbers that allows customers to make online purchases, Cashmi, an app that allows money transfers between friends on an app, and M-D-A-Q, an app which provides currency trades.

## Hong Kong



As a major banking and finance industry centre, it is not surprising that Hong Kong is another key FinTech hub. Like London and New York, Hong Kong already has many preconditions for being a FinTech centre: it has a well-educated population, abundant access to financing, and its university system has grown several-fold in the last two decades.<sup>126</sup> The combination of well-educated entrepreneurs and significant investment from both the public and private sectors creates a strong ecosystem in which FinTech companies can evolve.

FinTech investment in the Asia-Pacific region skyrocketed from about US\$880 million in 2014, to nearly US\$3.5 billion in the first nine months of 2015.<sup>127</sup> Hong Kong is also the top region in the world for FinTech adoption, with 29% of digitally active people in Hong Kong having used at least two FinTech services in the last month, compared to 17% in the US.<sup>128</sup> Hong Kong has at least 10 incubators and accelerators, including the FinTech SuperCharger<sup>129</sup> created with support from Standard Chartered, Baidu, TusPark and the Hong Kong Stock Exchange. Hong Kong also has 34 co-working spaces, some of which are free for startups to use.<sup>130</sup>

Government support for FinTech is significant in Hong Kong. In November 2015, the Hong Kong government created the new Innovation and Technology Bureau and announced a HK\$2 billion fund to boost investment in innovation and technology,<sup>131</sup> as well as a dedicated team to pay for and organize international FinTech conferences and attract international FinTech talent to Hong Kong.<sup>132</sup> In February 2016, the Hong Kong Financial Secretary announced that the Hong Kong Monetary Authority, Securities and Futures Commissioner, and Office of the Commissioner of Insurance would set up a dedicated FinTech platform to liaise with the FinTech sector and explore the application of Blockchain technology for the financial services industry.<sup>133</sup> ASTRI as well, invests in FinTech initiatives, and so do many Hong Kong universities where the tech has research capabilities. The FinTech ecosystem in Hong Kong is very supportive within the community.

Some of the more prominent FinTechs in Hong Kong include Cashyou, a P2P mobile wallet that allows customers to transfer money instantly and for free, Mobexo, a mobile payment app that allows business to create customized promotional campaigns via a merchant portal, Shopline, which allows SMEs to quickly launch their own ecommerce platforms in Asia, and Spacious, which streamlines the sale or rental of property by using data and analytics to determine whether a property is over or under valued.<sup>134</sup>

## China



China has not widely adopted the use of the word FinTech, but nonetheless, it is home to some of the world's biggest FinTech developments. In China, investment in FinTech grew from US\$600 million in 2014 to almost US\$2.7 billion in 2015.<sup>135</sup> The FinTech sector in China has a strong mobile-services orientation in payments, online marketplace lending and crowdfunding and is driven by strong collaboration between FinTechs, investments from banks and insurance companies. China is the world's second largest market for online marketplace lending and that sector has grown almost 13-fold since 2012. As of the first half of 2015, there were 2,028 online marketplace lending platforms in China.<sup>136</sup>

Over 90% of users in China access the Internet via their smartphones,<sup>137</sup> underpinning the importance of mobile platforms in

FinTech in China. All China's Internet giants offer financial services online – Alibaba with AliPay and MYbank, Baidu with Baifa, Tencent with Licitong and WeBank, and Xiaomi with its Xiaomi Finance app. China has been ahead of the FinTech game in many respects by focusing on developing mobile tech and payments.<sup>138</sup>

Tencent, best known outside China for the globally popular WeChat messaging app, launched China's first online-only bank, WeBank. In March 2015, smartphone maker Xiaomi launched an online money-market fund that lets customers earn interest on money saved in Xiaoi's wallet app. MYbank in China is a new branchless bank backed by Alibaba, launched in June 2015 with capital of more than US\$500 million.<sup>139</sup>

China CITIC Bank, a global bank based in China, recently won a "Best FinTech" award for its WeChat Pay, the first app to combine banking services, payments and social media with borderless banking and wealth management services at the customers' fingertips on WeChat.

A leader in FinTech in China is LeEco, the largest online video company in China, which manufactures "super-smartphones", TVs and even self-driving cars. They also have plans for an Uber competitor that uses fully driverless cars that are capable of being commanded by an app. LeEco has 100 million daily content viewers on mobile devices, the largest in the world, and is a leader in FinTech by connecting all of their services to mobile payments.<sup>140</sup>

China has an active and exploding high tech scene, much of which is FinTech or ancillary FinTech, but not necessarily referred to as such in China. Examples of cutting edge tech startups include Midas Touch, an augmented reality game company that lets players touch and interact with characters in virtual reality, Blue Jay Heath, a mobile platform for doctors and physiotherapists for rehabilitation of patients and sports medicine that streams customized rehab videos and dispenses prescriptions, and Silk Labs, which provides an online platform for IoE connected services with machine learning and artificial intelligence capabilities.<sup>141</sup>

The government is involved in and supports the growth of FinTech in China with initiatives that include making government services accessible on mobile phones by 2020, including, importantly, the

payments component. Municipalities are already onboard in China – 70 cities offer services through WeChat and about 86 cities offer services through AliPay.<sup>142</sup> China also has a ¥40 billion fund for its "Internet Plus" plan to integrate mobile cloud computing, big data and the IoE with manufacturing to facilitate the seamless development of e-commerce, industrial networks and mobile banking, a project which will catapult FinTech development in China.<sup>143</sup>

China's regulatory environment was accommodative in the past, however, Chinese authorities are now planning to tighten regulation over online marketplace lending after investors in Ezubao, China's largest online marketplace lender, lost US\$7.6 billion through a Ponzi scheme. Experts have generally supported the prospect of regulation in China, noting that it is likely to discourage the investment in unreliable FinTech startups and increase investor confidence.<sup>144</sup>

Besides the well-known giants, AliPay and WeBank, other well-known FinTechs in China include Zhongan, an online insurance group backed by the founder of Alibaba that mines big data for insurers, and Qufenqi, an online platform offering monthly instalment payment solutions to students in China via their smartphones.<sup>145</sup>

## India



India's FinTech sector is also booming. As one of the most populated countries in the world, but also a developing country, India has a significant non-banked population, and the Indian landscape is primed for entrepreneurs using technology to promote financial inclusion. Sixty percent of Indians are unbanked and 90% of small businesses have no links to formal financial institutions. Yet 80% own mobile phones and 32% will own a smartphone by 2017.<sup>146</sup> Between 2013 and 2014, FinTech investment in India increased 282%,<sup>147</sup> and between 2014 to 2015, grew from US\$247 million to US\$1.5 billion.<sup>148</sup> The total FinTech software and services market is currently estimated to be worth \$8 billion. By 2020, the Indian FinTech software market is expected to exceed \$2 billion.<sup>149</sup> There are over 750 FinTech companies in India, 174 of which were launched in 2015 alone.<sup>150</sup>

Banking, financial services, insurance, e-commerce and retail verticals are leading the FinTech adoption in India. With the

increasing smartphone and Internet penetration in India, there is a significant demand to provide mobility solutions to facilitate online shopping with digital wallet services to make payments. Many non-banking companies in India have created technology for credit scores based on artificial intelligence and data points, such as social media footprints, call records and purchasing history. This has allowed FinTechs in the online marketplace lending space to provide loans to consumers, giving them an edge over banks. However, the government recently announced plans to regulate online marketplace lending in India. Indian banks HDFC, ICICI and Axis have recently launched mobile phone apps to modernize and attract previously uncovered consumer bases.<sup>151</sup>

Initiatives by the Reserve Bank of India and the government have helped to create a favourable environment for FinTechs by providing steady access to funding and focused accelerator programs. The Reserve Bank of India encouraged the growth of the FinTech sector by granting licenses to 11 entities to easily set up payment banks to provide savings, deposit and remittance services.<sup>152</sup> The government also released a discussion paper proposing the removal of surcharges on digital transactions and tax benefits for consumers and businesses using online payments.<sup>153</sup> Moreover, the Reserve Bank of India is creating a federal working group of regulators, lawyers, FinTechs and other stakeholders to create a FinTech ecosystem.<sup>154</sup>

The government finances FinTech through its program called “10,000 startups” which will fund and support 10,000 tech startups in India by 2023,<sup>155</sup> and funds an annual FinTech conference to support the growth of FinTech. The government is also prioritizing financial inclusion with the introduction of such programs as the *Pradhan Mantri Jan Dhan Yojana* and Digital India. In 2008, the government established the Unique Identification Authority of India (UIDAI) to provide citizens and residents with an official identity number (the Aadhaar), to enable the government to improve the delivery of services, reduce fraud and corruption, facilitate voting processes and improve security. The UIDAI was tasked with developing the necessary institutional, technical, and legal infrastructure for issuing Aadhaar numbers that could be verified and authenticated in an online, cost-effective manner, as well as robust enough to eliminate duplicate and fake identities.<sup>156</sup> As of 2016, the UIDAI has biometrically enrolled over 1 billion people in India. The

authentication market of the Aadhaar number can be used in various services and applications ranging from border control, banking and healthcare. By virtue of the Aadhaar project alone, India’s biometric market is predicted to grow to \$2.06 billion in 2020.<sup>157</sup>

In September 2014, the Indian government also launched a Biometric Attendance System (BAS) using the identification number provided through UIDAI for employment purposes. In March 2015, several states launched iris-based biometric identity solutions for pension distribution to address literacy and language barriers faced by 50% of the pensioners. Such solutions reduce fraud financial crimes associated with pension benefits.

Finally, the Unified Payment Interface (UPI) was launched in India in April 2016, in an effort to bring India’s unbanked and underbanked citizens into the formal financial system through a digital payments structure. The Interface, created by retail banks and backed by the Central Bank of India, is an app that allows customers to access accounts and exchange money without having to provide bank details or other identification to another party. However, the proposal is not as easy as it may seem. Online banking in India is plagued by security and financial crime concerns. For example, online banking and plastic card fraud increased 35% from 2012 to 2015 in India.<sup>158</sup> This is an example of how FinTech can enable speed and convenience in financial services, but requires responsible innovation that provides safeguards to prevent theft, misuse and unauthorized sale of personal information.

India has many FinTech startups, including MyDala, a marketing platform that connects merchants and consumers through channels online and mobile applications. MyDala has a presence in over 200 cities and has 200 million registered users, with the potential to reach more than 100 million users through the Internet, mobile devices and TV platforms. Other prominent Indian FinTechs include CashKaro, a cashback service partnering with over 1,000 retailers, and Fulfil.IO, which helps small businesses migrate to the cloud and mobile technology for inventory management.<sup>159</sup> All three are founded by women in financial technology.

## Iran



Iran has a young and well-educated population of 75 million people who live in an increasingly connected world where online commerce and FinTech will play a vital role in the growth of the economy. Iran also has the highest share of 15 to 29 year-olds in the world, relative to its overall population.<sup>160</sup> Despite economic sanctions, which eliminated foreign investment in Iran, its startup ecosystem nonetheless was booming pre-implementation of the Joint Comprehensive Plan of Action. In 2015, it had a 150% growth in the number of startups compared to 2014. At the end of 2014, there were 150 startups in Iran; there are now 400 startups in Tehran alone. Iranians are also heavy users of tech and are the most advanced audience in the region.<sup>161</sup>

While Iran has FinTech, it has tended to consider it a component of e-commerce, as does China. Iran has a strong banking infrastructure which developed because of the sanctions and isolation of Iran's banking system. Iran also has the highest number of debit card penetration compared to similar markets in the Middle East and the culture of online banking is widespread in Iran. When Iran's banking system is connected to the international market and regulations ease, we will see rapid development of FinTechs in payments, insurance and other financial services.<sup>162</sup>

The startup culture in Iran got a boost with the launch of اوا تک (Avatech)<sup>163</sup> in 2014, located at the University of Tehran, one of the first accelerators in Tehran. Avatech provides entrepreneurs with mentorship, seed funding and a co-working space and helps them pitch to investors for funding.

Iranian startups are mostly funded by local VCs, such as سراوا (Sarava) Ventures,<sup>164</sup> which funded دیجی کالا (DigiKala), Iran's largest e-commerce website,<sup>165</sup> and کافه بازار (Cafebazaar), the largest online Persian android marketplace. شناسا (Shenasa), another local VC, is the venture capital and private equity arm of Pasargad Bank,<sup>166</sup> Iran's fifth largest private bank.

The lifting of economic sanctions in Iran is attracting international VCs interested in investing in Iranian FinTech, including Griffon Capital, Iran's first private equity firm which invests in early stage startups, and Partsazan Investment Group's VC arm, which invested in Buyex Investments, Iran's leading fashion e-commerce website. In 2016, there was over US\$20 million in investment in FinTech, and experts expect this number to grow significantly in the coming years.

Although FinTech is a new phenomenon in Iran, it is evolving quickly and attracting an increasing number of players. Iran's "Startup weekend"<sup>167</sup> and other educational entrepreneurship events even engage high school and elementary school students in Iran. There are, for example, numerous educational startup websites, such as the کاریا (Karya) Startup school,<sup>168</sup> which educates startups with the newest methods of setting up a successful startup and offers them free advice and access to incubators, and خوشفکری (Khoshfekri),<sup>169</sup> a similar online forum which caters to entrepreneurs in Iran, Kurdistan and Afghanistan.

There are many prominent women in the startup tech community in Iran. For example, Reyaneh and Bahareh Vahidian launched the first startup weekend for women in Tehran, bringing together women entrepreneurs to support development of the ecosystem and provide networking opportunities.<sup>170</sup> Fifteen years ago, before anyone in Iran knew what a startup was, a leading woman in tech, Behnaz Aria, co-founded موسسه کهکشان نور (the Kahkeshan Institute of Technology),<sup>171</sup> the country's first IT centre for education and training. Journalist Shahram Sharif founded ITiran.com,<sup>172</sup> the first independent tech portal in Farsi, that publishes and analyses new technological developments in the world for Iran's gaming tech community. Women entrepreneurs in Iran are supported and, in fact, women comprise most of the students enrolled in STEM in Iran, the backbone of FinTech.

The government of Iran has played a key role in fostering a culture of entrepreneurship and innovation in Iran. The Vice-Presidency for Science and Technology, Dr. Sorena Sattari, started an initiative project called "100×100" which funds 100 startup tech events across Iran for 100 attendees, in order to train and inspire entrepreneurs and empower Iranian startups. The goal is to have 10,000

entrepreneurs connected through 100x100 in two years to share knowledge, provide support and mentoring opportunities across Iran.

The government supports accelerators and startups by easing regulations and tax laws for early-stage startups. While not technically called a regulatory sandbox, Iran has effectively implemented a regulatory sandbox for startups with relaxed laws for tech innovation. In 2015, Iran's Chamber of Commerce and the Department of Science and Technology established a joint committee to support knowledge-based companies with relaxed laws. Various exemptions and reliefs including tax, customs and importantly for young adults, military service exceptions, are available for knowledge-based tech and FinTech startup entrepreneurs.<sup>173</sup>

Iran also provides state-funded incubators at numerous university campuses and at public spaces. One such public venue funded by the government to help the tech sector is پارک فناوری پردیس (Pardis Technology Park),<sup>174</sup> which is so successful it is dubbed the "Silicon Valley of Iran", supporting many incubators and FinTechs to develop, commercialize and scale. President Rouhani has also launched a program of low interest loans for 1,650 startups a year in Iran in an effort to jumpstart entrepreneurship.<sup>175</sup>

For many years, Iran has invested in industries that rely on intensive R&D, a policy that is unanimously supported in Iran. Iran also supports the development of a knowledge-based economy and supports high-tech firms in this area.<sup>176</sup>

The government helps in other ways to promote Iranian talent. In 2015, the Iranian government funded a startup conference, "Iran Web & Mobile Festival"<sup>177</sup> with 800 attendees from all around the world, which played a key role in promoting Iranian startups. Another event with similar function is تداکس کیش (TEDxKish),<sup>178</sup> an independent event to catalyze innovation into action and promote Kish Island as a hub for innovation.

A key ingredient for FinTech success in Iran is its integrated financial system شتاب (Shetab), a unified, electronic clearance system for the entire Iranian banking system that manages transactions from credit cards, ATMs and point-of-sale terminals. Shetab paves the way for

businesses to process transactions in Iran, however, it is still not connected to foreign banks.

For ancillary FinTech, Iran is incredibly active and advanced in artificial intelligence. Artificial intelligence is crucial to the development of FinTech and banking technology and such development, to be sustained, requires R&D funding and university science programs, both of which Iran has. Iran was one of many countries that participated in the RoboCup World Championship in 2016, an international competition that tests participant countries' artificial intelligence capabilities. Iran won 13 prizes at the 2016 RoboCup competition, winning the overall competition, and winning first place for artificial intelligence in infrastructure and virtual robotics. Iranian high schools won first place, beating out universities in 45 other countries in artificial intelligence.<sup>179</sup>

In May 2016, Iran launched a portal of smart government services, one of the most significant initiatives to implement e-government services in Iran. The system will offer a single secure portal for e-government services on mobile devices and online<sup>180</sup> and help build Iran's FinTech ecosystem further as government payment systems are deployed.

Iran has a national strategy to be the leader in science and technology<sup>181</sup> in two years and in that vein, it is well-positioned with 36 science and technology parks hosting more than 3,650 science and tech companies<sup>182</sup> to be a FinTech leader.

The FinTech ecosystem in Iran also benefits from an abundance of well-educated scientists. There are world class technology universities in Iran, and more students, including more women per capita, studying STEM, than anywhere else in the world. There are approximately 40 students in tech in Iran per 1,000 students and close to 5 million students enrolled in STEM annually in Iran.<sup>183</sup> Iran also has significantly higher productivity compared to several other countries, and lower labour costs compared to Western countries. Another important benefit of FinTech in Iran is that it is the largest centre of Islamic finance in the world, accounting for more than 40% of the world's total Islamic banking assets, and is the only Muslim country, besides Sudan, where the entire financial industry is obliged to be consistent with the principles of Sharia law.<sup>184</sup>

Iran's ecosystem is very strong but it needs FinTech role models and international exits. More accommodating regulations and complete lifting of international sanctions will also open up opportunities for international mergers and acquisitions in Iran.<sup>185</sup> Numerous companies in the West are desirous to do business in Iran but they lack knowledge of Iran's FinTech space, and connections to business people they trust who can navigate the cultural, legal and business environment in Iran.

## Australia



Australia is emerging as a significant FinTech jurisdiction. It is an important financial services market in Asia, with four of the 25 most profitable banks in the world, and the fourth largest pool of investable funds in the world. Over 450,000 Australians are employed in the financial services market,<sup>186</sup> and an estimated 10,000 work for FinTech companies.<sup>187</sup> In 2008, AU\$ 139 million was invested in the FinTech sector, expected to increase to AU\$ 42 billion in next year.<sup>188</sup>

While Australia had a somewhat slower start in FinTech compared to the UK, it is now accelerating rapidly in the space. In March 2016, the Australian government launched a national plan to develop the Australian FinTech market which includes a regulatory sandbox for FinTech startups which would grant waivers from certain regulatory requirements to support the growth of innovation in financial services.<sup>189</sup>

Moreover, Australian regulators are increasingly progressive in their approach to the FinTech sector. The government acknowledges that stimulating FinTech innovation is important in order to make the country's financial services market more efficient, customer oriented and internationally competitive. The recently released National Innovation and Science Agenda encourages early-stage investment in FinTechs to facilitate access to capital and support growth.<sup>190</sup> The government also introduced measures to incentivize investment in small FinTechs with high growth potential including incentives granting investors a 20% non-refundable tax offset on investments capped at AUS\$200,000 per investor per year and a 10-year capital gains tax exemption for investments held for 12 months, and additional tax incentives for early stage venture capital limited

partnerships, coupled with increased limits on maximum fund size. The government also launched an AUS\$8 million incubator program of purely public sector funds to support FinTech startups and introduced a new foreign entrepreneur visa to encourage entrepreneurs to relocate to Australia to develop the FinTech sector.

Both federal and state governments are funding FinTech hubs in Sydney and Melbourne. The Commonwealth Government is investing AUS\$36 million for international FinTech collaborations and to fund FinTech startups to participate in offshore hubs in San Francisco, Shanghai, Tel Aviv and elsewhere to gain the mentorship, expertise and connections they need to succeed and scale globally from Australia. The Australian Securities and Investments Commission and the FCA signed an agreement to provide assistance to FinTechs from each country seeking to enter the other's market.

Changes in securities legislation have also been introduced in Australia to allow more companies to crowdsource equity funds through a new category of licensed intermediaries. The Australian Securities and Investments Commission recently released a draft consultation paper clarifying the existing regulations regarding the provision of digital advice, and with the collaboration of the Reserve Bank of Australia and the Australian Prudential Regulation Authority, is working on a scalable regulatory regime that will impose high regulatory standards on payment service providers that provide access to large widely used payment systems.

The Commonwealth Government has been proactive in encouraging the growth of the FinTech sector in Australia. This support, combined with a strong financial services industry, is key to Australia's FinTech sector growth. However, with a low share of entrepreneurial and science and technology graduates, talent and resources will likely pose upcoming challenges for Australia.<sup>191</sup>

Some of Australia's better known FinTechs include FirstStep, an app for users to invest their loose change, Invoice2go, a paperless invoicing app, VentureCrowd, an equity crowdfunding platform specializing in startups, property and credit investments,<sup>192</sup> and SocietyOne, an online marketplace lender connecting investors with borrowers anonymously.

## Germany



The FinTech ecosystem in Germany is swiftly expanding. In 2014, \$82 million was invested in FinTech companies.<sup>193</sup> So far in 2016, US\$423 million has been invested in FinTech companies.<sup>194</sup> The German FinTech market has grown to over 400 startups at the beginning of the year, increasing by 24% since 2015.<sup>195</sup>

Germany has FinTech hubs in Frankfurt, Berlin, Munich and Hamburg, and currently ranks second in Europe for FinTech behind the UK.<sup>196</sup> Germany has a growing vibrant FinTech ecosystem, which attracts funding from major financial institutions. One of the largest banks in Germany, Commerzbank, actively invests in FinTech startups through its programs at Main Incubator and CommerzVentures.<sup>197</sup> The increased participation of major banks in Germany is expected to shift the balance of innovation, which has to date focused on the consumer-facing part of finance, to the investor-facing part of finance,<sup>198</sup> such as B2B lending, smart portfolios and equity crowdfunding.

FinTechs face some regulatory obstacles in Germany. Copyright and data protection laws are quite strong and more than 50% of startups report regulation as having a negative impact on their growth. Another hurdle for FinTechs, especially those in online and mobile banking, is anti-money laundering laws that mandate in-person onboarding. The head of group development strategy at Commerzbank has also noted that consumer protection laws are stronger in Germany than elsewhere, so Germany is not the first place innovators typically try out new products.<sup>199</sup>

However, the Germany Federal Financial Supervisory Authority has recently launched an internal project and its first conference focusing on FinTech, suggesting that Germany is moving toward a more supportive approach to FinTech regulation to support expansion of a FinTech ecosystem.<sup>200</sup> Many FinTechs in Germany are seeking banking partnerships to avoid the costly regulatory requirements of operating in the financial services sector.<sup>201</sup>

Some of Germany's well-known FinTechs include Moneymeets, a FinTech supermarket, Number 26, a mobile bank account app,

Auxmoney, a P2P lender, Kapilendo, a crowdfunding lending platform and Kreditech, an online marketplace lender.<sup>202</sup>

## Israel



Israel has a well-established startup ecosystem with an increasing focus on FinTech. In terms of investment, in 2009, \$13 million was invested in FinTechs, in contrast to \$369 million in 2014. In 2002, Israel had 90 companies involved in FinTech; now it has 430.<sup>203</sup> In the first three quarters of 2015, 506 Israeli startups collectively raised \$3.2 billion.<sup>204</sup>

The key areas of FinTech development in Israel include cybersecurity, information security, finance, mobile innovation, data, trading and IT services.<sup>205</sup> Israel's first FinTech hub, The Floor, was launched in 2015.<sup>206</sup> The government of Israel supports the FinTech sector financially in numerous ways; for example with R&D grants that range from 20% to over 50% of the total approved expenditures for projects conducted in certain development areas,<sup>207</sup> and with reduced investment and startup costs.<sup>208</sup> As a result of a favourable government environment, many global banks and tech firms have created FinTech R&D tech centers and accelerators in Israel such as Barclays, Citi, SunGard, PayPal, Intuit, RSA and IBM.<sup>209</sup>

In order to boost the startup culture in Israel, Tel Aviv commenced a program with Millennials in which they organized regular meetups at places Millennials go – bars – in order to engage them in municipal affairs and support their desire for entrepreneurial growth.<sup>210</sup> Tel Aviv entirely funds free co-working spaces for entrepreneurs. Like Vancouver, Millennials in Tel Aviv are in small apartments and need space to innovate; to accommodate this, Tel Aviv opened a network of startup co-working centres to support the startup ecosystem. The result of government support for innovation in Israel is that Tel Aviv now has the highest number of startups in the world.

Some of the more well-known FinTechs in Israel are Fundbox, a company that loans businesses money for outstanding invoice payments, Payoneer, a financial services business that provides online money transfers and e-commerce payment services, eToro, a social trading and multi asset brokerage company, and Zooz, a

technology company which provides a payments platform designed to help merchants maximize their payments performance.<sup>211</sup>

## France



Although there are over 100 FinTechs in France,<sup>212</sup> the FinTech sector has been relatively slow to develop compared to the UK. An estimated US\$71 million was invested in FinTech in France in 2015, an amount which pales in comparison to the UK or Germany. The French FinTech scene includes online marketplace lending, crowdfunding and payments.<sup>213</sup>

France is working hard to create a FinTech ecosystem. In 2015, 36 companies joined forces to create the France FinTech Association.<sup>214</sup> Recently, the Banque de France, Autorité de contrôle prudentiel et de résolution, and the Autorité des marchés financiers announced dedicated FinTech teams to work with FinTech startups to provide a common structure for dialogue to reduce regulatory barriers in FinTech and support a new national FinTech strategy.<sup>215</sup>

The government has also launched several initiatives to support entrepreneurship, providing startups with funding for tech R&D, enhanced equity and debt financing from France's public investment bank, favourable taxes on capital gains for investors, a 50% discount on investment in SMEs for high net-worth individuals, and five years' amortization of corporate venture investments in SMEs.<sup>216</sup>

In addition to its regulatory restructuring, the French government created a generous startup immigration program to attract foreign entrepreneurs and support them in setting up companies in Paris. The program includes the use of a free co-working startup services to launch in France, contracts for services to ensure the startup has revenues to succeed, unconditional government grants, and free office space in Paris. The French government has also launched startup incubators in other countries around the world as part of its "La French Tech" initiative, such as the French TechHub in Seoul which incubates SMEs in high-tech industries.<sup>217</sup>

Well-known FinTechs in France include Leetchi, which allows customers to collect and manage money as a group,<sup>218</sup> Finexkap, an online marketplace lender that brings together SMEs and qualified

investors, Compte-Nickel, an alternative service bank account that allows customers to make electronic payments, and PayByPhone, a platform that supports payments via touch phone.<sup>219</sup>

## Kingdom of Bahrain



FinTech is at a very nascent stage in the Kingdom of Bahrain but it is evolving. The Kingdom of Bahrain is seeing increased innovation from local FinTech companies that are providing solutions to both the local and regional markets. To support this, the Central Bank of Bahrain has developed comprehensive rules for the payments space in order to support FinTech.

There is significant growth potential for FinTech in Bahrain, and the Middle East generally. The population of the Kingdom of Bahrain is tech savvy and the mobile penetration rate is one of the highest globally, at over 180%.<sup>220</sup> Firms, especially those in the financial services sector, are realizing the importance of embracing FinTech and investing in it, or risk seeing their business models being disrupted. An advantage of Bahrain is that it is a microcosm, where FinTechs can test new technologies and subsequently, roll them out to the rest of the region as they scale to market.<sup>221</sup>

In respect of Islamic finance, there is an opportunity for FinTech in Bahrain to help Islamic finance grow in terms of technology and legal knowledge, and expand its reach through the adoption of new and innovative technologies. Additionally, FinTech can help address the intricacies of Islamic finance and help drive lower fees for financial services. This is an area which Bahrain is developing, given its status as an Islamic finance nation and home to the Accounting and Auditing Organization for Islamic Financial Institutions and the International Islamic Financial Market. The presence of these two institutions is expected to help the sector standardize solutions, accelerate approvals and allow for scale across multiple jurisdictions.<sup>222</sup>

The Bahrain Economic Development Board and the Central Bank of Bahrain are working together to develop a FinTech ecosystem in Bahrain. Such development is focused on ensuring that the

regulations are conducive to both regulate and accommodate the growth of FinTech. Additionally, the Kingdom is forming a government-funded incubation and acceleration program with mentoring networks and funding mechanisms to support the growth of FinTech in the Kingdom of Bahrain. Firms that are based in Bahrain can utilize an array of support packages that are provided by Tamkeen, the government agency that supports Bahrain's private sector for economic development.<sup>223</sup>

Bahrain's Economic Development Board facilitates investment in Bahrain by assisting companies in setting up and obtaining the necessary regulatory approvals and registrations at no cost. Additionally, support in terms of building a network of contacts is provided to startups, as well as grants to support FinTech sector development, from Tamkeen.

Bahrain has reached out to leading tech nations, such as India, and offered expansion opportunities in Bahrain to help it build innovation leadership and startup expertise, as well as tech expertise for its FinTech ecosystem.

A new promising FinTechs in Bahrain is Valopay, an online platform that simplifies communication and facilitates payments between sellers and buyers on Instagram.<sup>224</sup>

## Switzerland



Although Switzerland is a key financial centre, its FinTech ecosystem is underdeveloped compared to that of other countries. Despite its skilled labour market, competitive tax rates, and economic stability, Switzerland's venture capital and incubator landscape is at an early stage of development. The Swiss government and Swiss based financial institutions have not yet provided significant financial or regulatory support to the growing FinTech sector, compared to other countries.<sup>225</sup>

In 2014, CHF\$470 million venture capital was invested in Swiss startups, a 10% increase compared to the previous year. However, the number of financing rounds remained almost at the same level.<sup>226</sup> There are over 100 Fintech startups in Switzerland

concentrated in investment and asset management, financial portals, payments, crowdfunding and data management.<sup>227</sup>

FinTechs in Switzerland face both advantages and disadvantages. The Swiss economy is one of the most competitive in the world, and the high cost of living makes it expensive to start and run a business.<sup>228</sup> However, there is startup support, including government financial support, provided through accelerators and incubators.<sup>229</sup>

While the regulatory landscape in Switzerland has not generally been supportive to the growth of FinTech, the Swiss Financial Market Supervisory Authority, responsible for financial regulation, recently introduced new initiatives aimed at stimulating growth and innovation in the Swiss FinTech sector. Among the changes include new rules on client onboarding to allow online customer identification and the introduction of a less onerous licensing category for financial innovators, alongside a license-exempt regime for startups.<sup>230</sup>

FinTechs in Switzerland include DealMarket, a private equity marketplace, eWise, an international provider of personal data management solutions, Knip, a digital insurance broker mobile app, and NetGuardians, a provider of anti-fraud solutions.<sup>231</sup>

## Ireland



FinTech is expanding in Ireland. In 2015, €522 million was invested in Irish FinTech, a 30% increase from 2014 and 90% increase from 2010. International investors invested 46% of total funds raised, with private investors providing most of the seed funding.<sup>232</sup>

83% of banks in Ireland reported that they are fearful of FinTechs outpacing them; while 27% said they have no deals lined up with FinTech companies; and 69% are putting FinTech at the heart of their strategy due to the advantages of cost reduction and greater client retention.<sup>233</sup>

FinTech is a priority for the Irish government. Enterprise Ireland, the government agency in Ireland responsible for supporting Irish export business, has a dedicated FinTech team in Dublin and manages more than 220 clients with internationally focused business strategies related to FinTech. The 220 clients in the FinTech portfolio

offer a wide variety of services, including payments, financial software, insurance, business process outsourcing, online marketplace lending, and supply chain finance.<sup>234</sup> Other key areas in Irish FinTech include fraud detection, biometrics, security, and personal finance.<sup>235</sup> Due to the Irish government's support of FinTech, Ireland could add 5,000 new jobs in FinTech by 2020.<sup>236</sup>

The Irish Government has also developed IFS2020, a strategy for Ireland's international financial services sector which includes promoting Irish FinTech internationally and engaging in strategic trade missions, as well as developing a robust FinTech infrastructure and regulatory environment.<sup>237</sup> Ireland recently launched a €500,000 grant fund for FinTech startups in Ireland and funded co-working spaces for FinTech to support startups and allow them to engage with key members of the FinTech space.<sup>238</sup> Ireland is home to a number of dedicated accelerators and innovation spaces that support FinTech development.<sup>239</sup>

The regulatory regime in Ireland is receptive to FinTech.<sup>240</sup> The Irish government has cited the British government's regime as a model for its own regulatory policies and is contemplating a regulatory sandbox similar to that in the UK (see "Regulatory Sandbox", p. 44). The Government has also recommended the appointment of a FinTech ambassador for Ireland to liaise with industry and develop effective regulatory policy, similar to the role Eileen Burbridge holds in the UK.

FinTechs in Ireland include Juggle, a consumer platform that provides a financial well-being program, and Touchtech Payments, an online payments app.<sup>241</sup>

## United Arab Emirates



FinTech in the United Arab Emirates is practically non-existent at the present time.<sup>242</sup> There are only a handful of FinTech companies known to be operational and they are in online marketplace lending and e-commerce space. Although the United Arab Emirates economy has traditionally relied on oil, the declining crude oil industry has meant that the government is looking at FinTech for economic diversity and sustainability. Abu Dhabi recently announced

that it has adopted a plan to be a FinTech hub for certain other countries in the Middle East. However, several of those countries have not endorsed the proposal that Abu Dhabi act as their FinTech hub and are pursuing FinTech plans of their own to attract investors and innovators in financial services (see "Kingdom of Bahrain", p. 28).

The UAE has a mobile penetration rate of 78%,<sup>243</sup> which trails behind the Kingdom of Bahrain at 180%, but nonetheless is strong for financial services delivery in the mobile environment. The financial regulator of Abu Dhabi is considering drafting a legislative framework in support of the establishment of the proposed FinTech hub for the Gulf region.<sup>244</sup> National bank, Emirates NBD, recently announced an investment of DH500 million over the next three years for FinTech and hopes to launch the first digital bank in the UAE.<sup>245</sup> The area lacks a tech base and tech talent to launch FinTech but there are discussions taking place on how best to acquire the talent in developing a FinTech ecosystem.<sup>246</sup>

Dubai is beginning to develop a FinTech hub. In January 2016, Dubai rolled out a phone number based payments system, allowing bank customers to replace credit and debit cards altogether and just use their phone numbers for payments. The move is designed to integrate payments into Dubai's smart digital city initiative.<sup>247</sup> In February 2016, the Government of Dubai announced a program related to Blockchain technology that involves infrastructure for financial transactions on the Blockchain with approval of certain "members" to "limit money laundering and facilitate shopping on social media".<sup>248</sup> Details on the use of Blockchain tech is related to, or can be used for, social media shopping, have not yet been disclosed. A potential game changer in FinTech for the UAE is the deal forged between several Iranian banks and Dubai-based Network International to process payments in and out of Iran, a deal that will help grow FinTech in the UAE when Iran connects to the West financially.

For FinTech startups to succeed in the UAE, they must have Islamic finance expertise and offer solutions that comply with Sharia law, which requires legal and structural adaptation for foreign entrepreneurs and international collaboration. With respect to lending, for example, two key factors are Sharia's musharakah principle, pursuant to which a lender must share both profits and

losses from a loan with a borrower, and murabaha, pursuant to which a lender cannot charge interest. In practice, however, in Islamic finance, financial institutions and lenders have developed work-arounds by adding certain customary permitted transactions to offset the requirements of Sharia law. Global FinTechs that are knowledgeable about Islamic finance stand poised to benefit when Abu Dhabi launches its FinTech strategy.

A promising FinTech that exists in the UAE is Cashnomix, a cloud-based platform for invoice collections.

## Stakeholder Views

To inform this FinTech Report, the authors sought the views of a wide variety of stakeholders, including FinTech startups, governments, NGOs, entrepreneurs, financial institutions, tech firms, accelerators, associations and universities, on a variety of topics relevant to the development of FinTech. Many of the stakeholders who agreed to have comments attributed to them are identified in this section of the FinTech Report. Others agreed to provide insight without attribution. This section of the FinTech Report summarizes the views of participating stakeholders and does not represent the views of its authors.

### Startup Success

For a baseline assessment, we asked stakeholders for their views on what is needed for startups to succeed in Vancouver and Canada, and the biggest challenges faced by startups. Stakeholders consistently identified three crucial factors that are necessary for any startup, including a FinTech, to succeed in Canada:

- Access to funding.
- Attracting and retaining talent.
- Government support, both in terms of funding, programs and regulatory engagement.

Interestingly, stakeholders from other countries that have a more mature FinTech ecosystem, also identified access to talent, access to funding and government support as crucial ingredients for success.

We asked stakeholders to describe how each of Canada, British Columbia and Vancouver ranked, in their view, in terms of providing the elements necessary for FinTech startup success and the responses were varied:

- A national bank respondent was of the view that Canada ranked only moderately adequate.
- FrontFundr, an online equity crowdfunding platform based in Vancouver, said Canada ranks highly but there is room for improvement.
- Wildeboer Dellelce LLP, an Ontario-based law firm, noted, that there are constrained exit opportunities for startups in Canada and “made in Canada” risk aversion resulting in capital that chases the same handful of companies.

The overall sentiment from most stakeholders was that Canada ranked between moderate to high in terms of generally supporting startup success. Stakeholders noted a number of areas that Canada could improve upon to support startups, including more active support in the following areas:

- Government funding in the way of grants.
- Government engagement in supporting startups.
- Solutions to address gaps in tech talent.

A national bank was positive about British Columbia and Vancouver’s support for startups, citing several differentiating factors:

- An entrepreneurial and innovation mindset that is more prevalent in Vancouver than elsewhere in Canada.
- Tech capabilities and expert talent in Vancouver.
- A bold approach to risk-taking and willingness to adopt technology faster in Vancouver.
- Access to, and influence from, Asia for high tech development in Vancouver.

- The presence in Vancouver of leading tech firms, such as Samsung Pay, Facebook, Microsoft, Electronic Arts, SAP, D-Wave and Amazon.

Frontfundr noted that the Vancouver FinTech ecosystem was different from other countries because it was highly collaborative and supportive. Payfirma, a Vancouver-based FinTech in payments offered similar thoughts:

*“... in Vancouver, successful entrepreneurs and angel investors typically give back to the community and support startup growth by providing access to funding and mentorship.”*

Payfirma

Stakeholders also saw room for improvement for British Columbia and Vancouver, noting the need for:

- Better access to uncomplicated funding in the way of grants.
- More access to foreign markets to scale, especially in Asia.

Silicon Valley-based 500 Startups, which has a portfolio of over 1,500 early stage investments, is a world leader in accelerating successful startups and is the world’s most active early stage investor, honed in on the necessity for Vancouver to have not only tech talent, but access to advisors who have started, scaled and exited startups. Many stakeholders noted the difficulty in scaling and exiting in Canada.



Source: Twitter

The prohibitively high cost of housing in Vancouver was raised by some tech companies as an impediment to attracting and retaining top-notch talent to Vancouver. Some stakeholders felt that government leadership was needed to address this issue to help retain talent if Canada and Vancouver aspired to lead in FinTech. RentMoola, a Vancouver-based FinTech that creates a payment method for housing rentals, noted that the high cost of housing is becoming a serious concern.

## Innovation in Canada

A critical ingredient for FinTech excellence is a culture of innovation. Stakeholders generally agreed that although Canada fosters innovation, more could be done. Women In Payments, a prominent international payments association, remarked that:

*“... Canada is lagging behind in innovation... Australia is changing its economy from one that is dependent upon natural resources, to one based on innovation and tech, with a very engaged government, financial services sector, universities and FinTechs.”*

Women in Payments

Vancouver-based Witkit, a tech encryption company, commented that Vancouver has enough innovators but not enough support for innovation, so innovators leave Canada.

*“It’s remarkable how many startups leave Vancouver for places where there is support, such as Silicon Valley or the UK and make a smashing hit.”*

WitKit

## Canadian FinTech

Following a baseline assessment of support for startups generally and Canada’s innovation culture, stakeholders were asked to comment specifically on support for FinTech innovation. A number of specific themes emerged in comments on what more can be done to bolster the Canadian FinTech ecosystem, which are summarized below:

- A Toronto-based financial stakeholder noted that although Canada ranks high and there is sufficient capital available, the Canadian ecosystem falls behind in facilitating access to potential customers and partners for FinTech growth.

## Government Engagement & Support

A significant number of stakeholders surveyed thought that governments in Canada had a significant opportunity to do more to advance the success of Canadian FinTech, both at home and abroad.

- nTrust, a Vancouver-based payments and remittance FinTech commented on the role of government, saying:

*“... policymakers in Canada need to set the stage for FinTech and drive the innovation agenda forward.”*

nTrust

National stakeholders noted that in the international FinTech landscape, Canada does not have a high profile, which impacts the ability of Canadian FinTechs’ to access international markets. Innovate Finance, the UK-based FinTech trade association supported by the government, noted that early engagement with financial institutions, startups and tech providers is critical to support responsible innovation.

A number of stakeholders applauded the proactive approach of the UK in terms of regulation and engagement as a model for Canada. OnDeck, which operates in the US, Canada and Australia, echoed comments from other stakeholders that governments in Canada should become more engaged in FinTech and follow in the footsteps of policymakers in the UK and Australia.

APrivacy, a Waterloo-based tech company that provides privacy systems, said that, despite the global importance of FinTech, Canada does not rank in the top 20 around the world for FinTech. An influential stakeholder in Canada went so far as to say that the government is “not at all aware of the FinTech revolution” or what is at stake with the disruption of financial services.

On the other hand, a number of stakeholders noted that interest for FinTech is gaining traction among some government agencies in Canada. RentMoola reported that the federal government is “now beginning to appreciate that FinTech is real.” Koho, a Vancouver-based FinTech that provides a mobile alternative to a traditional bank account, also noted recent conversations with the federal government in a similar vein. StrategyCorp, a Toronto-based public affairs, communications and management consulting firm, noted that governments are just learning about FinTech and are viewing it as potentially disruptive for the middle class.

One of the largest global banks, which operates FinTech incubators globally as well as in the Silicon Valley, suggested that the government: provide active support through easy to access grants, supportive policies and a regulatory sandbox; and provide passive support by eliminating roadblocks for innovation.

RentMoola recommended that the government provide support to help early stage FinTech development to offset the early stage funding crunch that many startups face. However, Payfirma's perspective was that if a startup develops innovative FinTech that is viable and serves the marketplace, government support isn't required.

A Toronto stakeholder recommended that governments get engaged in FinTech by collaborating with the private sector, to help build a FinTech ecosystem in Canada.

Iran's leading tech and FinTech startup publisher, Techrasa, noted that governments supporting co-working spaces has been a powerful method to grow innovation in Iran.

Thinking Capital recommended that the government participate in key FinTech conferences in Canada in order to build relationships. A global software firm recommended that the government engage openly and transparently with FinTech stakeholders, a view that was shared by stakeholders in academia. nTrust also recommended that the government become involved in key FinTech conferences in order to be "part of the conversation instead of on the sidelines." Koho recommended that the government engage in the FinTech space by making public statements that they support FinTech innovation and providing a conduit for FinTech startups to access government regulators, such as is available in the UK.

## Becoming a FinTech Leader

Based on the feedback from national and international stakeholders, the sentiment is that Canada currently lags behind Asia, the US and the UK in FinTech. FinTechHK, which operates an accelerator in Hong Kong, noted that FinTechs in Canada are being impacted by the lack of a national strategy, and the lack of policy initiatives for FinTech that exist in other countries.

Canadian stakeholders agreed that Canada can and should prioritize becoming an international FinTech leader, with the following specific feedback offered:

- Many stakeholders commented on the absence of the federal government as sponsors in Canadian FinTech initiatives, including key FinTech conferences that showcase Canadian FinTech talent.
- Innovate Finance offered these insights regarding the UK example:

*"... UK became a FinTech leader by fostering innovation and competition across the financial services sector and ensuring startups could access policymakers and regulators."*

Innovate Finance

- Stakeholders felt that Canada could become a FinTech leader by modeling its policies on strategies that have been successful in other countries, such as the UK and Singapore.
- Many recommended that Canada adopt a balanced regulatory approach that supports innovation.
- A global software firm noted that while Vancouver leads in "tech", Toronto leads in "Fin" and recommended that Canada recognize the distinction and adopt a cohesive strategy to build upon the strengths of each for a national cohesive FinTech strategy.

- APrivacy made the following suggestion:

*Canada should create and fund incubators, co-working or sharing spaces for startups and tech hubs to build FinTech and make it easier to attract people to Canada.*

APrivity

- FinTech HK suggested that Canada take steps to attract more capital and talent to become known in FinTech.
- Stakeholders suggested that Canada take a leadership role in the startup ecosystem by sponsoring a national startup challenge that funds many of the most innovative concepts generated from the challenge, similar to the national FinTech challenge launched by Singapore.
- The Kingdom of Bahrain, actively building a FinTech ecosystem, noted that because it has government support, there is tremendous potential for growth.
- A national bank said a deeper private-sector partnership is needed with the government in Canada. Others felt that Canada needs to fund startup centres for FinTech and support the ecosystem in an inclusive manner that includes all stakeholders, including women in FinTech.

## Bank Engagement in FinTech

Stakeholders had mixed perspectives on whether or not banks had embraced FinTech in Canada.

- Progressa, a Vancouver-based online marketplace lender, was of the view that banks have not yet fully embraced FinTechs.
- The chief digital officer of one of the largest global banks in the world remarked that sometimes there can be the perception that banks are not supportive of FinTechs, but the

reality is that many FinTechs develop great technology in a vacuum, without investing in understanding any of the regulatory or legal requirements of banks, and therefore create tech they can never sell to a bank or anyone else.

- A global software firm commented on the positive relationship that it sees co-existing between FinTechs and banks, and noted that the future will involve an ecosystem approach, whereby banks and FinTechs will collaborate and coexist, aligning on standards, approaches and security.
- FinTechHK believes that banks can support FinTechs in Canada by sponsoring conferences and co-working spaces, a model that has successfully launched FinTechs to profitability and towards significant investment in Hong Kong.

## Legal and Regulatory Issues

Stakeholders were asked to consider whether they felt regulatory or other legal requirements impacted the growth of FinTech in Canada. The responses were varied, but a number of respondents felt that Canada was lagging behind leading jurisdictions in regulation affecting FinTech.

- nTrust noted that Canadian regulatory rules “aren’t keeping up with today’s technology”.
- A global software firm said that the UK had adopted a balanced FinTech regulatory approach that supported its development as the leading FinTech centre of the world, a model that Canada could emulate.
- Stakeholders commented that where regulatory barriers exist, they can distort competition and discourage new entrants, denying consumers the benefits of new FinTech.
- The “regulatory sandbox” approach to balance regulation with innovation as adopted by several leading fintech jurisdictions (see “Regulatory Sandbox”, p. 44) was endorsed by Voleo, a Vancouver-based collaborative investment platform, Thinking Capital, a Montreal-based

SME online marketplace lender, and OnDeck, an international online marketplace lender to small businesses.

- Thinking Capital suggested that policy changes support the growth of this fast-evolving innovative space and be in the best interest of Canadians, noting that well-intended, but ineffective regulation could hamper the FinTech sector.

A Toronto stakeholder endorsed a balanced approach between regulation and innovation:

*“Canadian regulators across the board have a real opportunity to be a leader if a clear regulatory framework was implemented.”*

nanoPay, a Toronto-based FinTech that purchased Canada’s MintChip, drew attention to some of the securities law barriers to access capital, noting that the existence of multiple capital market regulators slows down the decision-making process and funding for FinTechs. This was echoed by FrontFundr, who commented on the fact that securities laws that vary from province to province make it difficult for FinTechs to raise money, a sentiment echoed by another Vancouver-based FinTech, Cassia Research. Wildeboer Dellelce LLP noted that the securities law regime continues to cause friction for FinTech.

A large global bank observed that when FinTechs put effort into working with professionals that service the banking industry to better understand banking architecture and laws, they will be better positioned to build solutions that support innovation within the proper regulatory regime. Many stakeholders recommended Canada adopt a regulatory sandbox to support the development of innovation. Such a sandbox removes regulatory uncertainty and allows FinTechs and financial institutions to innovate within legal pre-set parameters that take into account risks to consumers, risks to the financial services market, prudential concerns and risks posed by financial crime.

Wildeboer Dellelce LLP opined that startups in the innovation space need a legal regime that is “right-sized” in its approach to facilitate

capital raising while affording robust protections around areas such as intellectual property law.

A stakeholder noted that many FinTechs are operating with very little, if any, regulatory oversight or guidance and the lack of regulatory guidance inhibits growth and the uncertainty raises costs of investment in Canada.

## The Role of FinTech NGOs

Stakeholders felt that FinTech NGOs had an important role to play in relationship-building among industry and the government. A national bank believed that FinTech NGOs can provide leadership, competitive benchmarking and policy formation. Remillard Consulting, an Ottawa-based consulting firm, recommended that FinTech NGOs undertake research to address whether Canada is leading in FinTech, and could also be engaged to prepare best practices guidelines for private-public partnerships in FinTech and on collaborations between financial institutions and FinTechs.

In addition to the role of FinTech NGOs in helping to develop and frame policy and relationship-building, RentMoola, Witkit, nTrust and Thinking Capital thought that NGOs such as the Digital Finance Institute, could facilitate collaborative efforts among FinTech players nationally and help establish the “reputation of FinTech and its relevance with consumers, investors and stakeholders.”

Every stakeholder agreed that FinTech conferences in Canada are an essential part of creating and maintaining Canada as a FinTech leader. Payfirma noted that the networking and relationship-building opportunities provided by FinTech conferences are vital to every FinTech startup’s success and growth. Women In Payments added that there is important dialogue at conferences that takes place with regulators and investors, as well as incumbent FinTechs, that FinTech conferences help to drive, and recommended that the government support FinTech conferences.

Thinking Capital noted that conferences help FinTechs to collaborate, share knowledge and learn best practices that are important to sustaining and developing the ecosystem.

A global bank noted that because the space is evolving rapidly, national FinTech conferences are a crucial way for the sector to stay abreast of the technology and stay connected. This was echoed by StrategyCorp and Techrasa, which both said that in emerging areas, because the conferences are essential, noting that conferences foster an innovation culture.

## University Engagement

Most stakeholders, including Koho, 500 Startups, Women In Payments, nanoPay, APrivacy, and Remillard Consulting, strongly believed that university engagement is critical in Canada in FinTech, for both innovation development and to help Canada lead in entrepreneurship. Many stakeholders commented on the importance of STEM, including Techrasa, which noted the vital collaborative role universities fulfill in developing advanced tech. A university stakeholder significantly engaged in the space as an early entrant, said all universities should support efforts towards commercialization. Thinking Capital noted that there is a constant demand for engineers and developers, and that the wealth of R&D and applied tech from universities in Canada is essential to creating innovators in FinTech:

*“Engaging universities ensures that Canada produces qualified talent within the FinTech ecosystem and ensures university graduates have employable skills.”*

Thinking Capital

## The FinTech Association of Canada

Most stakeholders felt that the new FinTech Association of Canada would be the ideal vehicle to: liaise with governments to support FinTech; to help showcase Canada as a FinTech leader; and to drive FinTech investment in Canada. Thinking Capital also was of the view that the FinTech Association of Canada could serve as a facilitator to uncover opportunities for FinTech across Canada, and foster further innovation and creativity between government and the private sector.

A university stakeholder observed that startups with the best tech don't always succeed; rather, those with the best networks that can quickly figure out how to acquire customers and scale, tend to succeed. The way forward appears to include a forum that provides optimal networking on a national and international scale.

Stakeholders welcomed the new FinTech Association of Canada, with Payfirma recommending that in order to stay on track, the FinTech Association of Canada have a clear mandate, vision, and values, as well as a way to track and measures results. FinTechs generally expressed a desire that the FinTech Association of Canada become Canada's global voice and ambassador for growing the FinTech sector, and that it have a mandate to create partnerships and alliances with FinTech associations and governments around the world.

The launch of the FinTech Association of Canada was noted by several stakeholders as a promising vehicle to improve engagement between the government and industry. StrategyCorp recommended that the new FinTech Association of Canada become FinTech advocates and promote FinTech success stories to government, noting that:

*“FinTech has not hit a tipping point but the Association can do more to profile the industry with the media and decision makers.”*

StrategyCorp

Stakeholders supported the concept of co-working spaces administered by third parties (e.g., non-governmental organizations), a model that has worked exceptionally well to launch other FinTech jurisdictions.

*“We need visionaries to push things forward. There's no other way.”*

Sean Merat, WitKit Founder

## Canada as a FinTech Leader

### The Opportunity

The FinTech opportunity for Canada is vast. In terms of pure economic opportunity, according to research conducted by 500 Startups, the global FinTech market is largely untapped and estimated to be worth US\$13 trillion, equal to 17% of global GDP.<sup>249</sup> In addition to the US\$13 trillion economic opportunity from FinTech alone, embracing the ancillary area of artificial intelligence offers Canada a further US\$70 billion economic opportunity and biometrics, a further US\$30 billion (see “Ancillary FinTech” p.10). Moreover, FinTech is part of the knowledge-based economy and Canadian expertise and know-how in FinTech, once acquired, is exportable.

In addition to the obvious economic potential, leadership in FinTech gives Canada the ability to maintain a leadership role in global financial services as the sector undergoes disruptive changes, attract significant investment in technology in Canada, build tech talent, and open new trade opportunities to export FinTech talent and services to the global financial services market.

Financial services is undergoing transformative change as the world goes digital and automated. Those changes are expected to cause significant shifts in employment for the financial services sector, including shrinkage of employment in traditional financial services roles. An added factor in favour of FinTech is that it provides a growing job pool for Canada that can help offset job loss in traditional roles.

Those jurisdictions with active and vibrant FinTech ecosystems that create thousands of jobs, build talent and attract significant investment appear to have achieved this success in part because of a unified FinTech strategy supported by multiple stakeholder groups. We believe that Canada is well positioned to undertake a similar approach, with noted strengths and areas for further consideration and focus summarized below.

### FinTech Strengths

#### Strong FinTech Ecosystem

One of Canada’s biggest FinTech strengths, and particularly true of Vancouver, is the presence of a significant number of locally-based FinTechs. Equally important are the many leading tech companies with a presence in Vancouver – as technology and skilled tech talent are both essential to supporting a FinTech ecosystem.

British Columbia FinTechs are focusing on banking, payments, lending, investments, and wealth management, and a range of other financial technology streams. Among the thousands of tech startups operating in British Columbia are a growing number of FinTech companies making their mark both at home and abroad, including Koho, VersaPay, Moneris, TIO Networks, Payfirma, RentMoola, Grow, nTrust, Mogo, Witkit, ModernAdviser, Voleo, Lendful, Progressa, WealthBar and Frontfundr and many other startups that are ancillary to FinTech such as Trulioo. Vancouver is also home to Samsung Pay R&D and SAP, both global players in FinTech.

In addition, there are institutional FinTech leaders in British Columbia. The British Columbia government, through the British Columbia Lottery Corporation, has its own FinTech by virtue of its online gambling platform, Playnow.com. The British Columbia government is also exploring the development of smartphone technology to enable mobile identity authentication for an eventual seamless ID and government services program.

Another example is Vancouver-based Central 1 Credit Union, which provides FinTech services to certain financial institutions across Canada, including payments and mobile banking services. With 50% of its workforce dedicated to FinTech software solutions, Central 1 is among the largest technology businesses in Vancouver and an active supporter of FinTech in Canada.<sup>250</sup>

Although this FinTech Report in Canada is focused on Vancouver, British Columbia, Canada has FinTechs, banks and larger firms creating innovative products and services across the country and also has FinTech hubs evolving in other regions of Canada, including notably Toronto, Montreal, Waterloo and Ottawa. Montreal in particular, with its leading global position in electronic gaming and close-knit collaborative community, parallels Vancouver's strengths. Collectively, Canada's FinTech ecosystems present a powerful national opportunity, in particular if it can coalesce into a unified international presence.

### Leader in Tech

One key advantage Vancouver enjoys is a strong tech base. Technology is the third largest industry in the province, which has over 9,000 tech companies, including homegrown success stories such as D-Wave, Electronic Arts, Hootsuite and QuestUpon, as well as established international tech companies such as Microsoft, Sony Pictures Imageworks, Amazon and Facebook. The tech industry in British Columbia employs over 90,000 people and is growing at twice the rate of the province's overall economy.<sup>251</sup> In 2013, it generated over \$23 billion in revenue.<sup>252</sup>

The development of FinTech requires cutting edge technology and Vancouver, being a tech hub, offers much of the necessary skills and expertise needed to support FinTech. Experienced innovators are able to use their expertise in innovation to reinvent traditional businesses in brand new ways. Tech talent and experience gives FinTech startups in Vancouver a head start.<sup>253</sup>

British Columbia's tech leadership is also supported by the Government of British Columbia, which recently launched the #BCTECH Strategy, an initiative to support B.C. tech through capital, talent and access to markets. The capital component of #BCTECH Strategy involves a \$100 million investment for a fund focused on early stage venture capital funding for tech startups, although there are no non-venture capital funding or grants available.

To support acquisition and retention of talent, #BCTECH Strategy offers grants and funded research projects through the Knowledge Development Fund, and supports exports and sponsors accelerators to provide access to external markets.

While the implementation of the #BCTECH Strategy is in its early stages, it evidences the provincial government's commitment to growing and investing in the province's tech sector and commitment to make British Columbia a leader in the knowledge-based economy, which will in turn benefit the province's FinTech sector.

### Leading Jurisdiction for Business

For a combination of reasons, British Columbia is a leading jurisdiction for business, located strategically on the Pacific coast with access to markets in Asia. British Columbia has among the lowest combined federal and provincial corporate tax rate among the G7 countries, making it an attractive destination for startups and investors. Of special note are British Columbia's R&D tax credit and digital media tax credit, which make it a favourable jurisdiction to operate in terms of tax benefits for FinTech investors.<sup>254</sup> Not surprisingly, year after year, Vancouver is consistently voted among one of the top cities in the world to live, and one of the best cities in the world to do business.

FinTechs looking to operate in British Columbia also have access to an impressive pool of job-seekers to choose from. British Columbia is home to world-class post-secondary institutions and approximately 2.4 million well-educated, skilled diverse workers.<sup>255</sup>

British Columbia also has a well-developed corporate legal regime, that offers certainty and flexibility for businesses with national or international scope, including fully online corporate registry and no residency requirements for corporate boards. As a result of a concentration of FinTech businesses, Vancouver also has an expanding base of advisors with specialized expertise in FinTech both nationally and internationally.

### Leading Universities

British Columbia has numerous leading academic institutions, from the University of British Columbia and Simon Fraser University, to more specialized institutions such as the British Columbia Institute of Technology and the Centre for Digital Media. In addition, numerous leading research facilities are located in British Columbia, including Genome BC, TRIUMF, Canada's national laboratory for particle and nuclear physics and accelerator-based science, Wavefront, a centre

of excellence for wireless commercialization and research and D-Wave, the world leader in quantum computing. Many of these institutions and organizations have their own startup programs to assist entrepreneurs in commercializing their research and ideas.

There is an increasing engagement between universities and the tech and entrepreneurial communities to support and develop startup capabilities such as e@UBC and the SFU Venture Connection programs. The connection between academia and innovation is critically important, as noted by stakeholders (see “Stakeholder Views”, p.32). UBC, in particular, is a world leader in tech development in science, forestry, medicine, biotech and wearables, among others. SFU is offering an entrepreneurship focus across its curriculum.

Education and training, especially in STEM and digital technology disciplines is also a key component of building a skilled workforce that will be necessary to retain in Canada the technology jobs that are expected to displace many traditional financial services roles.

A key next step for university engagement in FinTech would be a nexus for FinTech R&D within local universities and FinTech-relevant education and training (including re-training) at local technical schools, colleges and universities.

### **Proximity to US Market & US Hubs**

With Silicon Valley and Seattle relatively close and in the same time-zone, Vancouver-based startups enjoy proximity to venture capital, mentorship and inspiration from south of the border. A number of tech companies from Silicon Valley have hubs in Vancouver and use Vancouver for development projects or longer term arrangements. A large number of startups in Vancouver are funded from Silicon Valley and, increasingly, Seattle or other U.S. hubs, where there is a deeper pool of early stage and venture capital and larger numbers of sophisticated investors and resources. In addition, the proximity of the US and Canada/US trade partnerships provides Canadian FinTechs with visibility to much larger market to scale, fundraise and potentially exit. Interestingly, recent data shows that corporate and strategic investment in FinTech increased significantly in Q2 2016 to one-third of total FinTech investment, demonstrating the increasing importance of access and visibility to

financial institutions and large industry players, not only for partnership opportunities, but also as a source of funding.<sup>256</sup>

### **Relationships with Asia & Middle East**

British Columbia is an ideal location for FinTechs and startups that want to partner or collaborate with businesses or investors in Asia and the Middle East. British Columbia has strategic alliances and cultural ties with Asia and the Middle East that are vital for international trade. British Columbia sends 44% of its exports to Asia, the highest percentage by far for any province.<sup>257</sup> British Columbia is also a key hub for Canada-China trade, and known as Canada’s “Pacific Gateway” because of its geographic situation between the US and Asian markets. In 2007, British Columbia launched the Asia-Pacific Initiative, which, among other things, positioned British Columbia as North America’s Asia-Pacific destination.<sup>258</sup>

Not only does British Columbia’s location on the Pacific coast put it in closer proximity to the Asian market, but it also sees a steady influx of Asian and Middle Eastern immigrants, which helps sustain the pool of technology and business talent. The large number of immigrants in British Columbia also means that its remittance market is one of the largest in the world, providing significant opportunities for FinTech startups seeking to enter the remittance sector.

British Columbia has a significant business and trading relationship with the Middle East. Canada substantially increased its trade presence in the Middle East over the past few years, with exports to the region growing by 168% and imports by 200%. However, Canada still has opportunity to grow in respect of its trading commitments with the Middle East, which accounts for an increasing percentage of the world’s economic output: accounting for 5.13% in 2011, up from 4.3% in 2002.<sup>259</sup>

The geographical position of Vancouver gives it an unparalleled advantage for trade and importantly, for FinTech to scale and exit not only to Asia but increasingly, to the Middle East.

## National FinTech Initiatives

Canada has several national FinTech initiatives that have helped to organically build a national ecosystem. A key element in building a national ecosystem is national forums to showcase FinTech innovation. An example of this are the national “startup challenges” launched by Ottawa-based Payments Canada and the Vancouver-based Digital Finance Institute. Known as the “FinTech Cup”, the first was hosted at the national Payments Panorama conference in Calgary in June 2016, with the BC Tech Association also partnering. The FinTech Cup provided five finalists with an opportunity to compete for a \$25,000 prize and provided a national startup platform to support FinTech development. In the Fall of 2016, the Digital Finance Institute is launching an international FinTech startup challenge in artificial intelligence and financial inclusion in order to jumpstart entrepreneurship and create innovation at the university level in Canada with participation from Deloitte, the Bill and Melinda Gates Foundation, Tilt and the Ontario Government.

Canada’s private sector launched the annual FinTech Awards in 2015 to recognize FinTechs, innovators, advisors, financiers and other key stakeholders that have helped to build Canada’s FinTech ecosystem. In 2016, the 2<sup>nd</sup> annual [Canadian FinTech Awards](#) will take place in Toronto on November 21, 2016, with expanded awards and judges from a wide range of organizations including OMERS Ventures, IBM, the Business Council of Canada, the Ontario Government, the TFSA and CIBC.

National conferences are also a key way to create a national ecosystem to support Canadian FinTech. Stakeholders overwhelmingly agreed that FinTech conferences are essential to creating and maintaining Canada as a FinTech leader because of the networking and relationship-building opportunities, and the introductions to financiers that result in investment at each conference. Conferences also help FinTechs create a dialogue both with each other and other stakeholders in the financial services sector. Because of conferences, stakeholders are able to share knowledge and stay abreast of the changes in technology, and ultimately foster a culture of innovation and collaboration.

Canada has been home to numerous FinTech conferences. To date in 2016, #FinTech2016 was hosted by the Digital Finance Institute in

Vancouver; the Canadian FinTech Summit was hosted by BDC IT Venture Fund and the MaRS Discovery District in Toronto and #FinTechTO held by the Digital Finance Institute in Toronto in August 2016. Upcoming events include the Canada FinTech Forum on September 2016 hosted by Finance Montreal in Montreal, and CIX Fintech Day in November 2016.

## FinTech Association of Canada

The FinTech Association of Canada informally launched in Vancouver in the winter of 2016. One of the challenges facing Canadian FinTechs is a lack of ability to engage with government and to collaborate at the national level. The goal of the FinTech Association of Canada is to provide a united voice for Canadian FinTech and engage with government with a view to fostering innovation, align interests, attract investment, highlight Canadian FinTech success. An alignment with global FinTech associations through the Global FinTech Hubs Federation, a joint initiative of SWIFT and Innovate Finance and a number of international FinTech Hub organizations is underway with a shared agenda to support trade missions, support for each country’s national conferences and to assist with financing and foreign government introductions.

## Leaders in FinTech Diversity

One of the key, yet underreported issues faced by the FinTech sector today is lack of diversity. A recent study found that while FinTech may promise a bright future for financial services, FinTech firms are trailing behind the financial services sector when it comes to diversity at the top; Women occupy fewer than one in 10 board seats across the top 50 UK FinTech businesses compared to one in four across businesses listed on the Financial Times Stock Exchange.<sup>260</sup>

Canada has taken the initiative in promoting diversity in the FinTech ecosystem. Last year, the Digital Finance Institute, along with SWIFT and Innotribe published the first white paper on the topic titled “The Power Women in FinTech Index, bridging the Gender Gap”, which highlighted the reality of today’s situation in FinTech and provided recommendations to achieve and accelerate greater gender balance within the FinTech sector.<sup>261</sup> The White Paper was the most downloaded document from SWIFT’s website. The Digital Finance

Institute is the co-creator of [FemTechLeaders.com](http://FemTechLeaders.com), the only website profiling and supporting the leading women in FinTech.

The Digital Finance Institute makes it a priority to have women represented as speakers at its conferences: for example, approximately half of the speakers at the FinTech2016 Conference held in Vancouver in April 2016 were women. The Digital Finance Institute and McCarthy Tétrault LLP also co-hosted an event celebrating Women In Fintech in conjunction with #FinTechTO in August 2016. Such initiatives promoting and highlighting diversity in FinTech help support Canadian entrepreneurs and innovators, generate goodwill for Canada's FinTech sector and help to create alliances with financial services sector globally. It also will become critically important in the formation of inclusive artificial intelligence solutions (see "Artificial Intelligence, p. 10).

### Collaborative FinTech Community

Compared to leading FinTech jurisdictions such as the US and UK, Vancouver's FinTech ecosystem can be described as small and collaborative, but with a global focus. Vancouver has a unique FinTech ecosystem, insofar as it has not traditionally had the benefit of significant government or global bank-subsidized FinTech centres or FinTech innovation labs. The growth of the Vancouver FinTech ecosystem has seemingly occurred more organically than in other leading jurisdictions. .

FinTech start-ups are in closer proximity in Vancouver than their Toronto counterparts, which appears to allow them to collaborate more readily and form a more supportive and tight-knit community.<sup>262</sup> Vancouver also offers great lifestyle appeal, which can help attract top talent to the city. Proximity to the Silicon Valley offers significant opportunities for cross-border collaboration and financing, while proximity to Asian markets allows the Vancouver FinTech community to expand their reach globally.

### Areas for Further Improvement

Based on stakeholder feedback, key impediments to Canada and British Columbia becoming leading global FinTech jurisdictions are: lack of sufficient funding, difficulties attracting and retaining talent,

regulatory uncertainty and a lack of a favourable regulatory regime, and lack of international profile for Canadian fintech.

To help resolve these impediments, further focus and stakeholder support is needed in the following key areas.

### FinTech Innovation Centres

Canada has a relatively small number of FinTech accelerators and incubators that bring FinTechs together to create business opportunities, provide support for start-ups and encourage collaboration.

Some of the FinTech incubators and accelerators which operate in Canada, include Thinkubator; the DMZ, Canada's top university business incubator open to tech startups worldwide supported by Ryerson University; the Ontario government's MaRS program, which rents shared space; OneEleven, which accelerates startups privately; and Communitech in Waterloo.

In Vancouver, the BC Tech Association has a FinTech cluster with PayPal to facilitate collaboration between FinTech companies and offer mentoring, programs and workshops to support growth.

The Digital Finance Institute aims to create government-supported co-working spaces in Vancouver and Toronto where small FinTech companies can interact and innovate, and receive mentorship from Canada's leading lawyers, financiers, accountants and other professional advisors, a model that is successfully used in the UK, Hong Kong, Israel, Iran, Singapore and France to launch the world's top FinTechs.

Of the accelerators and incubators and other hubs that currently exist, there appear to be pros and cons to the various models. Some stakeholders suggested that non-profit accelerators and incubators have insufficient resources to support FinTech startups on their own, while others critique for-profit programs for charging prohibitive fees to join their programs or insisting upon an equity stake in participating startups. The startup visa program was critiqued as involving both prohibitively high costs, as well as equity demands that chase away foreign entrepreneurs.

## Funding

Increased funding is generally regarded as critical for the advancement of FinTech innovation, and both government and private funding sources will be instrumental in allowing Canadian FinTech companies to continue to innovate, collaborate and capitalize on market opportunities.

Nearly all stakeholders in this FinTech Report identified access to funding, or lack thereof, as a key factor limiting the expansion of Canadian FinTech. Survey respondents consistently noted a lack of government funding, including a lack of grants. While Canada and British Columbia do offer a number of funding, grants and tax credits for technology companies, there may be a lack of awareness that is impeding ability to access these funds, and insufficient funding programs specifically available to all FinTech business models that creates the issue.

Globally, in Q2 2016, VC funding for FinTech is down 49% over Q2 2015, however overall funding in 2016 remains on pace to surpass 2015.<sup>263</sup> The vast majority of this funding, however, is from the U.S., Asia and other international markets, while the pool of Canadian capital remains relatively small, necessitating the need for Canadian-focused funding support and access to international markets for broader funding needs.<sup>264</sup>

## Regulatory Roadblocks

Stakeholders raised concerns about Canada's current regulatory regimes, which present some uncertainty for FinTechs as to what activities and business models will be regulated and how, in light of Canada's multi-faceted regulatory regime (see "FinTech Law" page 15). Canada, much like the U.S., has overlapping levels of regulation between the federal government and multiple provincial governments, and has different regulatory bodies responsible for different elements of the financial system, including financial regulators, securities regulators, consumer protection regulators and privacy regulators. Financial institutions, on the other hand, have certainty as to the application of regulation to their activities, but also the resulting regulatory requirements and obligations, which can pose challenges to fostering innovation and agility. There has been progress in harmonization of regulation in Canada, with securities

regulation being one notable example, however it has been a relatively slow process and not yet fully achieved.

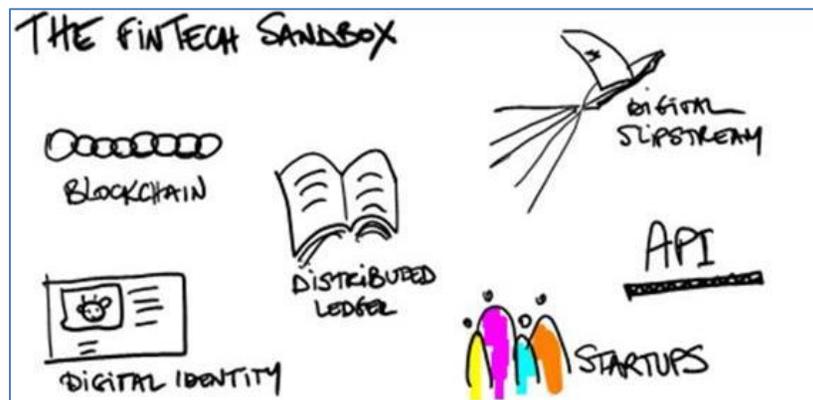
Stakeholders also expressed concern that regulations in Canada have not kept pace with innovation, which can result in regulatory regimes that are unintentionally inflexible to new business models because they were not drafted to contemplate current technology, and therefore hamper innovation. There are examples of some modernization in Canadian the Canadian regulatory regime, including recent amendments to the AML regime related to identification requirements, and the guidance periodically published by the Canadian Privacy Commissioner on a variety of digital data privacy issues, however there is room for further progress in harmonizing and modernizing our regulatory regimes.<sup>265</sup>

Although there was concern amongst some FinTech stakeholders regarding the barriers of regulation, as much or more concern was expressed regarding regulatory uncertainty that can hamper innovation in the early stages, due to the higher risk and increased costs. While relaxed regulation is viewed as very beneficial in the early stages to foster innovation and the development of technology and building of mutually beneficial partnerships, it does not preclude the application of full regulatory obligations at an appropriate stage. An interesting development in this regard is the market study being undertaken by the Competition Bureau regarding the impact of FinTech on financial services and considering the need for regulatory reform.

## The Regulatory Sandbox

In addition to regulatory certainty, many stakeholders were of the view that Canada would benefit from the implementation of a "regulatory sandbox," which is a concept largely credited to Kosta Peric of the Bill & Melinda Gates Foundation.<sup>266</sup> A regulatory sandbox is a process whereby laws are effectively temporarily suspended, or relaxed, in respect of certain financial transactions or business lines in order to support the development of innovation. Within a regulatory sandbox, FinTechs could conduct certain financial transactions and provide services within threshold limits to allow them to innovate in a cost effective manner while protecting consumers (for example, by limiting risks) and importantly, protecting the integrity of the financial system from, among other things,

financial crime. As FinTechs become larger and better financed, they are then released into the full regulatory system and then required to fully comply with financial regulation. Financial institutions may be able to better explore partnerships and innovative solutions, thereby increasing the ability to innovate.



Source: Kosta Peric, Gates Foundation, Digital Finance Institute Conference<sup>267</sup>

In Canada, such a regulatory sandbox, or legal bubble model, does not currently exist. Several jurisdictions have variations on this type of model in place, including the UK, Singapore and Australia. The US is looking at a similar approach in order to support “responsible innovation”. Although the approach varies in each jurisdiction, the intended effect is the same: FinTechs and financial institutions are allowed more freedom to innovate pursuant to a relaxed regulatory approach, provided they are responsible vis-à-vis the law, meaning that they take obligations in respect of money laundering, terrorist financing, sanctions, privacy and consumer protection seriously and comply in respect thereof. The UK is now also moving towards adoption of the US model of “responsible innovation.” Although not termed as such, Iran also has a regulatory sandbox to support the growth of its tech (see “Iran”, p. 24). Although there are variations on the approach in each jurisdiction the goal is similar.

There is strong evidence to suggest that regulatory sandboxes were critical in the development of leading FinTech ecosystems such as the UK and Singapore. While Australia had a somewhat slower start in FinTech compared to the UK, it is now taking significant steps. In March, 2016, the Australian government launched a national plan to

develop the Australian FinTech market which includes a regulatory sandbox for FinTech startups which would grant waivers from certain regulatory requirements to support the growth of innovation in financial services.<sup>268</sup>

Certain global banks, such as Deutsche Bank, have endorsed a regulatory sandbox concept because it also provides them with the flexibility to test new ideas away from their infrastructural and cultural constraints, and sidesteps certain obstacles to innovation which may exist.<sup>269</sup>

This type of “legal bubble” can work for FinTech as a mechanism to balance innovation and regulation if designed properly. Based on current successful examples, such as the United Kingdom, a key element of a regulatory sandbox is the proper design of its legal framework, often done by regulatory lawyers and other experts, knowledgeable in both the jurisdiction’s financial regulation and FinTech. This ensures its proper functioning and that concerns such as financial crime are addressed from a legal perspective to provide certainty for financial institutions and FinTechs alike.

A further benefit is that the regulatory certainty provided by a regulatory sandbox makes investment in FinTech a less risky proposition, and thus it often acts as a catalyst for new investment. Finally, a regulatory sandbox offers protection for FinTechs, financial institutions, consumers and the financial system, balancing innovation and the legal compliance.

## R&D

Canada ranks 19th on the global ranking of innovation, scoring especially low on R&D, behind South Korea, Germany, Sweden, Finland, Singapore, Israel, France, UK, US and Austria.<sup>270</sup> Moreover, although four Canadian cities placed in the top 25 of a ranking of startup ecosystems in 2015, Vancouver was among the cities that declined the most since the same organization’s 2012 ranking.<sup>271</sup>

Among the reasons cited for Canada’s declining innovation prowess is that there is a lack of a proper ecosystem, with a few heavyweights (or former heavyweights) like Nortel, BlackBerry and Bombardier being viewed as responsible for most of the tech

development. Canada's SMEs also tend to have lower export tendencies than other G7 economies, and under-invest in innovative technologies. It has been noted by some observers that Canadian governments and financial institutions may be slower to adopt innovative products and services, due to a cultural aversion to risk.<sup>272</sup>

Although Canadian governments support innovation through tax credits such as the SR&ED program, more is needed to help bring the strong tech developed by beneficiaries of SR&ED credits to market. Suggestions from industry experts have included, among other things, a non-refundable grant program for startups to offset a portion of their early stage development costs and a corporate grant program that supports industry strategy and requires academic-corporate partnerships to develop disruptive innovation.<sup>273</sup>

### Government Support

Government plays a critical role in the development of Canada's FinTech sector, through its role in setting the agenda for advancing a knowledge-based economy, regulatory engagement and providing resources to support innovation. As a supplement to the current funding, programs and other resources for technology innovation, tailored support from Canadian governments would provide a boost for Canadian FinTech as there is a sense amongst stakeholders that more support would be beneficial. A national initiative in support for innovation in FinTech and ancillary FinTech, similar to that undertaken in the UK and Australia, will also be an important component of Canada's FinTech success. This type of initiative will raise the profile of Canadian FinTech achievements and talent to enhance both the domestic and international markets for Canadian FinTech.

Stakeholders generally agreed that governments in Canada can support the FinTech sector in four key ways: (1) investing in Canadian FinTech, both with respect to capital and talent; (2) supporting FinTech co-working spaces in accelerators; (3) creating a "regulatory sandbox," similar to those created in other leading FinTech jurisdictions; and (4) helping establish both a national and an international FinTech presence so that Canadian financial innovators (whether financial institutions or FinTech firms) are able to capture a significant portion of the domestic and global markets and maximize opportunities for partnerships, investments or acquisitions.

## Roadmap to Leadership

The global financial system is undergoing significant transformation with the advancement of new and innovative financial technologies. Canada, and in particular Vancouver, with its existing tech leadership, favourable business environment and geographically advantageous position for trade and commerce with the US and Asia, has incredible potential to be a global FinTech leader. A number of players, including FinTechs, tech companies, service firms, government agencies, leading universities and financial institutions are already establishing a common foundation on which to build a FinTech hub in Vancouver.

Positioning a city as a FinTech hub requires the ability to attract the attention of international investors and businesses looking for the right place to invest their money. Vancouver already is a leader in many FinTech niches, such as payments, remittances and artificial intelligence, and is home to many leading global tech companies, including Microsoft, Samsung Pay, Amazon, Facebook, Sony Imageworks, D-Wave and SAP.

Vancouver has a clear opportunity to be a FinTech leader and join the leading global FinTech centres of London, New York and Singapore, particularly given its leadership through the FinTech Association of Canada, which is aligned with similar associations under an umbrella global federation to support FinTech international trade and networking, and to provide meaningful opportunities to scale.

In order to capitalize on this, the road to leadership requires a strong collaborative effort from private and public stakeholders, as well as more capital in the form of grants, better access to talent and increased political attention and support, including a regulatory sandbox and a cohesive national FinTech initiative to “brand” Canadian FinTech.

Year after year, Vancouver is consistently voted among one of the top cities in the world to live and one of the best cities in the world to do business. It attracts a great number of international businesses and creates thousands of new jobs, emerging as a tech leader. Leveraging these advantages with a national FinTech strategy will enable Vancouver to lead the global financial technology transition.

### FinTech Start-ups:



Get engaged in, and support events focused specifically around FinTech to share knowledge, experiences and grow the FinTech ecosystem. In addition to the larger conferences or higher profile events, FinTechs should consider relationship-building with larger international stakeholders, to gain from their perspective on the sector and to help build connections to scale and eventual international market access.

### Public Bodies



Acknowledge the potential of FinTech and develop a strategy to make Canada and British Columbia a FinTech leader with a FinTech brand. Nationally, attend and support the key FinTech conferences and support the engagement of the dialogue internationally with industry organizations. Consider legal policies to balance innovation with the law, such as with a regulatory sandbox. Allocate grants for funding FinTechs and support of financial innovation and diversity.

### Private Sector:



Provide mentoring and networking opportunities to help entrepreneurs and startups in the FinTech space. Provide access to capital talent and consider forming partnerships with FinTechs to support the creation of innovation in Canada and provide financial support for innovation development. Consider partnerships with the private sector to help build Canada's FinTech brand. Liaise with the FinTech Association of Canada for a deeper integration in the FinTech ecosystem in Canada.

### Universities:



Leverage their expertise in specific fields such as science, computer science, technology and law to provide academic support and research for FinTech and development.

## Authors & Contributors

### About the Authors

[The Digital Finance Institute](#) is a prestigious Canadian-based think tank for FinTech established in 2013 with a mandate to address the balance of innovation and regulation; support initiatives for financial inclusion; and advocate for diversity in FinTech. The Digital Finance Institute also promotes FinTech in Canada through conferences and international alliances; the creation of Canada's national FinTech Awards; the FinTech Cup, the new university FinTech startup challenge and by preparing research papers on FinTech.

The Digital Finance Institute has, among other things, created with NTT Data, [FemTechLeaders.com](#), which promotes diversity in FinTech around the world and features leading women in FinTech and spearheaded the formation of the national FinTech Association of Canada.

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[McCarthy Tétrault LLP](#) is an innovation focused Canadian national law firm with an integrated FinTech practice that offers leading multi-disciplinary expertise in financial services regulation, consumer protection, securities regulation, anti-money laundering, cybersecurity/privacy and lending, and extensive transactional, cross-border and technology expertise. McCarthy Tétrault is a proud co-sponsor of the launch of the FinTech Association of Canada and the Digital Finance Institute's Women in Fintech initiative.

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