Form Fintech

FINTECH ACCELERATOR

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FormFintech and Holt Accelerator would like to thank and congratulate the Department of Finance for this initiative in asking the Canadian Ecosystem to share their thoughts on Open Banking.

If you have any questions, or require any further information, please don't hesitate to let us know.

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Methodology

Open banking is a vast topic with numerous moving parts involving multiple stakeholders. As a result, instead of creating a list of potential actions, which could not have been exhaustive, we focus on properly defining underlying problems in areas that are of interest to the federal government and provide a macro-level view on strategy and directions. Our goal throughout has been to provide evidence for our hypothesis, arguments, and recommendations. To that effect, we have referenced 50+ articles, research paper, and books.

We provide recommendations on the strategic perspective and mindset the government needs to employ, so as to play a role that advances innovations without sacrificing issues pertaining to consumer protection. In some cases, we have used strategies that are common among startups, such as “beachhead” methodology that advocates identifying high-impact yet low-risk entry points to effectively initiate a project. Approaching challenges from the advocated agile perspective allows all stakeholders to advance and learn at the same time, leading to the creation of products, services, and ecosystems that are molded, to the highest degree possible, for the needs of the consumer.

Furthermore, to understand the general sentiment of the public towards the subject of open banking, FormFintech and Holt Accelerator conducted a survey among members of the fintech community. A series of discussions to understand the underlying assumptions that led respondents to these answers succeeded in the survey. We deliberately used answer options that are not mutually exclusive and allowed respondents to choose more than one multiple

choice. The survey was conducted among 43 respondents aged 20 to 60 years old, including but not limited to working professionals, students, startup founders, and government officials[1].

[1] FormFintech understands that this sample population is not representative of the general populaion, since the sample size is small and non-homogenous.

Question 1

Would open banking provide meaningful benefits to and improve outcomes for Canadians? In what ways?

To provide a comprehensive analysis, we discuss direct benefits that consumers would receive through the development of new products and indirect benefits through a more competitive and technologically advanced banking sector. This section aims to properly define problems with Canadian banking and relate open banking towards providing a solution to those challenges.

Key Problems

- *Consumer needs are changing due to customer-centric products and services provided by bigtechs. As a result, they are looking to get more from banks.*
- *Banks in Canada, and around the world, are slow to innovate due to multiple reasons, which serves as an impediment to providing products that consumers need.*
- *Even in developed nations such as Canada, underserved groups, markets or needs exist in the financial services industry.*

Q1.1 Consumer Needs are Changing

With the coming of tech giants that are customer-centric to the core, consumers expect more from all sectors of the economy. The World Fintech Report (2017) published by Capgemini states that "Powerful BigTechs like Google, Amazon, Facebook, and Apple have raised the bar of customer expectations by delivering superior personalized and digital customer interactions".

The same report states "By margins ranging from about 25 to 60 percentage points, executives thought that fintechs provided a better experience than traditional firms in convenience, user experience, transparency, timely and efficient service, as well as better value for money." Furthermore, "Fintechs have made headway into financial services, bringing new skills, expertise , and agility. Close to two-thirds (62.7%) of executives say fintechs are setting the bar higher for the entire industry. While 43.1% of executives agree that fintech firms pose a significant threat.".

According to a report published by Ernst and Young[2], fintechs are gaining market share and consumer confidence because they are targeting areas such as online experience and functionality, access to different products and services, easy to set up accounts and better quality of service; features that are highly valued by the modern day financial services consumer. And with open banking, they will be able to create much better products in all areas.

A fact that is supported by an article posted by The Financial Brand. It states that an effective open banking system will not be possible without a solid API system underlying all processes. APIs that will lead to multiple benefits such as increased agility, reduced time to market for products, new products, and services, among many others. While this may be a new concept in the banking industry, the fact that APIs lead to enhanced speed is well known in the broader tech community[3].

[2] Unleashing the potential of FinTech in banking (2017), Ernst and Young
[3] How APIs Fuel Innovation, 2013, Wired Magazine

An additional benefit would be that tech giants such as Apple, Google, Facebook will be able to plug into these systems and provide financial products in tandem with already existing customer-centric platforms. Something that is already happening in China with WeChat. Though this might lead to issues pertaining to the transfer of data across borders, an issue that will be discussed in Section Q2.3.

Open banking will lead to better products and services due to APIs and further empower fintechs that are already supplying services that consumers resonate with.

Q1.2 Lack of Competition

Banks are slow to innovate. According to the report “Why Aren’t Banks Getting More from Digital?” published by the Boston Consulting Group, banks face a “slow-delivery” problem due to complex legacy IT that hinders progress, data architecture that is inadequate to support digital propositions and journey, key talent gaps in the digital customer experience, data, and analytics teams, plus organizational resistance to changes that threaten the status quo. The Disruption House, an advisory firm, also produced a report that explains why banks fail to grasp innovation. The report collected information from 150 financial institutions and came to similar conclusions. It, thus, comes as no surprise that tech giants such as IBM, Google and Microsoft hold 10 times more fintech patents than the world’s 15 largest banks put together[4].

Additionally, Canada's banking system is unique and different from most banking ecosystems in the world. Based on a Scottish system that was established almost a millennium ago, it is highly regulated and functions such that there are only a handful of financial institutions that cater to

[4] Tech Giants Lead the Way on Fintech Patents, Ahead of Banks, 2018, IP Watch Dog

most of the population. Specifically speaking, the big 6 account for 90% of assets invested in Canadian retail brokerage accounts[5].

This has both positive and negative consequences. On the one hand, the presence of high barriers to entry in the form of stringent regulations leads to one of the most robust banking systems in the world, which is why Canada didn't experience as big downfall as other countries (i.e. USA) during the 2008 financial crisis[6]. On the other hand, it leads to limited competition or oligopolistic competition which, and modern economic theory would agree, hampers the development of new products and services.

Canada, overall, is struggling when it comes to innovations capabilities. Its ranking on the global indices is the lowest since 2008 and 2011, indicating that the gap between Canada and the developed world is growing. Canada's ranking on the Global Competitiveness Index when it came to innovation specifically was No. 23 in 2017-18, a drop from a peak No. 11 in 2010-11. On the Global Innovation Index, Canada ranked No. 18, down from No. 8 in 2011[7].

Furthermore, according to research performed by Relecura in 2015, the US is the most active market based on fintech patent filings with 45,410 patents, followed by Japan with 16,978 patents and Korea with a total of 9,902 patents. Canada stood at 6th position with 4,596 (1/10th of the patents in the US and ½ of those filed by its immediate forerunner). One can argue that these figures make sense as Canada is 1/10th the size of the US, but a study conducted by Center of International Governance Innovation states that most of the fintech patent filings in Canada are done by international firms, To be more precise, of all Canadian

[5] Royal Bank of Canada; Investment Industry Association of Canada; Investor Economics
[6] Why Didn't Canada Have a Banking Crisis in 2008 (or in 1930, or 1907, or .)? (NBER Working Paper No. 17312)
[7] Innovation in Canada: An Assessment of Recent Experience (published in 2019), Fraser Institute

Patents granted in 2016, 87.4 percent were foreign owned[8].

We are talking about patent filings not to imply that open data will lead to more patent filings but to illustrate how weak the Canadian Banking industry is in terms of innovation. And the primary reason for this is the lack of competition, which causes Canadian banks to stay in a "comfort zone."

Open banking could be a solution as it would drive competition by mitigating one of the main advantages enjoyed by banks: access to data on consumers[9]. Additionally, an increase in competition would lead to a reduction in a bank's ability to cross-subsidize; thereby leading to a reduction in profits which act as an incentive to innovate[10].

Through open banking, the playing field will level as fintechs will have the necessary data to build products, That will accelerate the speed of financial innovations, making Canada more competitive on the international landscape and enhancing overall benefits for consumers,

Q1.3 Underserved Markets

Even though 99% of the Canadian population has access to a bank account, underserved markets still exist in certain demographics for certain financial products.

According to National Aboriginal Capital Corporations Association (NACCA) and the Business Development Bank of Canada (BDC) report published in 2017 "…. the vast majority of

[8] Issues in Bringing Canadian Fintech to the International Stage, Policy Brief No. 111, 2017, James W. Hinton, Domenico Lombardi and Joanna Wajda, Center of International Governance Innovation
[9] How to flourish in an uncertain future Open banking and PSD2, 2017, Deloitte
[10] Why Don't Banks Innovate?, 2013, The Financial Brand

Aboriginal communities do not have a bank within their boundaries. Notably, as of this year, the four major banks in Canada (i.e., the Royal Bank of Canada, the Bank of Montreal, the Canadian Imperial Bank of Commerce, and Scotiabank) collectively have less than 50 Aboriginal branches, banking outlets, or banking centers located on-reserve. Amongst the many impacts of this, individuals who have limited access to mainstream financial institutions often have no or poor credit scores, which exacerbates the challenges of accessing financing from these institutions."

As of April 1, 2018, Statistics Canada's preliminary estimates put Canada's population at 37,067,011. The 2017/2018 migration increase into Canada was the highest ever measured in Canada's history, accounting for 79.6% of population growth in the period. In total 303,257 immigrants entered the country during this time.

New immigrants to Canada, however, face one big obstacle while accessing financial products: an absence of credit history. This is particularly true for those who want to set up their own business[11]. An unfortunate situation as Statistics Canada figures indicates that newcomers tend to be drawn to entrepreneurial activity[12].

Data also suggests that the new entrant's segment is highly lucrative as 95% of newcomers hold at least one credit card (with very low credit limits and through collateral) and have a strong belief that access to credit is important to manage finances[13]. Entrepreneurs, south of the

[11] Despite working at a bank, this immigrant entrepreneur struggled to get financing, 2016, Globe and Mail

[12] According to a 2013 Government of Canada report, 21.7% of small to mid-sized enterprises had a majority owner or CEO born outside of Canada

[13] Financial Services Among New Canadians Syndicated Study, 2016, Environics Research

border, were quick to identify this problem and develop solutions by pulling data from international credit bureaus[14].

Startups like Deserve and Petal, as an example, have their own credit scoring systems that evaluate an applicants' creditworthiness based on factors such as income, expenses, etc. In most cases, they use banking information, which will be much easier, seamless and efficient to obtain through an open banking system. While most think that open banking is a one-way street where fintechs benefit from access to data, it could also work in the other direction where banks tap into alternative credit scoring systems to judge a person's creditworthiness and extend loans.

Fintechs can also provide products to small businesses that make up 98% of total businesses in Canada[15]. In fact, many startups are already using artificial intelligence to speed up the loan approval process[16]. These AI processes and algorithms are likely to develop further when fintechs gain direct access to a business' financial statements and other relevant information.

This is highly beneficial for the economy as increased small business lending leads to a multiplier effect because small businesses can hire more people, which leads to an increase in spending and higher consumer demand leading to the creation of more businesses[17]. There are many other examples of underserved markets (or rather needs) such as point-of-sale financing, travel insurance, and investment advisory that fintechs are looking to service.

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[14] Fintechs find another untapped market: New immigrants needing credit, 2018, American Banker
[15] Importance Of Small Business In Canada, 2011, Ms. Joyce Murray
[16] Will AI give small-business owners, fintechs a leg up--or reinforce status quo? 2018, FInancial Post
[17] Report: Online Lending Empowers U.S. Small Businesses to Generate 358K Jobs and $40 Billion for the Economy Over Three Years, 2018, PRNewswire

WIth open banking, fintechs will be able to access data allowing them to create products for underserved markets, that will not only serve individual needs but also accelerate the pace of economic growth.

Q1.4 Survey Results

It was interesting to observe that most respondents had an optimistic view of open banking. On a scale of 1 to 10, with 1 stating that open banking will cause harm and reduce overall well being and 10 being open banking will change the world for better. The average score was more than 8, indicating an overall positive view of open banking.

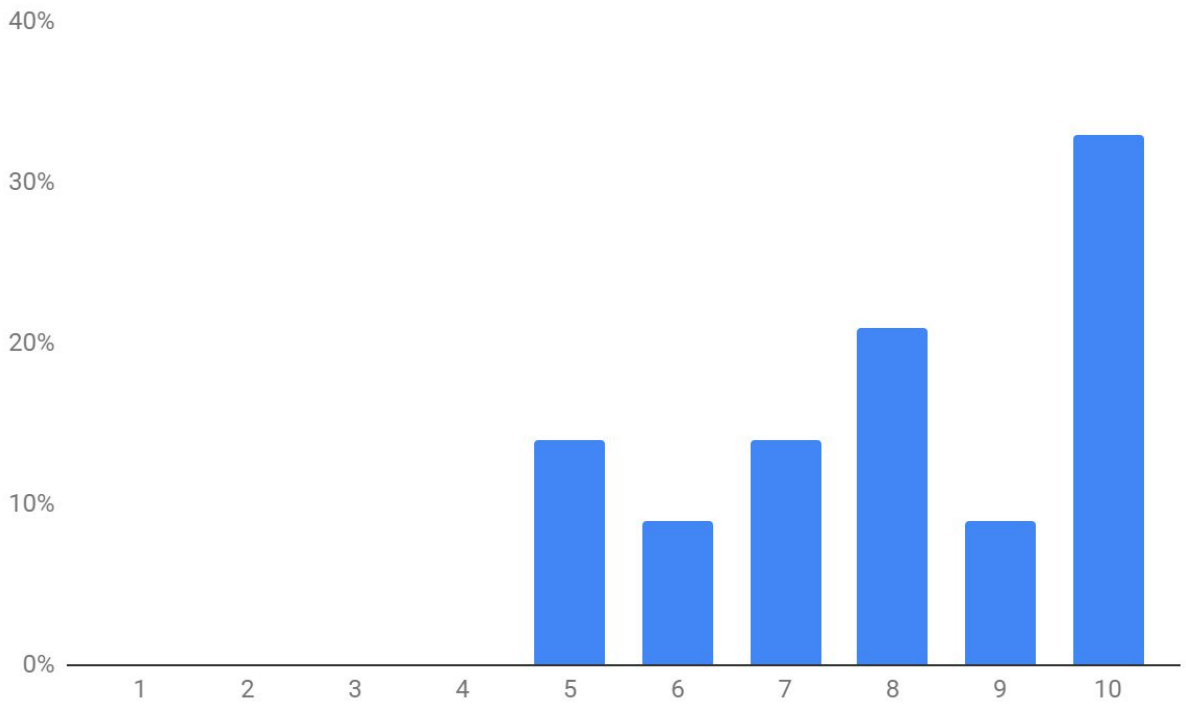

Figure 1. Survey results showing the sentiment of respondents towards open banking. 33% of respondents think that open banking would change the world and none of the respondents gave a score lower than 5.

This positive view could stem from the belief that open banking will solve two major pain points: data ownership and lack of competition among banks.

Even though respondents understood the benefits they would receive from improved services resulting from open banking, they were equally excited about the fact that open banking will allow them to own their data and decide who can monetize it. (Figure 2).

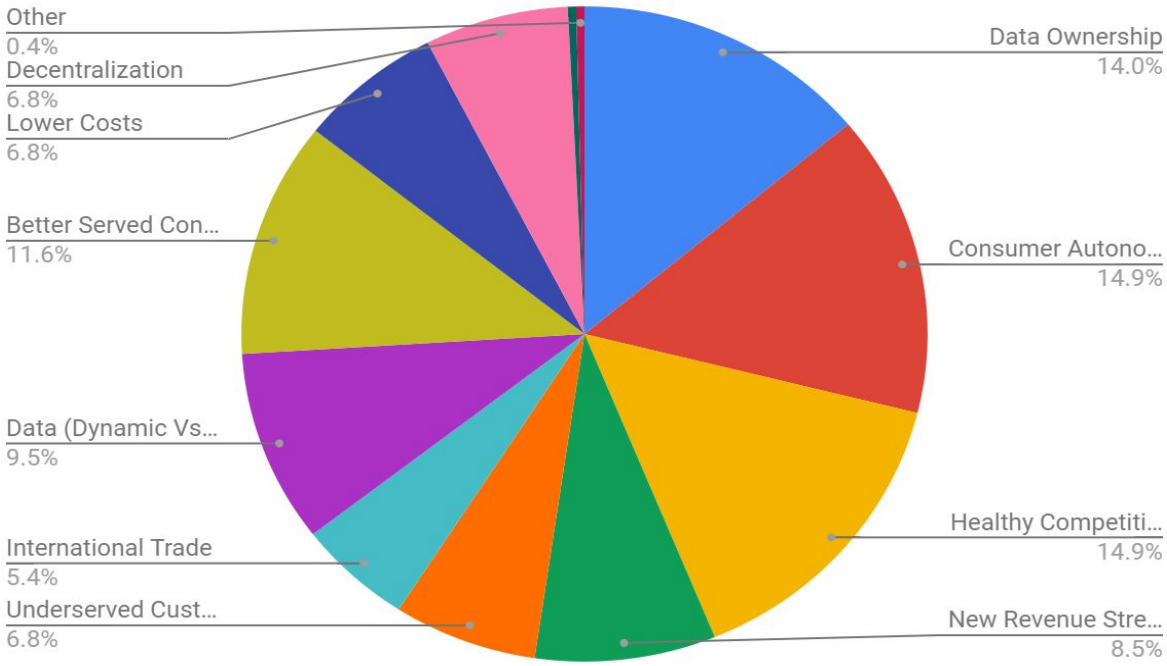

Figure 2. Survey results of respondents understanding of open banking benefits. 77% of survey respondents named consumer autonomy and healthy competition of the banking sector as the primary positive outcome.

Respondents also showcased their frustrations arising from lack of competition among banks in Canada and better services/products available South of the border. Discontent was particularly visible due to the high fees for banking services. The audience believed that open banking would change this dynamic and force incumbents to better serve clients (Figure 2).

Question 2

In order for Canadians to feel confident in an open banking system, how should risks related to consumer protection, privacy, cybersecurity, and financial stability be managed?

The questions of consumer protection, privacy, and cybersecurity have one common denominator in the form of data, which has 4 associated processes: capture, storage, transfer, and processing. We discuss issues presented in the above question from the perspective of those 4 processes:

Key problems that could result from open banking:

- *The amount of data captured and uploaded, pertaining to individual actions is likely to explode in the coming years, leading to issues of privacy and tracking.*
- *More and more data is being stored, both within and outside domestic boundaries, which presents multiple scenarios for data breaches.*
- *Improvements in data skills and processing powers allow innumerable opportunities for covert control and discrimination.*
- *The use of technology could lead to the creation of products that consumers don't understand, affecting financial stability not only on the individual but national level.*

Q2.1 Capture

Over the past few years, a massive amount of data has been generated. According to a report from IBM Marketing Cloud titled “10 Key Marketing Trends For 2017,”[18] 90% of the data in the world today has been created over the past two years, at the rate of 2.5 quintillion bytes of data a day.

In today’s world, we create data through numerous channels such as communication, internet, and social media. Google now processes 40,000 searches every second[19] (this is when only half of the World's population has access to the internet[20]). Every minute 456,000 tweets are generated on Twitter[21] and 156 million emails are sent[22]. More than 300 million photos get updated on Facebook everyday[23].

An important point to take into consideration: all this data is generated through both voluntary and involuntary actions. So even if there are rules and regulations that curtail data collection processes by tech giants such as Google or Facebook, humans will still be willingly uploading volumes of data in some form or the other.

[18] 10 Key Marketing Trends for 2017 and Ideas for Exceeding Customer Expectations, 2017, IBM Marketing Cloud
[19] Google Search Statistics, Internet Live Stats
[20] ITU: More Than Half World’s Population Using Internet, 2018, Voa News
[21] Data Never Sleeps 5.0, How Much Data Is Generated Every Minute? 2017, DOMO
[22] What happens in an internet minute in 2017?, 2017, World Economic Forum
[23] Here’s How Many Digital Photos Will Be Taken in 2017, 2017, Mylio

The IDC Data age 2025 report has some other interesting facts about the future of data[24]. For instance:

- In 2025, the IoT (internet of things) data analyzed and used to change business processes will be as much as all of the data created in 2020.
- By 2025, the amount of global datasphere that's subject to data analysis will grow by a factor of 50.
- By 2025, IDC predicts that the total amount of digital data created worldwide will rise to 163 zettabytes, primarily due to the growing number of devices and sensors.

Furthermore, IoT has the potential to capture all parts of a person's life, which can lead to serious privacy violations. As stated in the Future Trends Volume 8: The Future of Data, published by the Internet Advertising Bureau UK, we are likely to see close to 50 billion connected devices by 2020. The report further illustrates an example "Take the smart toothbrush that was launched at Mobile World Congress. For example, the smart toothbrush can collect data on how often, how long and how hard you brush your teeth for. It's valuable because that data could be directed to your dentist, so when you go for your regular your dentist can advise you accordingly in order to maintain your healthy teeth.".

With the growing number of different interaction methods, it could be that most consumers are completely unaware of the data being collected. Case in point: Google collects data on

[24] IDC FutureScape: Worldwide Analytics, Cognitive/AI, and Big Data 2017 Predictions, 2017, International Data Corporation (IDC)

individuals even in incognito mode[25] and Facebook creates shadow profiles for those who don't even have an account on the platform[26].

With open banking, there will likely be an explosion in the number of Canadian fintechs, that will constantly look for new sources of data to facilitate better decision making; in essence, data from an individual's personal life could be matched with their banking data leading to privacy breaches. And this will likely be a continuous phenomenon as there is a perennial source of new data points[27].

Q2.1.1 Recommendations

- *Regulators will need to be more proactive and pre-empt uses (and collection points) of data.*
- *Continue with the sandbox approach of testing new fintechs to ascertain privacy violations, instead of setting principles or rules-based regulations[28].*
- *Consumers should be aware of all data being collected, and disclosure frameworks should be created.*
- *Consumers should have a right to deletion and options to opt-out of data gathering processes.*

[25] Google Chrome's Private Incognito Mode Leaks More Data Than You Think, 2018, Independent

[26] Shadow profiles - Facebook knows about you, even if you're not on Facebook, 2018, The Conversation

[27] Four future scenarios: the personal data economy in 2035, 2017, Nesta

[28] Regulation Tomorrow: What Happens When Technology Is Faster than the Law? 2017, American University Business Law Review

Q2.2 Storage

More data captured means more data stored, increasing the probability of a breach, which can take two forms: unauthorized entry or unauthorized transfer.

According to Information Age, data breach reports are up 75 percent over the last two years. One of the reasons for this is emerging legislation and disclosure requirements, while others suggest that hackers are becoming increasingly sophisticated in their attacks. Moreover, at present, 1 in 7 cyber attacks with banks remain successful. And cybercriminals have started using sophisticated machine learning and artificial intelligence methods for cyber attacks[29].

In the case of open banking, these data breaches are likely to be exacerbated as sharing data outside will lead to more locations where the data is stored and processed, thus multiplying potential attack opportunities. A solution could be increased spending on cybersecurity, but much cannot be expected from bootstrapped startups that are looking to reduce spending as much as possible.

Another consequence of open banking could the that customers increasingly log into their accounts using credentials on third-party-provider (TPP) platforms. Banks will have limited access to information and interaction with clients - the backbone of current banking security protocols[30]. Other possible security breach scenarios in open banking include the exchange of compromised data from a TPP to the bank, e-certificate theft and the use of these certificates by fraudulent TPPs.

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[29] 91% of cybersecurity pros fear hackers will use AI to attack their company, 2017, Tech Republic
[30] Large-scale Cyber-attacks On The Financial System, 2018, Oliver Wyman

Q2.2.1 Recommendations

- *Regulatory authorities would have to enact new laws attached with stringent punitive measures that outweigh the possible benefits accrued through voluntary data breaches.*
- *Create laws requiring the full disclosure on data compromised in case of security breach.*
- *As a starting point, push towards the creation of security standards in compliance with ISO 27001.*
- *Authentication procedures that use the three elements – knowledge, possession inherence should be mandated for both TPPs and banks.*[31]
- *Reduce the possibility of data breaches because of human error through cybersecurity education and training for employees at all financial institutions and fintechs*[32]*.*

Q2.3 Transfer

As discussed in Section Q2.1, the number of IoT devices is likely to increase exponentially over the coming year. Points of communication will thus increase manifold, which in turn implies multiple “transfer points” that are vulnerable to security breaches[33].

What is more worrying, though, is that most businesses are not ready for this change. Gemalto, an enterprise focused on digital security, stated that only around half (48%) of businesses can detect if any of their IoT devices suffered a breach[34].

[31]PSD2 & Open Banking Security and Fraud Impacts on Banks, Are You Ready? 2016, Accenture

[32] According to Symantec’s 2018 Internet Security Threat Report (ISTR), an extraordinary 54.6% of emails are spam and many result in data breaches.

[33] IoT Vulnerabilities & Risk Mitigation, 2017, IoT For All

[34]Almost half of companies still can’t detect IoT device breaches, reveals Gemalto study, 2019, Gemalto

According to report published by the Journal of Alternative Investments, titled FinTech Is Merging with IoT and AI to Challenge Banks: How Entrenched Interests Can Prepare, “Collapsing prices of sensors, bandwidth, processing, and storage will allow upstarts to abandon the internal world of static data, which has driven finance for centuries. They would then create new sciences of risk, data management, credit analysis, insurance pooling, and trading that are based on ubiquitous and dynamic external sensor and smartphone data, which are measured in the billions. This is a world of data creating business—not the other way around. This is the world of the Internet of Things, and computers will increasingly make human-like decisions on all forms of risks."

These issues pertaining to IoT security are likely to surface for the financial services industry as well since the use of telematics and other devices is likely to grow through innovative ideas presented by fintechs[35].

IoT cybersecurity an issue and increasing use of IoT in fintech will be a major issue in case of open banking, as fintechs that are more innovative and experimental will combine a person's banking data with other datasets to create an enhanced user experience. Moreover, many will use IoT in their processes, which makes them vulnerable to attacks.

Moving away from IoT and transfer issues at the micro level, problems can be observed for data transfers among countries. In the article titled "Your legal pot buying data could get you banned from the U.S., lawyers warn" published in the Global News (April 2018), an argument is made where someone who has legally purchased cannabis in Canada can be considered as a

[35] FinTech Is Merging with IoT and AI to Challenge Banks: How Entrenched Interests Can Prepare, 2018, Paul Schulte and Gavin Liu, The Journal of Alternative Investments

cannabis abuser by an American official, if they see certain purchase patterns in data stored on Visa or Mastercard servers in the United States. This problem could be further exacerbated with cloud computing, where Canadian regulators have already enacted laws[36].

Anonymization cannot be considered as a solution here. Paul Ohm, in his paper Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization, demonstrates how data scientists can “re-identify” or “deanonymize” individuals hidden in anonymized data with astonishing ease.

And in the East, China has been quick to realize this problem and recently issued strict data localization standards through the Cybersecurity Law laid in Article 37 for Critical Information Infrastructure (CII)[37].

Q2.3.1 Recommendations

- *Enact localization laws for data storage to protect citizens against prosecution in other countries.*
- *International fintech firms and tech giants that are already running operations in Canada should be required to disclose data that is being stored on external servers.*
- *IoT will be the weakest link for open banking cybersecurity. Strict guidelines should be placed in terms of authorized hardware[38].*

[36] When Your Data Must Stay in Canada, 2017, Server Cloud Canada
[37] China: China To Implement Widespread Data Localization For Personal Information And Important Data, 2018, Mondaq.com
[38] Hardware Is the Foundation of IoT Security, 2016, GlobalSign

Q2.4 Processing

Q2.4.1 Unknown/Improper Use

The possible misuse of data and unapproved disclosure of information gained notoriety in 2012 [39], when the retailer Target used a girl's purchase history to determine that she was pregnant. Following that, the retailer sent the girl catalogs featuring pregnancy items which were discovered by the family. At that point, the parents were unaware of the fact that their daughter was pregnant, implying that Target effectively disclosed confidential health insurance to third parties.

While this case is not directly related to fintech, it can be argued that they could do something similar and more, as access to all transaction and payments data can lead to even better knowledge of an individual, and thus an extraordinary ability to influence decisions.

Q2.4.2 Discrimination

A paper titled "On the Rise of the FinTechs - Credit Scoring using Digital Footprints," issued by the Federal Deposit Insurance Corporation in September 2018, establishes the case of how a simple digital footprint can be used the assess creditworthiness of an individual and create a profile that could exceed or be at least equal to the content of credit bureau scores.

The paper goes further and states that fintechs, that are much more superior and agile when it comes to processing data (and digital footprints), can create new business models used for

[39] How Target Knew a High School Girl Was Pregnant Before Her Parents Did, 2012, Time Magazine

credit scoring. In the algorithm tested by the author of the paper, the simple act of owning an Apple phone as compared to Android puts you in the upper quartile of creditworthiness. That data point is combined with 9 more data points to provide an AUC score[40] that is equivalent or superior to many traditional credit scoring systems used by financial institutions.

Providing a higher credit score to an individual that owns an iPhone might be a borderline violation of anti-discriminatory laws, but the use of a person's skin color or their association will definitely be one[41]. In an infamous case, Amazon had to scrap an artificial intelligence recruitment tool because it was not gender-neutral[42]. With open banking, fintechs are likely to use similar algorithms on datasets obtained from banks, creating the possibility of bias and discrimination in the financial services industry.

Q2.4.3 Control

By the year 2020, Chinese authorities aim to set up a process that ranks citizens based on "social credit." Akin to a credit score, an individual's social score can go up or down depending on their behavior. Punitive actions would include bans on flying and public transportation, throttling internet speeds, banning their kids from school, restrictions on certain prestigious jobs and even taking the owner's dog away.

Although, something similar may face severe public disapproval in other countries. Insurance companies can use similar punitive action schemes to control individual behaviors. Apps and telematics devices that instruct individuals on their driving already exist.

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[40] Gini, ROC, AUC (and Accuracy), 2014, Staesthetic

[41] Consumer-Lending Discrimination in the Era of FinTech, 2018, Robert Bartlett, Adair Morse, Richard Stanton, Nancy Wallace, Haas School of Business UC Berkeley

[42] Why Does Artificial Intelligence Discriminate?, 2018, Jeannie Marie Paterson and Dr Yvette Maker, University of Melbourne

A subtler case of control can be seen through recommendation engines, where machine learning is used to assess a person's preferences. These preferences are then used to make product recommendations, reinforcing previous behavior and limiting our right to choose.

Q2.4.4 Recommendations

At present, fintechs and bigtechs are not subject to any regulatory standards as financial institutions that are subject to Basel Accords, among other stringent regulatory regimes. If fintechs are to deal with financial matters of individuals and institutions, enacting a set of rules for these establishments might be necessary.

Q2.5 Financial Stability

Q2.5.1 Systemic Risk

Non-bank and marketplace lenders (MPLs) have gained considerable market share over the past few years. In 2016, they were responsible for half of US residential home loan originations [43]. Numbers are growing in the small business lending space in Canada. For instance, Lending Loop has advanced close to C$39 MN in loans till date[44].

MPLs and non-bank lenders have certain fundamental flaws. Primarily, they are susceptible to shocks in the form of interest rate jumps, rise in defaults and withdrawal of credit they receive from traditional commercial banks[45].

[43] Non-bank US mortgage lenders pose systemic risk,2018, Financial Times
[44] Our Loan Statistics, Lending Loop
[45] Non-bank US mortgage lenders pose systemic risk,2018, Financial Times

Moreover, the lifeblood of a marketplace lender is funding, which over the past few years has been easy due to unusually good credit performance in the post-recession economy and repeated Federal Reserve interventions to keep interest rates low, attracting investors looking for high returns to their platform[46].

But a slight change in market conditions that offer better investment alternatives will plug the healthy flow of investments that these lenders enjoy at the moment, as was observed in the case of China[47]. In such a situation, small businesses and individuals who were heavily dependent on alternative lenders to refinance their traditional debt would be left empty-handed leading to a multiplier effect throughout the economy and eventual collapse of the entire financial system. Furthermore, many of these alternative scoring models that form the base of alternative lending startups are yet to mature and contain many unknown risk parameters[48].

All this is relevant in the case of open banking as it would open doors for alternative lenders. As was the case with a startup in the UK, called Swoop, that was able to offer the best financing options after accessing financial data on the business, data obtained through a bank[49].

Q2.5.2 Large Scale Cyber Attacks

Cyber attacks, whether large or small, can cause stakeholders to lose confidence in the system and disrupt everyday operations. According to a report published by Oliver Wyman, “Payments, clearing, and settlement services are critical to the financial services industry and essential for the smooth functioning of the global financial system and the economy overall. Wholesale

[46] Marketplace Lenders Are a Systemic Risk, 2015, American Banker
[47] China’s P2P lending crisis worsens as second firm runs into trouble in a week, 2019, South China Morning Post
[48] FinTech cos like Capital Float, LoanTap are using bots to decide if you’re eligible for a loa, 2016, Economic Times
[49] B2B PAYMENTS How Open Banking Opens Doors For Alternative SMB Lenders, 2018, Pymnts.com

payments services enable financial institutions and corporations to send payments domestically and across borders. Securities clearing and settlement services include central custody of securities and facilitate the exchange of securities on behalf of buyers and sellers. Disruption of these services can significantly impact the functioning of financial markets by, among other things, impeding credit and liquidity flows"[50].

The same report goes on to argue that in an increasingly interconnected ecosystem, even an isolated case of breach can lead to contagion and ripple effects which can bring the entire system to a standstill.

Q2.5.2 Recommendations

- *Stress testing new algorithms, products and services that introduce systemic risk should become a priority.*
- *Recovery and response mechanisms need to be considered and put into place, based on new threats that open banking could introduce. The primary objective should be the continuation of services in case of an attack.*

Survey Results

From the survey results and in-class discussion, it was evident that data breach is the major concern when it comes to open-banking. But the audience agreed that the fear of data breach should not stop the Government of Canada to proceed with the implementation of open banking. Respondents were equally concerned about the use of data for exploitation and

[50] Large-scale Cyber-attacks On The Financial System, 2018, Oliver Wyman

making product recommendations. This could again be tied to the intrinsic need of being in control rather than being controlled. (Figure 3).

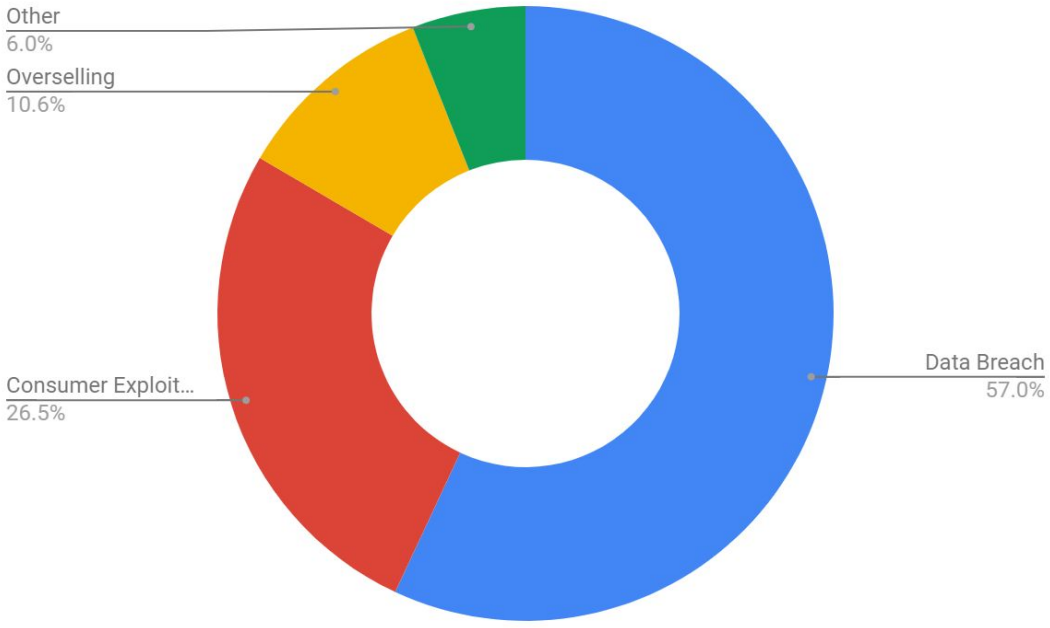

Figure 3. Survey results showing respondents biggest fear when it comes to the subject of open banking. 57% of respondents believe that data breach is the main concern followed by 26.5% thinking that consumer exploitation is a primary concern.

Question 3

If you are of the view that Canada should move forward with implementing an open banking system, what role and steps are appropriate for the federal government to take in the implementation of open banking?

Most countries are currently in the phase of "open-banking experimentation" and are using an iterative approach to devise the best path towards an effective open data environment. We believe that the federal government needs to step in and take certain actions.

Key actions that the federal government should take

- *Initiate a move towards open banking, with the long-term goal of creating a co-regulation system.*
- *Facilitate the process of standards setting and accept that it is an iterative process involving multiple stakeholders and discussions, that could extend over the years.*
- *Identify an open-banking beachhead, so that there is swift acceptance of the new system among a targeted group of consumers.*
- *Encourage regulators to build technical capabilities which will allow them to stay ahead of the game in the technologically-driven banking sector of the future.*

Q3.1 Works Towards Co-Regulation

An article published in The Financial Post in 2016 stated how regulations in Canada are stifling innovations. As stated before, the banking industry in Canada is highly regulated which leads to a robust financial system but also creates an oligopolistic market.

We would, thus, consider a move towards open banking as an act of deregulation rather than regulation, akin to what was done in the energy sector in the United Kingdom. In fact, the primary tenets behind PSD2 related to an increase in competition which would eventually drive down prices and improve customer experience[51].

It is for these reasons, we suggest that the Canadian Government treat this case as that of Microsoft (antitrust) during the 90s. During that period Microsoft had a strong hold over the market leading to a monopoly, warranting government actions to loosen this stronghold and facilitate the growth of smaller players[52].

This would involve mandating banks to open up data warehouses to external TPPs. We, however, suggest that this is done through initial consultations with banks, as the cost of setting an open data infrastructure is quite significant. Estimates exist for Australian banks that peg the initial cost to be around A$ 200 MN for each bank[53].

McKinsey, however, argues that the creation of APIs will eventually benefit banks. They will soon realize that this is a business model that can feed the bottom line, contingent on proper

[51] PSD2 – a game changing regulation: What challenges and opportunities could the new directive provide? 2018, Price Waterhouse Cooper

[52] How The Antitrust Battles Of The ‘90s Set The Stage For Today’s Tech Giants, 2018, The Verge

[53] Westpac predicts Open Banking to cost AU$200m to implement, 2018, ZD Net

implementation and approach[54]. According to McKinsey, ". as much as $1 trillion in total economic profit globally could be up for grabs through the redistribution of revenues across sectors within ecosystems. That makes APIs, which play a crucial role in linking organizations and technologies in ecosystems, a significant competitive battleground capability[55]."

In this scenario, a case of co-regulation or self-regulation can be made. According to the white paper issued by UK Government, Department of Trade and Industry and Department of Culture, Media and Sport, titled Communications White Paper, self-regulation means "to indicate situations in which the regulator would be actively involved in securing that an acceptable and effective solution is achieved. The regulator may for example set objectives which are to be achieved, or provide support for the sanctions available, while still leaving space for self-regulatory initiatives by industry, taking due account of the interests and views of other stakeholders, to meet the objectives in the most efficient way. The regulator will in any such case have scope to impose more formal regulation if the response of industry is ineffective or not forthcoming in a sufficiently timely manner." The White Paper, which formed the basis for the reform of UK's communications regulation through the adoption of the Communications Act in 2003, further explains "distinguished co-regulation from self-regulation on the basis that the former had an active involvement by the regulator to ensure that an acceptable and effective solution was achieved, for example through setting objectives or providing support for sanctions whilst leaving space for self-regulatory initiatives by industry."

Many industries including health care, higher education, fashion, advertising, mining, marine fishing, professional sports, and nuclear power have used self-regulatory processes to govern

[54] What it really takes to capture the value of APIs, 2017, McKinsey
[55] What it really takes to capture the value of APIs, 2017, McKinsey

industry practices[56]. This is akin to the approach followed by the Royal Bank of Australia for regulating its payments system[57].

On a more granular level, it can be argued that self-regulation provides the right balance between strict government regulation and a laissez-faire system[58]. In more specific terms, it creates a situation where consumers are protected sooner, leads to a reduction in information asymmetry (thus, higher consumer confidence), low compliance costs and internalization of ethical behavior among businesses

This, however, might be too idealistic, given that SEPA (Single Euro Payments Area) did not get off the ground through a self-regulated regime[59]. According to BBVA research[60], "A mix of self-regulation and legislation (co-regulation model) seems more balanced than pure self-regulatory alternatives. Co-regulation provides a general regulatory framework while still maintaining some of the benefits of self-regulation. The idea is that self-regulation and codes of conduct do not always have the desired effect if they are not accompanied by legislation. This is the balance that the GDPR is trying to strike: it promotes the use of codes of conduct while setting down regulatory rules."

[56] "Industry Self-Regulation: An Institutional Perspective, 1997, Neil Gunningham and Joseph Rees, Law & Policy

[57] Approach to Regulation, Reserve Bank of Australia

[58] Benefits and Limitations of Industry Self-Regulation for Online Behavioral Advertising, 2011, The Information Technology and Innovation Foundation

[59] Varieties of European Economic Law and Regulation, Kai Purnhagen, Peter Rott, Page 270

[60] Self-regulation in data protection, 2018. BBVA Research

Q3.2 Facilitate Standards Setting

The federal government will have to take actions that encourage stakeholders to think about and take steps towards setting API standards. As a starting point, the example of Singapore can be followed, where there are no compulsory requirements in terms of API, but the government partakes in initiatives related to an open data framework. For instance, it has a finance-as-a-service API playbook, published by Monetary Authority of Singapore (MAS) and the Association of Banks in Singapore, that is non-binding but provide guidance to banks, fintechs and other TPPs towards the development of API-based system architecture.

The process of standards setting would require input from various stakeholders. Ann Senn, in her book Open Systems for Better Business, argues that there are three key groups of players in industry-wide standard setting: standard creators, standards adopters/integrators and standards influencers.

Creators consist of open organizations which define and approve standards through negotiations and agreements. The process could take anything from a month to years, depending on the relative strength of different stakeholders. Standard adopters comprise technology manufacturers and suppliers, who have the primary responsibility of integrating standards across different architectural layers and ensure that systems do not conflict. Influencers are technology manufacturers, suppliers or users who have a stake in standards development.

The development of standards would involve multiple talks and negotiations among these stakeholders. Canada has an advantage in this area, as the number of banks is a handful,

leading to faster agreements and decisions. One of the primary reasons why we were able to implement a digital payments systems (Interac) faster the the US[61].

It is the Canadian government that needs to facilitate these talks, conversations, and negotiations across. As Ann Senn explains “standard setting cannot be viewed as a simple process of finding "the one best way," but as a political process where different needs are negotiated. In fact, the process often leads to the development of one of three types of standards: those that are minimal and embody only the areas of easy agreement; compromise standards which arise from competing interests but which are viewed as useful across all implementations; and maximal standards, which build upon existing products to develop a new standard that exceeds the capabilities of all existing methods. “

Practically speaking, the federal government will need to take steps towards assignment of ownership and responsibilities, mobilization of identified stakeholders, detailing of each initiative, scope and ownership model, development of a structured implementation plan, and phased implementation plan.

Moreover, it would have to realize that since almost all stakeholders are in a stage of “open banking experimentation,” what is considered appropriate and sufficient in the realm of standards today, may not be the case tomorrow. Identifying and categorizing standards, as present standards, interim standards and strategic directions, is one possible solution to this challenge. For standards where there is no consensus or those that are considered too risky can be put the “under-consideration” bucket, until the point of sufficient information to make decisions that benefit the consumer.

[61] How Canadian banks dominated peer-to-peer payments, 2018, Tearsheet

It is also noteworthy that not all APIs are built equal. They all have different functionalities and associated levels of risk and data. Hong Kong understands this and is employing a phased API implementation roadmap, that would allow it to test and learn in a controlled and calculated manner at each step[62]. Another important consideration towards the development of API standards is their adaptability to already implemented industry standards; which at present consists of PSD2 and initiatives in the UK.

Australia, for instance, will use UK's Open Banking Technical Specifications as the starting point for devising its own standard[63]. If countries around the world were to follow a similar path, it could lead to the creation of international standards, allowing fintechs to provide their products and services overseas. But it will also increase contagion risk and make domestic industries more vulnerable to international competition.

Q3.3 Identify the Beachhead

In his book, Disciplined Entrepreneurship: 24 Steps to a Successful Startup, Bill Aulet refers to the concept of "finding the primary beachhead market," which refers to the the easiest market from where you can start selling a product, as that is where the early adopters (or those with a strong pain point) are found.

This concept in the case of open banking can be metamorphosed into identifying a market where consumers would be willing to quickly adapt initiatives related to open banking. Even

[62] Open Application Programming Interface (API) for the Banking Sector, 2018, Hong Kong Monetary Authority
[63] Open Banking Regimes Across the Globe, 2018, Gilbert and Tobin

though the process of identifying the beachhead market is iterative, educated guesses can be made using similar cases and other applicable data.

For an appropriate parallel market, the energy sector of the UK fits the bill. In the early 1990s, UK residents had no option but to buy electricity from the local supplier, who were few and functioned as an oligopoly. To tackle this problem and lack of competition, the UK Government decided to deregulate the market. The pertinent point for our analysis is that early-adopters of new regulations was not the general consumer, but small businesses who were looking for options to cut costs[64].

Accenture recently conducted a study with large corporations and SMEs to understand their views on open banking. They surveyed 600+ respondents across 11 countries (including Canada) and learned that 69% of large corporation and 60% of SMEs would prefer for their bank to provide an open banking system. Furthermore, their biggest pain points exist in payments, finance, and cash management, and only 39% of SME respondents were happy with their software for payments and banking.

A big pain also exists in the payments industry in general, where merchants are subject to various fees depending on the type of service that they use, such as bank fees, rail fees , and card fees. On top of that, they usually have to pay a monthly subscription and registration fees for the PoS machines. Open banking could lead to systems where the merchants settle directly with consumer accounts, eliminating all the middlemen and associated fees[65].

[64] One year of Open Banking: lessons from ‘re-regulation’ in telecoms and energy, 2018, The Global Treasurer
[65] Does Open Banking mean the end of card payments? 2018, Finextra

Q3.4 Build Technical Capabilities

A number of digital tools are available for regulators to employ an out-of-the-box approach in ensuring compliance[66] With fintech, governments and regulators will have to develop the technological capabilities to deal with numerous products that are created due to` open banking.

As a starting point, governments will have to facilitate continuous dialogues on how fintechs are using data. As Kevin Werbach, Professor of Legal Studies & Business Ethics at Wharton University, describes it, “They (tech firms)[67] use the data internally to be more efficient and to provide better service, but if they could provide more transparency of that data, that would give regulators the opportunity to identify what the market performance is. This can be done in a secure way, in a way that doesn’t harm them with competitors and so forth.”

Werbach further goes on to explain that regulations will have to be more algorithmic i.e. in the future where decisions related to prices and insurance premiums will be determined by algorithms on an ongoing basis, regulatory authorities will have no option but to develop capabilities to understand these algorithms. The federal government should facilitate talks among all regulatory authorities to create such capabilities.

[66] The Regulator's New Toolkit, 2018, Deloitte
[67] Information within parentheses added

Q3.5 Survey Results

- Respondents believe that open banking will only be possible with proactiveness of government and regulators. They want the federal government to set regulations and ask financial institutes to comply by a certain deadline and create standards for fintechs.
- There is an implied sense of urgency. Respondents want to see open banking as fast as possible so that they can enjoy the same benefits as those enjoyed by banking customers in other technologically advanced countries.
- Respondents think that for implementation of open banking the federal government should look for ways to collaborate with the fintech ecosystem. This open call for consultation papers is a great starting point.
- Education is an important aspect when it comes to managing personal data. Even outside of open banking, there is an increasing need for the government to educate Canadian citizens on how to manage and protect their data.