Exploring the FinTech Spectrum

Richard-Marc Lacasse PhD, Berthe Lambert PhD

FinTechLab, Université du Québec à Rimouski Campus de Lévis, Canada
e-mail: Richard-marc_lacasse@uqar.ca

Abstract

The advent of the Internet of Things (IoT) and Artificial Intelligence (AI) has brought on an economic tsunami in financial services. This paper explores creative disruption and the widespread presence of new online platforms within the financial community. It sheds light on the evolution of financial services and expounds on the development of new financial technologies, with special attention paid to the various business models: FinTech Mindset, Insurtech, Peer-to-Peer Lending and Crowdfunding. It also briefly explores the challenges faced by financial regulators, and outlines an ambitious research agenda in the conclusion .

Keywords: FinTech, Creative disruption, Digital platform, Business models

Purpose Statement, Terms and Research Methodology

The research paper's first challenge is to encapsulate key elements of the FinTech ecosystem despite the complexity of the sector. A focal point of the paper is therefore to demystify the FinTech disruptive innovation arena. Qualitative data provides conceptual representations of new business models in financial services. The models are original and based on a series of events and case studies. Ultimately, the manuscript sheds new light on FinTech and proposes an ambitious research agenda.

But what exactly is "FinTech"? The Oxford Dictionary defines it as "*Computer programs and other technology used to support or enable banking and financial services*". The UQAR *FinTechLab* defines it as follows: *A field or sector arising from the symbiosis of digital platforms and artificial intelligence in financial services, generally at odds with traditional financial services* (Lacasse et al, 2016). According to *The Economist* magazine, North Americans are investing billions of dollars in FinTech startups: "*Investors have poured billions of dollars into* *"fintech" startup* *shake up lending, payments, broking* ("*A data tsu* *among other finan* Odds", 2016).

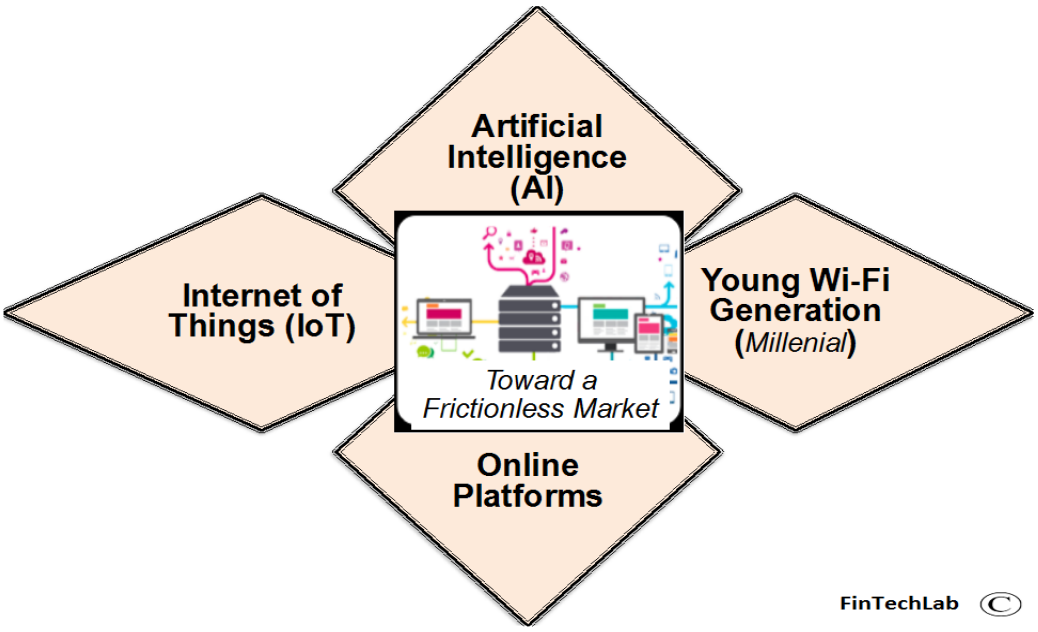
With academic knowledge of FinTech still relatively limited, we concur with Henry Mintzberg of McGill University, who stated: "*It seems far more important to research important topics with soft methodologies than marginal topics with elegant methodologies. (…) Most of the real insight has come from studies that used soft methodologies.*" (Mintzberg, 1979). A qualitative approach was selected because of the constraints of FinTech's exponential growth, which means that the 2015 database is already obsolete. Although the UQAR's *FinTechLab* investigated the phenomenon in the United States and Belgium, fieldwork and action-research was done in Canada. Data sources ranged from classical ethnography to state and governmental studies, documentary evidence, local case studies, participant observation, semi-structured interviews and action-research with a crowdfunding platform. Data from research reports by the Big Four accounting firms (PwC, Deloitte, EY

and KPMG) were also very useful; these international professional firms offer audit, insurance, tax, advisory, actuarial, corporate finance, and legal service.

The Advent of Interactive Intelligent Digital Platforms

At first, artificial intelligence (AI) machines were programmed to calculate and perform specific tasks, but we now use Machine Learning (a set of algorithms that attempt to model high-level abstractions in data). A new "digital ecosystem" has reinvented the rules.

Figure 1. North-American FinTech Ecosystem



The advent of the Internet of Things (IoT) has brought about an economic tsunami: "*Innovations in IoT, which has its roots at MIT, are driving remarkable new technologies and enhancing existing platforms in almost every major industry.*" (Conner-Simons, 2016). Geographical limitations no longer matter; information is relayed in real time; the new wi-fi generation (millennials) has changed transaction patterns. Business models in every field of activity need to be updated and redesigned. For instance, faxing has been supplanted by emailing; the music industry has become subject to the rules of *iTunes*; *Netflix* has completely superseded the once-mighty *Blockbuster*; *Kodak* has given way to *iPhoto*; small book stores struggle in their war against *Amazon*; and so on.

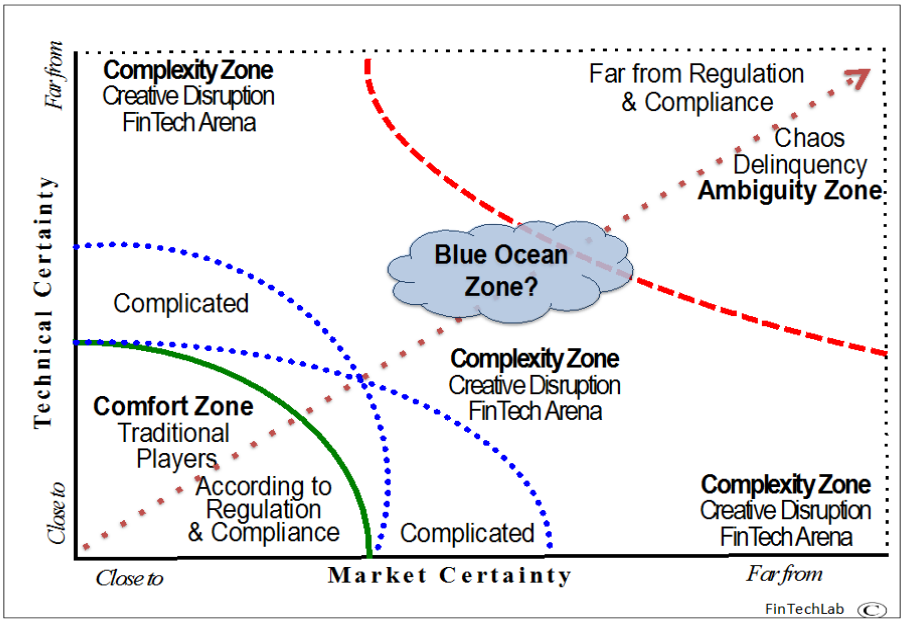
In the world of FinTech, AI is starting to have a major impact on investing and how managers and consultants behave. In some cases, IA itself plays the role of consultant, interacting directly with the user, with no human interface. According to the BBC News, a computer algorithm has been appointed to the board of directors of Deep Knowledge Ventures, a company in Hong Kong; the robot is entitled to vote, and supplies a wealth of statistics on subjects discussed by the board. In January 2016, Microsoft, Google and Facebook open-sourced their deep learning tools, claiming it would enable artificial intelligence to grow much faster. Many private banks are already using IBM's Watson IA to predict the stock market. On the other side, big names like Stephen Hawking, Elon Musk, and

Bill Gates joined hundreds of others to warn against artificial intelligence, penning an open letter claiming that "*artificial intelligence can potentially be more dangerous than nuclear weapons*" (Sainato, 2015).

Exploring the disruptive innovation arena

Disruptive innovation, a term coined by Clayton Christensen, is innovation that creates value and eventually disrupts an existing market, displacing the established market leaders. Exploratory modelling of disruptive innovation can be useful for analysing the new financial services arena. Concepts drawn from complexity theories also offer new ways to observe a phenomenon. The model shown in Figure 2 plots issues according to the level of certainty among stakeholders concerning solutions to a problem versus certainty that a given intervention will have the desired result. The vertical axis indicates movement from technological solutions close to certainty toward solutions far from certainty, while the horizontal axis indicates movement from stable markets to uncertain markets. The diagonal axis indicates movement from "respect of regulation and compliance" to delinquency. If there is a high level of certainty in the technological solutions and in the market, the problems are simple, i.e., a right answer exists and the traditional players stay in the comfort zone.

Figure 2. Spectrum of Creative Disruption in Financial Services



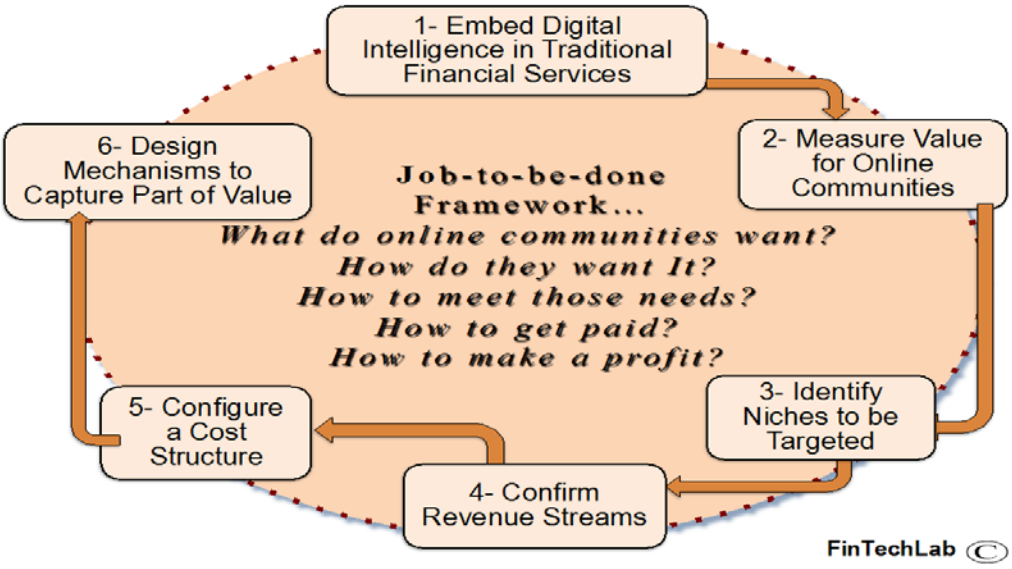
Moving away from certainty and compliance, issues become complicated, complex, and even chaotic. Traditional financial institutions prefer to operate within the comfort zone, according to regulation and compliance; the new generation of digital entrepreneurs, on the other hand, are excited and attracted by the "complexity zone" and the "Blue Ocean Zone". Moving into the "ambiguity zone" can be hazardous and costly: failure to disclose a conflict of interest in an investment fund led to the departure of French entrepreneur Renaud Laplanche, the founder and Chief Executive Officer of the famous unicorn, LendingClub (unicorn: any tech startup company that reaches a $1 billion dollar market value as determined by private or public investment). The online-lending venture has lost $2 billion in value since the Securities and Exchange Commission (SEC) probe on Laplanche. In conditions "very far from certainty" (chaos, anarchy, far from regulation), standard tools and

techniques cannot be used. Some of the more complex aspects of a situation cannot be known ahead of time. Generally speaking, the FinTech ecosystem prefers a mix of complicated and complex situations with a blue ocean strategy.

Cracking the Code of a FinTech Business Model

A business model describes the means by which an organization creates, delivers, and captures value—whether such value is economic, social, cultural, or of any other form. When a FinTech venture capitalist receives money, he has an obligation to create value. Whatever the model, FinTech entrepreneurs use intelligent online platforms in creative ways as they attempt to craft solutions that are more cost-effective than traditional financial services. They often draw on original activities to generate a better return on investment. FinTech entrepreneurs are inventive regarding cost structures, revenues, and capital requirements. Inspired by Teece (2010), the FinTech Mindset Model shown in Figure 3 consists of interlocking elements that create and deliver value for stakeholders. FinTech ventures must create a better customer value proposition than traditional financial services. The profitable formula is the blueprint that defines how a FinTech venture creates value for itself while providing value to customers. It consists of the following formula: revenues often come from very small fees originating from a large online community. The cost structure is predominantly driven by efficient online platforms and good marketing strategies. It is important to identify the key resources, which are the assets such as technology, “whiz kids”, facilities, venture funds, networks and brands required to deliver the value proposition to the targeted customers. The aim is to effectively interlock the key resources: charismatic leaders, major business sponsors, media, and expertise. Successful FinTech ventures design complex operational and managerial processes that allow them to deliver value in such a way as to successfully repeat their activities and increase their revenue every month.

Figure 3. Mindset of FinTech Startups



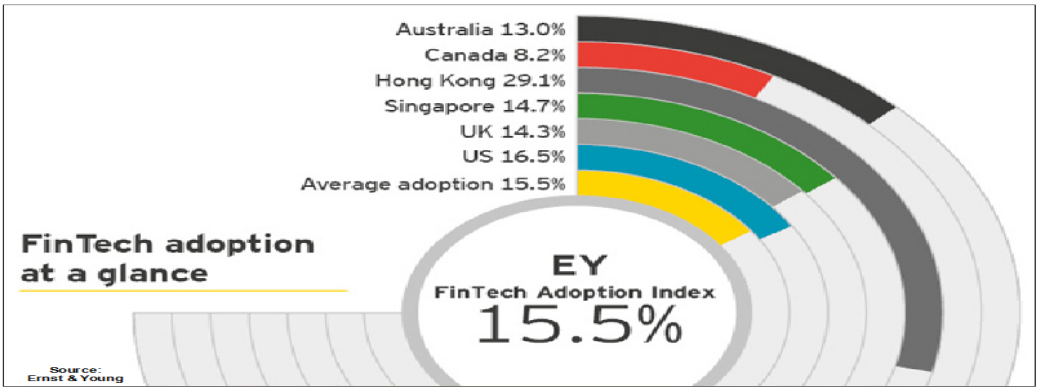
Entrepreneurs can be very creative when it comes to seducing customers, especially via online and viral marketing. Some multinational FinTech enterprises also have a complex legal structure and an opaque accounting system, making it impossible to accurately measure the

efficiency of their activities. LendingClub and Prosper are typical successful business models: the two largest peer-to-peer lending platforms in America have a market value of US $2 billion each.

The Current State of FinTech

According to the World Economic Forum, thousands of new entrepreneurs are disrupting the traditional financial services sector ("The Future", 2015). The 2016 *EY FinTech Adoption Index* shows that 15.5% of digitally active consumers used at least two FinTech products in 2015 (see Figure 4). EY (one of the Big Four) studied the world's most advanced FinTech countries (the Eurozone appears to lag far behind). Hong Kong has the highest rate of FinTech use of all the markets surveyed (29.1%). The United States has the second-highest adoption rate (16.5%), followed by Singapore (14.7%), the UK (14.3%), Australia (13%) and Canada (8.2%). Adoption rates could double within the year, however, as awareness of available products and services increases. EY states that "*FinTechs are moving in on the traditional financial services landscape and their products and services are catching on. For traditional services companies, including banks, insurers and wealth and asset management companies, the risk of disruption is real*." ("EY Fintech", 2015).

Figure 4. EY FinTech Adoption Index



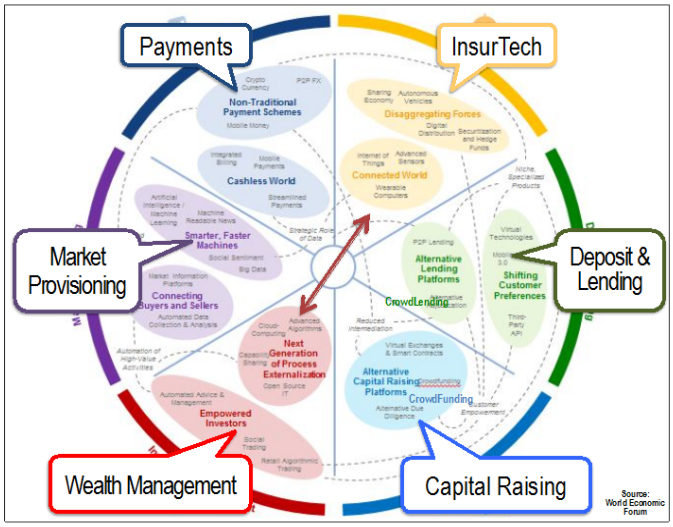
Thousands of startups are disrupting traditional financial services. There are over 40 new FinTech start-ups with valuations of over $1 billion (unicorns) (Bruene, 2015); as a measure, the value of the Laurentian Bank of Canada, a traditional bank founded in 1846, is only $1.2 billion. Digital payment platforms are moulding an increasingly cashless payment landscape, with decentralized and non-traditional payment schemes. Digital deposits and lending suggest alternative models of lending, thereby changing the market dynamics of traditional lenders.

In the coming years, online capital raising will transform the role of traditional intermediaries; the empowerment of clients through intelligent systems will also transform the role of traditional investment advisors. Intelligent digital tools will disrupt capital markets and bring about a world where buyers and sellers will be better connected than ever before. IoT and telematics are also reinventing the value chain of the ever-more-connected insurance industry. Traditional financial transactions are on the decline. Human involvement will become obsolete in the very near future, and financial institutions need to adapt their computer systems and distribution channels accordingly. Insurance and financial services are now clashing with a heavily regulated industry that is less and less able to compete with the

low operating costs of virtual insurance agents. Some companies have already automated the process of providing advice to customers: asset allocation, management services and tax optimization are all provided online. This democratizes access to financial advice, traditionally a privilege of the wealthy. These companies have met with very good success, currently doubling their sales every six months. In response, traditional wealth management funds have adopted similar tactics through robo-advisors.

A 2015 World Economic Forum's research report on the future of financial services establishes a taxonomy of disruptive innovation in financial services. The research team structured an original framework of six financial services functions and eleven disruptive innovation clusters. The six core functions, described in Figure 5, are: payments, market provisioning, wealth management, insurtech, deposit and lending, and capital raising. Embedded in the functions, eleven disruptive innovation clusters exert pressure on traditional business models (The Future, 2015).

Figure 5. Taxonomy and Convergence of FinTech Clusters



Eventually, FinTech will completely transform the financial services sector of every country. In every case, the advent of digital technology benefits the customer: new services meet or exceed expectations, and often provide a better product than traditional financial services.

Some Models: InsurTech, Crowdfunding and Peer-to-Peer Lending

Insurtech Models

Artificial Intelligence (AI) and the Internet of Things (IoT) are creating a new generation of interconnected solutions and services, and thus a new insurance ecosystem. Smart, connected products bring an entirely new infrastructure to the insurance industry. Digital convergence favours new product hardware, embedded software, connectivity, data running on remote servers, and security tools integrated into insurance of property and persons (Figure 6). InsurTech, is emerging as a game-changing opportunity to improve the relevance of insurance offerings. Hundreds of startups are transforming the industry by connecting real time data on clients. Manulife, Vitality Group and Fitbit introduced an online version of their life insurance program rewarding people for healthy living: clients can easily

log their activities using the internet and intelligent fitness wristbands. For instance, Baidu, a Chinese research engine, is beginning to apply artificial intelligence to insurance and loan underwriting to better assess risk. "*In insurance and consumer loans, AI and machine learning can help you identify all the patterns to help you reduce risk.*" (Kahn 2016).

Figure 6. InsurTech Models: Risk Management via Smart Interconnected Data

(Source: efinancialnews.com)

Crowdfunding

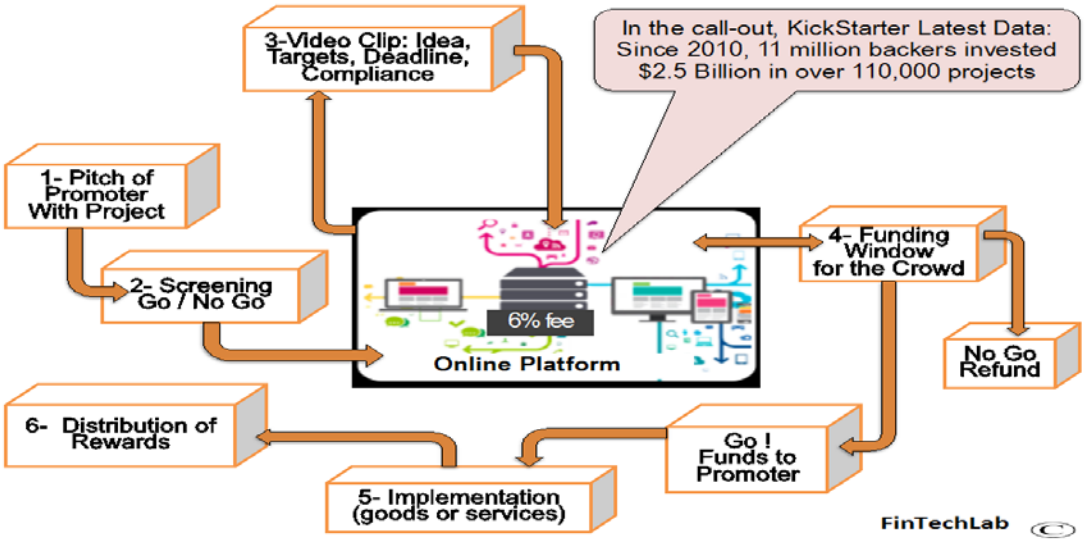
In 2003, Brian Camelio, a musician, launched a platform to support music ventures while giving rewards in return, and the first crowdfunding platform was born. Its success has inspired thousands of similar websites around the world. Crowdfunding, however, is not entirely safe from potential abuse: according to the FBI, after the tragedy of Hurricane Katrina in 2005, more than 2,400 malevolent web platforms stole millions of dollars from donors (Stern, 2013). Ezubao, a Chinese peer-to-peer (P2P) platform, stole more than $7.6 billion from 900 investors (Gough, 2016). On the bright side, the *Kickstarter* online platform, based in New York, has taken crowdfunding to unprecedented heights: since its creation in 2009, it has collected more than $2.5 billion in pledges from 11 million backers to fund 110,000 creative projects and start-ups in such diversified areas as technology, sports, films, music, and the arts (Figure 7). Lending-based models are still the biggest players in the field, with US $64 billion raised in 2015 (Wills and Jablonska, 2015). Most of the platforms are stationed in North America, but the United Kingdom is jumping on the bandwagon: according to an assessment from a consortium of researchers at the University of Cambridge and the University of Berkeley who studied the phenomenon, promoters in the UK raised US $8 billion in 2015 via crowdfunding. The main crowdfunding business models are Pre-Sales, Rewards, Donations, Equity and Peer-to-Peer Lending.

Pre-Sales – In a Pre-Sales crowdfunding campaign, a new product or service is placed online, and funders are asked whether they are interested in ordering it and paying for it in advance. This process replaces traditional market research, as well as validating demand and providing working capital.

Rewards – A Rewards-based model is best for social entrepreneurs who wish to collect donations for a small venture or social project by giving non-financial rewards in return, generally of a symbolic value.

Donations – Non-profit organizations use this model. Funds are collected for altruistic or spiritual causes. Donors are loyal, and promoters will often keep them updated on the progress of the philanthropic venture to ensure recurring donations.

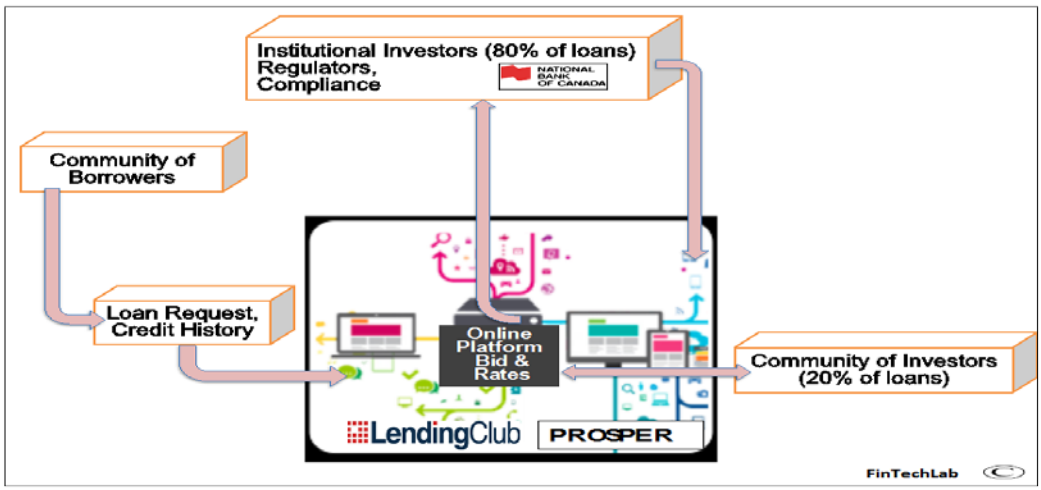
Figure 7. Kickstarter Business Model



Equity – Equity crowdfunding takes place when a promoter wants to attract venture capital from the crowd instead of investment bankers. It generally includes the issue of shares, subject to compliance and national regulations. In the US, equity crowdfunding was made legal through the JOBS act in 2013. Canada lags far behind the US: Canadian provincial and territorial governments do not currently have a coherent vision or policy on FinTech and crowdfunding.

Peer-to-Peer Lending – An individual or a business uses a digital platform to borrow money from investors (individual or institutional). The exact role of the online platform can vary: some act as a middle-man and actually repay the lenders, whereas others merely act as matchmakers to connect borrowers with potential investors.

Figure 8. Peer-to-Peer Lending Model



A World Bank report suggests that crowdfunding and crowdlending may be the way for emerging countries to expand on an entrepreneurial level while avoiding the entanglements of traditional funding methods: "*Developing economies have the potential to drive growth by employing crowdfunding to leapfrog the traditional capital market structures and financial regulatory regimes… (…) Together, they have the ability to deploy up to US $96 billion a year by 2025 in crowdfunding investments.*" ("Crowdfunding's Potential for the Developing World", 2013). In this regard, crowdfunding and crowdlending may become a very powerful driver for growth across the world.

Disruptive Technology, Governance and Regulatory Responses

Disruptive innovations such as disintermediation, intelligent automated financial services, robo-advisors, and online private markets (dark pools, crowdfunding websites, angel platforms) challenge regulation and compliance. Regulators should reinvent their relationships with financial services and new FinTech business models via a new dialogue on regulation and compliance.

The Québec *Autorité des marchés financiers* (the "AMF") announced June 13 2016 the creation of a FinTech task force. Its primary mandate is to analyze technological innovations in the financial sector and anticipate regulatory and consumer protection issues. According to the AMF's Superintendent of Client Services and Distribution Oversight, Mr. Eric Stevenson, « *technological innovation has a great potential to create wealth. However, this phenomena comes with a number of serious risks and issues that we have to mitigate and understand adequately. On the one hand, consumers and investors rightly expect to be properly protected from increased risks of fraud and breach in personal data protection arising from the use of innovative financial technologies. On the other hand, new generations of consumers and investors request that industries embrace technological trends. For regulators, the challenges are significant* ». (Source : FinTechLab interview with Mr Stevenson)

Because they are often outside of regulatory restrictions, FinTech startups challenge regulators. This challenge, however, represents an opportunity to develop new 21st-century regulation models with the use of the online intelligent technologies supporting the FinTech ecosystem, including real-time transaction analysis, online registration, standard data formats, automated reporting, open-source compliance systems, and big data analytics. RegTech

(amalgam of technology and regulation) startups are already exploring the regulation and compliance market.

Conclusion and Research Agenda

FinTech will completely transform financial services all over the world, the ultimate goal being a frictionless market with no transaction costs. In every case, the advent of digital technology will benefit the customer: new services will meet or exceed expectations, and will often provide a product or service that is superior to that of the traditional industry. Academics have a plethora of new research avenues: How does FinTech create value? How will smarter, faster machines transform capital markets? How will customer needs and behaviours change in a cashless payment ecosystem? Why is there an odd mismatch between the attitudes of FinTech entrepreneurs and compliance practitioners? How will FinTech transform the insurance industry value chain? What is the social return on investment (SROI) of the FinTech industry? What will be the impact of FinTech on future employment and the job market? How will the cyber security landscape develop? How did Hong Kong become the world leader in FinTech? Should countries develop a vision and a national policy like the United Kingdom's report, *FinTech Futures – the UK as a World Leader in Financial Technologies*? And finally, how does one explain the relatively slow development of FinTech in the Eurozone?

References

Bruene, J. (2015). Fintech Unicorn List, 46 Have Arrived + 38 On Their Tails. Retrieved from http://finovate.com/fintech-unicorn-list-q2-2015-46-arrived-37-closing-in/.

Conner-Simons, A. (2016, Jan 26). Web Inventor Teaches Web Course – Learn About "Internet of Things" Through EDX. Retrieved from https://www.csail.mit.edu/iot_professional_education_course_2016.

Economist (2016, January 30). Against the odds: Going where few startups have gone before. Retrieved from http://www.economist.com/news/finance-and-economics/21689641-going-where-few-startups-have-gone-against-odds.

Ernst & Young (2015). EY FinTech Adoption Index. Retrieved from http://www.ey.com/GL/en/Industries/Financial-Services/ey-fintech-adoption-index.

Kahn, J. (2016) Baidu Looks to Artificial Intelligence to Reduce Insurance Risks, Bloomberg, January 20.

Lacasse, R.M., Lambert**,** B.A, Roy N, Sylvain J. and Nadeau F. (2016)**.** A Digital Tsunami: FinTech and Crowdfunding. In International Scientific Conference on Digital Intelligence. April 4-6, Laval University, Quebec City, Canada.

Lacasse, R.M., Lambert**,** B.A, (2016)**.** Cracking the Code of Successful FinTech Startups, 20th International Prospectics Conference (ESTIA) Biarritz, July 7-8, France.

Lacasse, R.M., Lambert**,** B.A, (2016)**.** Creative Disruption in Financial Services: FinTech and Crowdfunding, 7th International Research Meeting in Business and Management, Nice-Sophia-Antipolis/ IPAG, Nice, July 11-12.

Mintzberg, H. (1979), 'Organizational Power and Goals: A Skeletal Theory', in D. Schendel and C. Hofer (eds). *Strategic Management: A New View of Business Policy and Planning,* Boston*:* Little, Brown and Co., pp. 64-80.

Sainato, M. (2015, August 19). Stephen Hawking, Elon Musk, and Bill Gates Warn about Artificial Intelligence. Retrieved from http://observer.com/2015/08/stephen-hawking-elon-musk-and-bill-gates-warn-about-artificial-intelligence/.

Stern, K. (2013). Charity for All. Doubleday, NY, p. 106.

Teece, D.J. (2010) Business Models, Business Strategy and Innovation, Long Range Planning 172-194

Wills, D. and Jablonska, K. (2015, June 12). Les leaders du *crowdfunding* aux USA et en Europe. Retrieved from https://www.comparelend.com/news/fr/2015/12/06/les-leaders-du-crowdlending-aux-etats-unis-et-en-europe/.

World Bank (2013). Crowdfunding's Potential for the Developing World. Retrieved from http://www.infodev.org/infodev-files/wb_crowdfundingreport-v12.pdf.

World Economic Forum (June 2015). The Future of Financial Services. Retrieved from http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf.

Acknowledgement

The authors wish to acknowledge the magnificent support of the FinTechLab's research team: Jose Omar Cardenas Luza, Claude Couture, Nicholas Roy, Jean Sylvain, Roberto Genest, Hazel de Neeve, Francis Nadeau, Éric Osmani, and Philippe Desharnais.