

**CIPF Podcast Series – Innovation**  
**No. 15 – The Evolution of Fintech and the Way Forward**

Transcript<sup>1</sup>

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Speaker: Frank Barillaro

Intro:

You are listening to the Canadian Investor Protection Fund podcast channel. Here, we connect with industry leaders and experts in the financial sector.

Ilana Singer:

Hello and welcome to the CIPF podcast series focused on innovation. I'm Ilana Singer, vice president and corporate Secretary at the Canadian Investor Protection Fund, or CIPF. I am so pleased to be your host today.

Our topic is The Evolution of Fintech and the Way Forward. I am here today with Frank Barillaro, the managing director at the Everton Carlisle Group. In this role, Frank provides insights and expertise in the areas of capital markets, technology, market surveillance, and the regulatory landscape more broadly.

Frank is also a senior director at National Bank Financial in Montreal, Quebec, and has been an active member of the Crypto Asset Working Group created by IIROC, the Investment Industry Regulatory Organization of Canada. He is certified in the areas of artificial intelligence, or AI, and blockchain. Frank was also a distinguished speaker at the CIPF 50th Anniversary Forum several years ago. Frank, welcome. It is such a pleasure to have you here with us today.

Frank Barillaro:

Thank you, Ilana for the nice introduction. It's a pleasure for me to be with you here today.

Ilana Singer:

Turning now to the matter at hand, our topic for today's podcast is "The Evolution of Fintech and the Way Forward". We will be focusing our discussion on financial technology, or fintech for short.

We'll discuss how fintech innovations are being embraced by firms in the financial services industry and how regulators are adapting to them. Finally, Frank will share his thoughts about future trends in the area as they unfold over the next several years.

First, why don't we start with a foundational question? Frank, please explain the term fintech to our listeners.

Frank Barillaro:

Certainly, Ilana. Fintech stands for 'financial technology' and refers to new technology competing with traditional methods of delivering financial services. Think of digital banks, for instance. When you think of fintech firms, it's not just startups. You have both startups and established financial institutions as well as some tech providers and their goal is to try to replace or enhance the current offerings.

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<sup>1</sup> This transcript has been edited for clarity and ease of reading. This podcast is for informational purposes only and is not intended to constitute advice of any kind.

The reason why they exist is because there have been a lot of technological breakthroughs throughout the years. Think about it as the first four letters of the alphabet: A, B, C, D. The four areas that are predominant in fintech are A for artificial intelligence, B for blockchain, C for cloud computing, and D for big data. Those are breakthroughs that enabled new entrants into the fintech space and existing financial institutions and technology providers to utilize this new technology. One of the areas that should not be underestimated is cloud computing.

The event of cloud computing has given access to technology, to new entrants where otherwise this technology would have been kept only for very, very large institutions. Those are really the areas that fintech focuses on, the A, B, C, D of new technology.

Ilana Singer:

Thank you, Frank. I am sure that our listeners found your description and examples very helpful. I certainly did. I won't forget the A, B, C, Ds of fintech, so thank you for that.

Now, turning to how these technologies such as the A and the B, AI and blockchain, how are those being used by firms in the financial services industry? From your perspective, are clients' day-to-day activities and decisions being impacted by how the industry has been implementing these technologies?

Frank Barillaro:

Sure. Let's start with blockchain technology. Let's break it down and think of blockchain technology as a systemic type of innovation. For example, in Canada we have a financial ecosystem that is quite complex. We have the Bank of Canada, we have Payments Canada, we have marketplaces such as exchanges, we have broker-dealers, financial institutions, we have technology providers, we have regulators. All of these moving parts are part of our ecosystem. Within the ecosystem, there are payments that are being made, there are transfers, transfers of ownership, changes in ownership, and this entire ecosystem requires trust. That's where blockchain comes into play. It has some native functionalities that systemically enable that trust.

Let me give you an example. Let's say you would like to buy my cell phone. It's a quite simple transaction if we are sitting next to one another. I can give you my cell phone, you can inspect the phone, you can take a look at it, and we can then negotiate a price that we both agree on, and then it's a simple transfer. I give you my cell phone, you give me your payment, and the transaction is completed. However, what if we are not sitting next to one another? Say we are miles apart. You won't want to send me your money unless I send you my phone and I won't send you my phone unless I have your money first.

That's where clearing houses come into play. They will be an intermediary that's going to guarantee the transaction. They are going to assure you that you are getting the actual phone that you should be getting, and they are going to assure me that I am going to be getting payment for that phone. The thing is that they don't do it for free, they charge a fee, and they also take on collateral. There's slippage in the efficiency, but it's necessary. You must have that trust, so those intermediaries like clearing houses and depository, that is the role they play in the ecosystem.

Same thing if we send money abroad; we don't actually take money, put it in an envelope and then sit it on a plane and then it gets to your family member abroad. It's really a series of entries into different ledgers from different financial institutions that takes place. Each financial institution guarantees the payment to the other financial institutions, because they have access to a ledger – they can see that the funds are there, and are available.

All of this is a lot of slippage, or there is a lot of inefficiencies because there are so many intermediaries at play. The blockchain has native technology functionalities that make these transactions simultaneous. If we go back to my example of selling you my telephone, it is done on a blockchain simultaneously so that doesn't require a third party guaranteeing the transaction to take place. It's really through the use of

something called smart contracts that blockchain technology gets utilized to the maximum of its capacity. Smart contracts are essentially something we see in the swap world. A swap is essentially one counterparty buying a variable rate in return for a fixed rate, for example. The way it's done right now, it's technically via a contract, an ISTA agreement, and the contract requires each party to make sure that the obligations are met, that their obligations are undertaken, and the counter party's obligations are met as well. It's very manual, it's very cumbersome, and there could be some errors. With blockchain technology, you have the opportunity to create these smart contracts which would replace these ISTA agreements, and therefore make the exchange of cash flows simultaneously without any slippage.

When you think of something like blockchain, I think you should think of something that is a systemic innovation, and so for the consumer, they won't see the difference. The only difference they may see is that in the long run, it would be lowering costs, because there's less intermediaries. In terms of security, the information flowing through various intermediaries may be intercepted with traditional finance. Whereas on a blockchain, you reduce that risk enormously, because the blockchain technology has embedded cryptographic security within its system.

In traditional finance, we know that trying to get a clean audit trail is very, very difficult because of so many systems and moving parts and intermediaries. When you are utilizing a blockchain, you see from the onset what has been done because it is transparent. Every transaction is tracked and recorded simultaneously, and these recordings are immutable. They cannot be changed. For example, if one day we have a digitized Canadian dollar and it's on a blockchain, we won't need to hire accountants anymore to pay for income taxes because it will be done simultaneously directly on the blockchain. You will be able to see what revenue each person is generating and also where their tax money is going. The transparency and the security will also make it more difficult for malicious actors to commit fraud. That's for the blockchain piece.

The second part of your question was surrounding artificial intelligence. Most specifically, what brokers and the financial institution are using is machine learning, which is basically learning from behaviors and patterns in order to predict future behavior. If I give you an example, I am a big music fan, and I love Spotify. Spotify uses machine learning to try to anticipate your tastes in music. Imagine if they didn't use machine learning. All you would do is look for music that you already know, whereas because they are using machine learning, they are able to look at your playlists and look at people with similar playlists and look at what they listen to in addition to the things that you have in common. Then they are able to make suggestions in that direction, so it is a wonderful way for you to discover a bunch of new music that you otherwise would never have fell on. That is a simple and easy example of how machine learning is used and it is used every day by many, many institutions.

In the financial industry, why it is being used more and more now is because there is much more data available. The availability of data is what greatly enhances the business case for machine learning. Because of all of these data sets, institutions are able to proactively monitor customer behavior, so they will know, for example, depending of where you are in your life, if you may need a mortgage soon, if you are on the verge of retirement, and based on those data points, they can offer you services really tailored to your needs.

Another way that institutions use machine learning is to identify anomalies and they are able to do that in real time in order to reduce fraud or malicious actors from acting. Also, it can learn to reduce false positive. In machine learning, you have this continuous cycle of learn, test, and refine, and that is what makes the system better and better and better. One of the best examples that has been given on how the machine can learn is, for example, if you take a quite simple video game called Space Invaders, it is a video game where the objective of the game is to stay alive and shoot down as many space invaders as possible. If you take a human, it will take a human probably hours if not months, and maybe even years before they become extremely proficient at this game.

What they have done is they have experimented with machine learning in order to program a computer to play the game, and basically, overnight, the machine was able to never, ever lose at this game again, so it

was able to stay alive and shoot a maximum amount of space invaders in an eight-hour period. That is all it took, eight hours and the machine was optimal, it would be able to play forever. It recognized the pattern, it understood what it needed to do and basically learn from it, so there is no chance that a human can do it as fast as a machine. That is why these two technologies in particular, blockchain and machine learning, are probably two of the most powerful technologies out there right now.

Ilana Singer:

Thank you, Frank, for your detailed answer. Your description of the systemic innovations in terms of blockchain and machine learning really resonated with me. I am sure that your examples from the music industry and from video games like Space Invaders certainly resonated with our listeners. It is remarkable how far fintech has progressed over the last few years.

Now, shifting gears, let's explore this topic from a regulatory perspective. Frank, how do you see regulators adapting to these innovations? How have you observed their use of technology in the supervision, oversight, and regulation of firms?

Frank Barillaro:

That is a very interesting question, Ilana. Technology is evolving at incredible speeds and it is very difficult to keep up. It is very difficult to also run after every new technology that comes up, so it becomes a challenge. There is a subset of technology providers called "regtech" for regulatory technology, and they are adapting their solutions for either regulators, or compliance departments at financial institutions. They specialize in using the same kind of technology, whether it's cloud computing or machine learning, in order to create solutions that respond to the needs of regulations and compliance.

I would say that the most important element for regulators is to make sure that the market integrity is maintained. Markets must remain fair, consumers must trust that the game is fair, and so I would think that access to data becomes key. In Canada for instance, we have transparent markets with transactions that take place on a marketplace versus bilateral markets, or OTC markets, where that information is not as accessible. I think that if I look at our counterparts in the U.S., also in Canada, the regulators are trying to make those markets as accessible and transparent as possible. I think that is going to be a key challenge because there is a lot of data that is very opaque right now. To take that data and making a database out of it so that you can make it speak, that is the number one challenge I see – getting the right data. It all starts with data.

The second thing, I think, is that the idea of cross-asset monitoring is going to become more and more the norm. What I see is that in the past, you had regulations by asset class, and when we look at the activities that take place in a financial institution, it's not the way it works. Really, you have different desks and different business users that use more than just one asset class and so you have to make the connections between all of the different asset classes, so the cross-asset monitoring is really the only way to go if you don't want to have a huge number of false positives, and if you want to see if there is any potential breaches, I think that there is no other way than to look at the market from a cross-asset perspective.

Finally, the last piece, I think, is to create out of it all comes down to data regulators have the ability to go and get as much data as possible to create these data lakes that contain both structured and unstructured data, and then utilize machine learning to make that data speak. For example, when we talk about structured data, you have all of the data sets that we are used to something; think of an Excel spreadsheet. When you think of unstructured data, then you are looking at voice, video, email data that can come in so many different forms and formats. The technology is now very proficient in connecting the dots between structured and unstructured data, so I think that there are gains to be had just in creating a data lake that contains those types of data and then implementing machine learning on it.

Ilana Singer:

Frank, thank you for sharing these helpful observations with our listeners. It is key, based on your observations, that regulators focus on increasing accessibility and transparency in markets and it sounds like these innovations can really help in that regard.

Now, when people think about fintech, they often turn their minds first to crypto assets. Crypto assets have been featured front and center in the headlines over the past several years. Regulators in Canada, like many of their international counterparts, have been turning their attention to regulating and supervising crypto asset trading platforms. How do you see crypto assets evolving in Canada and globally, particularly as regulators are becoming more involved in the regulation and supervision of the sector?

Frank Barillaro:

Let me start by saying that first of all, in my opinion, an unregulated crypto asset market would be basically like buying medication from someone's trunk of a car; it is not advised. When you buy medicine, you require a prescription from a doctor, the doctor must be certified, has to have gone through a bunch of proficiency, has to be on the board of a medical board, and so we require a certain amount of governance surrounding the buying of medication, and then you get it from a pharmacy, not just any person. It is the same thing in financial markets, so I would say that an unregulated crypto asset market is really, really not advised, so it makes perfect sense that it would be regulated.

That doesn't mean that there is no challenge in that. It is difficult because crypto assets' markets usually go beyond the borders of a nation, so if the market is international, there is no nation, so it becomes very difficult. I think at the minimum regulators, what regulators can do is to regulate what's within their borders. When you compare it to, let's say, buying stock on an exchange, before a company can be listed on an exchange, there is a bunch of due diligence that is done by the marketplace, by the exchange itself, by the regulators, and there's a bunch of proficiency requirements before a stock can be listed on exchange. Once it is listed on exchange, there is also a lot of obligations, having external auditors look at your financial numbers, and so on and so forth, so there is a lot of due diligence that goes into place.

My concern is with crypto assets – anybody that knows anything about blockchain can create their own digital asset. I think that, again, regulation is extremely important here. For example, here in Canada, the regulators did not allow for the listing of binary options. We banned binary options because we think they were not in the best interest of the public. I think that there is no question that the crypto asset market will exist and should be regulated, and eventually, when you think of crypto assets, it is not just a currency like a Bitcoin, but also a digitized form of stock. Rather than having a stock on a database, the stock will be listed as a crypto asset on a blockchain.

Again, for the consumer, this doesn't make any difference for the consumer, so think of it like having a car, and the car can have many different types of engines. You can have an electric engine, you can have a gas engine, you can have a steam engine, hydro-carbon engine. What the consumer knows is that when they press on a pedal, the car advances. The mechanisms behind that are irrelevant for the consumer. The crypto asset market is based on blockchain, which is the technology that underlies the crypto asset. For the consumer, it should be completely transparent, no difference. What that does, though, is it allows, again, for a lot of transparency and regulators will be able to verify things in an incredible way, so that data will be there, the audit trail will be there in an immutable way, so I think for a regulatory perspective, it is an absolute must, and I think it is going to be where all assets will eventually wind up on.

Ilana Singer:

Frank, your observations has given me, and I am sure our listeners, a lot to think about, particularly from a regulatory perspective. I will say that at CIPF, we have been examining the area of crypto assets as well, particularly in the context of CIPF coverage. As our listeners may know, CIPF returns missing client property when a member firm becomes insolvent. When we are making a determination about whether or



not a loss is eligible for coverage, we examine three key points. First, is the individual an eligible customer? For example, not a director of the firm or an individual who contributed to the firm's insolvency. Second, did he or she have an eligible account, that is one that's used for the trading in securities or commodity in futures contracts? Finally, are there eligible assets within the account such as securities or cash? At this time, crypto assets are not considered eligible assets, and would therefore not be eligible for CIPF coverage. This has been communicated and discussed with regulators and firms.

We at CIPF are continuing to monitor developments in the crypto asset space, and we have continued to be engaged in discussions with regulators as well as with current and prospective member firms. We really are trying to stay up to date, for example, through this podcast with you, Frank, an expert in the area, trying to stay up to date on current developments in the fintech area more generally and specifically with respect to crypto assets. Now, unfortunately, we are coming to the end of our discussion, and we are going to be wrapping it up. I know that our listeners would be very interested in looking into the future. How do you see fintechs evolving in the Canadian and global financial markets? What potential do you see?

Frank Barillaro:

I think that there is great potential for fintechs in the Canadian market. The reason I say that is because the fintech startups represent the largest portion of venture capital investments. That is a great indicator of the confidence by investors that the fintechs are addressing pain points that are real.

The second thing is I think that blockchain will evolve. It's a relatively recent innovation, and basically, you had a handful of people that really understood the mechanics behind it and the technology behind it and the programming behind it. I think that soon you will have it part of the curriculum in universities, and we will be moving away from having blockchain applications, and rather have blockchain platforms a little bit like we have on our phones where the invention of platforms for telephones has made the phone smart. Before that, all we could do is call and get messages. Now, we can actually use our phone for many, many different things. I think that the same will happen on the blockchain front. Perhaps the bigger players like the Googles, the Microsofts, the AWSs, the Amazons, maybe they will be at the forefront. But think of blockchain as becoming more and more of a systemic innovation and more and more of a platform.

We talked earlier about the A, B, C, D of technology innovation. With artificial intelligence, blockchain, cloud computing, and big data, I would add two important innovations as well that are coming in the pipeline, and that is quantum computing, and probably the most important one is to have a Canadian digital dollar. I would say that we are maybe seven to 10 years away from having that. Once you have that now, you can completely change the ecosystem, and the way it works. The ecosystem can now be entirely on a blockchain, including the payment piece.

I think that it is necessary for all nations to have their own digital dollar because it is attached to monetary policy, so the idea of having a Bitcoin become a global currency, I think that that doesn't hold any water in economics, so I think that once this perfect storm occurs, where you have this innovation combined with the availability of data, the internet of things combined with a digital Canadian dollar, I think that you completely upend the Canadian financial ecosystem.

What that can cause is a quite important socioeconomic impact, and so you can't just rip and replace it because there are so many intermediaries. You have from banks to broker-dealers to all of the different intermediaries who on their end, they are fighting to remain relevant, so I think that you can't just rip and replace, you need to transition into a new state because of the socioeconomic impact that it can have; a little bit like we are doing with oil right now. Those are my thoughts in a nutshell in the time we have. But I think that there is going to be more and more and more innovation as we go by, so stay tuned for more information on that.

Ilana Singer:

Well, Frank, it sounds like we will have to do a sequel to this podcast given the additional innovations that will be taking place in the not-too-distant future. I must say that it has been an absolute pleasure speaking with you today. It has been thought-provoking, informative, and interesting, and I wanted to thank you again for taking the time and joining me on this podcast. It really has been a pleasure.

Now, three key takeaways that I have drawn from our discussion today are, I would say first the A, B, C, Ds of fintech. As I said earlier, I will not forget this: AI, blockchain, cloud computing, and big data. Then you supplemented that with two other important innovations: quantum computing and the introduction of a Canadian digital dollar.

The second key takeaway that I observed today was about the advent of the two key systemic innovations, blockchain and machine learning, and how those are transforming the way that the financial services sector is applying innovation within the sector.

Finally, from a regulatory perspective, regulators and regulation will be very important in the coming years, and particularly, as you noted in the crypto asset sector. As well, market integrity is key, must be maintained, and markets must remain fair in the face of all of these various and fast-moving innovations.

That concludes today's podcast. I would like to thank our listeners for their attention. I hope that you've found this discussion as informative and thought-provoking as I have. We always welcome your comments. The best way to reach us is through our website. Finally, we invite you to listen to CIPF's other podcasts available on our website and podcast channels, or feel free to read the transcripts, which are available in both English and French on our website. I'm Ilana Singer. Thank you again for joining us and goodbye for now.

**Outro:**

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