Business in the Front, Crypto in the Back: How a Finance SME Turned to a Blockchain Startup, Novera Capital, for Innovation

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Abstract:
We present the journey by which Novera Capital, a blockchain start-up, partnered with Sigma Analysis, an SME investment firm actively looking for opportunities to leverage disruptive technologies. We believe that the key to this journey is expressed in Novera’s “Business in the front, crypto in the back” perspective. Finance is highly regulated and conservative. So, Novera would not have been able sell its concept for a novel bitcoin tracking fund that received over $1M in venture capital without its corporate ethos: Novera would be able to walk into any boardroom and clearly demonstrate compliance to regulations, and moreover show that their business practices would meet stringent expectations of large financial institutions. At the same time, it is Novera’s vision to innovate beyond the fund to a blockchain-based token platform that keeps its team of technologists motivated and forward-looking. We advise others weighing investment in blockchain, especially SME’s and start-ups in finance, to understand and manage this dichotomy.

Keywords:
Finance, bitcoin, blockchain, start-ups, SME’s,
Introduction

In February 14, 2019, JP Morgan announced that it “became the first U.S. bank to create and successfully test a digital coin representing a fiat currency. The JPM Coin is based on blockchain-based technology enabling the instantaneous transfer of payments between institutional accounts.¹ In the evolution of nascent blockchain technology, this announcement is significant for several reasons. One, JP Morgan is one of the most venerated financial institutions in the world and is the largest US bank with assets of 2.45 trillion dollars.² Two, its CEO, Jamie Dimon, is arguably one of the best-known CEO’s of the world, and business world took notice when he stated that bitcoin was a “fraud” in September 2017.³ He also said then that he believed nevertheless in the long-term potential of the blockchain technology that underlies bitcoins and other cryptocurrencies. Three, JP Morgan’s seeming embrace of the press coverage may be a signal that they and other global financial institutions are finally ready to scale up beyond Proof-of-Concepts (PoC’s). JPM Coin launch may be a critical affirmation of the journey that started in September 2015 with the formation of the R3 consortium.

R3 was founded by key global banks including JP Morgan, Goldman Sachs, Bank of America, as well as Barclays, Credit Suisse, Deutsche Bank, HSBC, and Mizuho Bank.⁴ Its aim was to jointly investigate the potential of blockchain technology to disrupt global finance. They chose the “T+3” problem as their litmus test. That is, if blockchain could address this massively complicated problem, then it would prove that blockchain as a technology works. This problem refers to the reality in global capital markets that it may take up to 3 days after a trade execution for the trade to officially settle. There is a complicated system of intermediaries including clearing houses, brokers, and banks that need to be involved to confirm the legitimacy of a trade. R3 believed that blockchain use could displace this system of intermediaries, not only reducing the time to settlement to 1 day but also drastically reducing processing costs.

Since then, a lot has happened. The price of bitcoin went from $400 when R3 was formed to nearly $20,000 in January 2018, before collapsing.⁵ As of March of 2019, the price has stabilized around $4,000. Hundreds of cryptocurrencies were minted in Initial Coin Offerings (ICO’s) and their prices followed the trajectory of bitcoin’s. In fact, the majority of these coins are now worthless. Blockchain found traction in other applications such as providing farm to fork traceability for ensuring food safety,⁶ bookkeeping for decentralized electricity micro-grids,

² https://www.jpmorganchase.com/corporate/investor-relations/investor-relations.htm
⁵ www.coinmarketcap.com
and many others. R3 has grown to represent over 200 financial institutions. Interestingly, JP Morgan left the initiative in the spring of 2017, having learned enough to undertake blockchain projects on its own. And R3 all but abandoned trying to solve the T+3 problem; institutions discovered they were so enmeshed in the incumbent system that it would have been too disruptive and not compelling enough to switch to a blockchain-based system. However, as JPM Coin launch exemplifies, financial institutions have found other, more tractable use cases for blockchain.

Consortia like R3 play a very important role in blockchain innovation, much more than other technologies like AI and Analytics. Why? When an industry is trying to disintermediate an existing system of intermediaries (as with R3’s T+3 use case) or it is trying to develop a system in the absence of intermediaries (as Walmart, IBM, Nestle, Unilever, and others are doing for IBM’s Food Trust Blockchain), its stakeholders need to band together to fulfill the functions that would otherwise have required intermediaries. It has been theorized that complex systems used between organizations such as transportation and manufacturing systems innovate as multiple stakeholders participate via consortia. Technology uncertainty risks are then spread across stakeholders rather than borne by individual companies. Blockchain technologies certainly fall within this category, so unsurprisingly then, there are even other active consortia for industries such as commercial insurance (B3i) and transportation (BiTA). There are also the two biggest consortia to develop blockchain technologies—The Hyperledger Project, and Enterprise Ethereum Alliance.

In spring 2018, there were over 60 blockchain consortia active globally. Deloitte’s survey of over 1,000 managers in 2018 found that 29% said that their organization was already participating in a blockchain consortium, and 45% stated their organization was likely to join one.

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soon. So, it seems that participation in consortia is a very conventional way to commit to blockchain adoption. However, not all companies are invited to participate in a consortium. Small and Medium Enterprises (SME’s) can be shut out. This is especially disadvantageous in light of a study that found that the three key factors that influence blockchain adoption are top management support, organizational readiness, and organization size. Smaller organizations may have the willingness to adopt blockchain technologies but may lack requisite resources and technical know-how. And if they are shut out of consortium participation as well, how do they keep pace in a competitive environment where 84% of 600 executives globally state that their organization is actively involved with the technology?

The answer lies in externally focused strategies for absorbing disruptive technologies into a firm, as espoused in Clayton Christensen’s *The Innovator’s Dilemma*. One more-tactical strategy entails having on-going dialogue with top-tier scientific researchers and venture capitalists. Another is to explore efforts such as partnerships, licensing agreements, joint ventures, taking equity positions in, and outright purchase of startups with expertise in the disruptive technology. For SME’s in financial services—or really any industry that is potentially disrupted by blockchain technologies—these external strategies must be seriously considered.

In this paper, we detail a case study of a how *Novera Capital*, a blockchain start-up, engaged *Sigma Analysis*, an SME in financial services, to execute these strategies. We believe this case provides a rough blueprint for how small companies, particularly in finance, can accrue valuable experience with the disruptive technology that is blockchain, and even open new markets and opportunities as blockchain further disrupts their industry.

**Background: Sigma Analysis**

According to Christensen, potentially disruptive technologies pose a dilemma for successful companies that provide incumbent technology or service. If these firms focus on their successes, they often forgo the opportunity to fully invest in technology that could render incumbent technology obsolete or uncompetitive in the future. Yet, if they devote resources to every potentially disruptive technology, they risk deflated profitability and the ire of the shareholders whose quarterly earning expectations may not be met. Once-dominant firms like Kodak failed to invest in disruptive technologies like the digital camera because they were reluctant to deviate from a very successful formula. Upstarts who have no such history then take the risk of exploring novel technologies even if they are initially of low performance and serve small niche markets. By the time that a technology becomes truly disruptive, and its performance meets needs of a large market, the head start that the upstart has enjoyed cannot be overcome by the once-dominant firm. Even in the context of SME’s, this dilemma exists: After all, SME’s

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especially do not have resources to focus on an incumbent technology and explore a potentially novel one.

There are suggested remedies for the dilemma that apply. Internal strategies like developing a portfolio of speculative projects or regular staff rotation work much better for larger firms that can afford them rather than SME’s. Externally focused strategies such as dialogue with experts in universities and venture capitalists and working with start-ups are applicable independent of size.

At the beginning of 2018, like most firms in their industry, *Sigma Analysis & Management*, an investment management firm based in Toronto, Canada, sought to capitalize on, or at least learn much more about, the opportunities in bitcoin and other cryptocurrencies, as well as blockchain technologies that provide the data infrastructure for these “cryptos.” By the end of the year, Sigma’s partnership with Novera represented the effective execution of the above-mentioned externally focused strategies: Through Novera, Sigma connected with a leading university research lab in blockchain, venture capitalists who specialize in investing in blockchain companies, as well as Novera, the start-up, itself.

Sigma was founded in 1999 to advise institutional investors in hedge fund portfolio construction and risk monitoring. They currently have 10 employees, which classifies them as an SME. Incubated from the world-famous Fields Institute at the University of Toronto, they specialize in providing investment services and products that use sophisticated risk management and pricing models to hedge funds, pension funds, and other institutional investors.

Sigma made their name in 2008 when portfolios built using their risk analysis models outperformed most others’ during the Financial Crisis. Sigma was in fact a disruptor. As a result of their success, however, other asset and portfolio management firms have incorporated similar models. As fintech innovations like AI applications, robo-investing, and open banking disrupt the field of finance, Sigma understands that it must keep up. However, with a small staff of professionals trained in finance and mathematics, they recognize the difficulty in cultivating technology expertise in-house. A chance meeting between Sigma and some blockchain researchers at the beginning of 2018 started a journey—one that led them to not just better understand a disruptive technology, but to potentially position themselves to be on the leading edge of another disruption.

**Background: Novera Capital**

Charlie Shier and Marek Laskowski attended a mathematical finance conference in January 2018. During the conference, which was organized by Sigma, Shier and Laskowski got to know Sigma; Shier and Laskowski were blockchain researchers who understood finance as a leading

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22 Field Institute annually awards the Fields Medal. Given that a Nobel Prize in Mathematics is not awarded, the Fields Medal constitutes the highest professional honor for a mathematician.


application area for blockchain, and Sigma wanted to understand blockchain much better. Laskowski and Henry Kim were professors at the Schulich School of Business in Toronto’s York University who founded the blockchain.lab in 2015, and Shier had worked at the lab over two summers as a student researcher before going off to Harvard Law School.

A month after the conference, Shier called Laskowski and Kim to tell them of an idea he had. The price of bitcoin had skyrocketed to nearly $20,000 and was starting its eventual steep descent when Shier was looking into ways to short it. He found that there was no easy way to do this. Although both the Chicago Mercantile Exchange (CME) and the Chicago Board Options Exchange (CBOE) started trading bitcoin futures in December, the futures were so new that liquidity was relatively low. Shier risked taking unfair prices to buy and sell short futures. In addition, these are not put options, so he risked unlimited losses if bitcoin prices resumed its straight ascent. When he explored actual put options, they could only be traded in unregulated markets with extremely low liquidity that are susceptible to manipulation; he would receive truly unfair prices to buy and sell. Finally, there was no publicly traded bitcoin short ETF or fund.

Shier had an idea to structure a financial instrument that he believed was not subject to these shortcomings. Laskowski and Kim said that they couldn’t punch holes in his idea. As blockchain.lab co-founders they were pitched many cryptocurrency and blockchain ideas, most of them terrible, and they quickly recognized that Shier’s had merit. Laskowski and Kim offered to help where they could but suggested that Shier seek partners in his venture with expertise in financial markets. The next time he called, Shier announced that he and Jacob Unger co-founded a start-up to commercialize his idea.

Based in New York, Unger believed in crypto. When he heard about bitcoin and Ethereum, he learned to program, closed his foreign exchange fund and moved many of his investors into a crypto-trading fund he started. As that venture took off, he started to realize the risk he was taking. Inasmuch as the bitcoin and Ethereum networks are extremely robust to manipulation, the digital wallets that hold their cryptocurrencies are famously vulnerable. There are numerous stories of hackers siphoning off funds from wallets or lost security keys rendering wallets forever inaccessible. He was holding his investor’s money in wallets, where even though he could assure their security now, he couldn’t be as confident if his fund grew. When he and Shier met at the behest of a venture capitalist, he was impressed that Shier’s idea could alleviate his worries in addition to addressing the difficulty of shorting bitcoin. In March 2018, Shier and Unger co-founded the start-up that would eventually be named Novera Capital.

Business in the Front: Long-Short Funds

In spite of Shier being a registered student at Harvard and Unger living in New York, they decided to locate the base of their operations to Toronto. A good idea takes a start-up only so far,

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and what they needed was capital and technology. As arguably a top-five place for blockchain tech in the world, Toronto offered start-ups access to strategic capital and leading technologists. The prodigious leading force behind Ethereum, Vitalik Buterin, is from Toronto, as are other key founders. The thought leader that the corporate world most identifies with blockchain, Don Tapscott, is also from there. For Shier, Toronto is home; he could access his and his family’s business networks. Finally, Unger and Shier could access top blockchain technical expertise through the blockchain.lab and the lab’s social connections. So, they brought Laskowski and Kim on as advisors. Their plan worked! Within months, they had secured venture capital from a very knowledgeable Toronto-based investor, who held a significant portfolio of cryptocurrencies and was funding other blockchain ventures as well.

Novera considered raising money through an Initial Coin Offering (ICO). Given the frothy climate of 2017-2018, they could conceivably have raised tens of millions of dollars. However, they would have lacked legitimacy when meeting with financial institutions and regulators, since ICO raises in Canada had been deemed in violation of regulations. This decision established their corporate ethos: Novera would be able to walk into any boardroom and clearly demonstrate compliance to regulations, and moreover show that their business practices would meet stringent expectations of large financial institutions.

Novera retained the law firm and attorney who successfully persuaded the Ontario Securities Commission (OSC) to conditionally approve the first Security Token Offering (STO), a regulatorily compliant alternative to an ICO. They also communicated with all the Big Four accounting firms and chose one for audit of their financial instrument structure. During these efforts, Novera re-connected with Sigma when they realized that they need to partner with an asset/portfolio management firm like Sigma in order to operationalize Shier’s original idea.

So, what was Shier’s idea? It comprised of two funds with identical amounts invested in them that would offset each other. There would be a Long Bitcoin Fund whose shares’ value would increase at the same rate as a bitcoin rise, and there would be a Short Bitcoin Fund which would increase in value proportional to a decline in bitcoin prices. As a more recent Novera investor would remark, “so you guys are bookies… and I like that because bookies don’t lose money.” To maintain the offset, the most any investor could lose was their investment; the most they could earn was double. The diagram shows what would happen to the Funds when bitcoin prices reach

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29 Even though the US and Canada have different regulatory frameworks, the conventional wisdom on ICO’s is this. Unless a cryptocurrency, or “coin,” distributed via an ICO (usually over the Ethereum network, which has developed mechanisms and standards amenable for automated distribution and maintenance of tokens) is truly a utility token—think subway tokens—and hence does not look like a security, regulations technically forbid Canadian and US nationals to participate in coin offerings (see reference above). For the most part, regulatory bodies have not enforced this except in cases of outright apparent fraud. An STO represents a regulatorily compliant alternative. In early 2018, TokenFunder received pioneering acceptance into OSC’s LaunchPad, a program that shepherds innovative companies towards full regulatory approval and helps establish regulatory precedents and frameworks in the process.
$6,000, if investors initially invested $50M each into Long and Short funds when bitcoin was priced at $4,000.

![Figure 1: Overview of How Long-Short Funds Works](image)

Also, if bitcoin doubled in price to $8,000, the Long Fund holders would double their investment and Short Fund holders would lose it all. At that point, the Long and Short Funds would be recapitalized at an equal amount, and the values in the funds would fluctuate until another doubling event at $16,000 or until bitcoin’s prices goes to 0. Novera’s revenue model consists of collecting fees when investors bought or sold Fund shares, and income from deploying investors’ capital into very low-risk investments. This diagram shows the most regulation-friendly structure: Fund shares are not publicly traded on an exchange like an ETF or a mutual fund. Rather, the Fund investor buys and sells only through Sigma.

Recall why this idea was conceived. In this structure, as long as there is an agreed-upon closing price of bitcoin, say, at 4PM, there is an indisputable and auditable price for the Long and Short Fund shares. Fund liquidity and manipulation efforts by Fund investors cannot affect these prices. Buying into the Short Fund does not mean a potential for unlimited losses. Moreover, there is no custody risk of the kind that concerned Unger for his crypto fund. Since the Funds merely track bitcoin prices, there is no need for Novera to ever own bitcoins. Therefore, concerns about securing bitcoin wallets are moot. Novera or someone they appoint still needs to be in custody of fiat (USD or CAD) currencies with which investors buy into the Funds, but numerous providers know how to custody dollars, so the risk there is negligible. Finally, there is no counter-party risk. If Long and Short Funds have equal amounts in them, Novera as the bookie does not have to be a counter-party on a losing trade.

Since Novera is still in semi-stealth mode, further details of the long and short funds cannot be elaborated upon in this paper.

Shortly after re-connecting, Novera and Sigma started conversations to partner. Novera needed Sigma to market and sell the Funds to investors and manage those relationships because regulations stipulated that only qualified asset/portfolio managers like Sigma could perform these services. And Sigma was excited that Novera could help Sigma be a pioneer, especially in...
Canada, in giving “Wall Street/Bay Street” investors safe exposure to bitcoin and potentially other cryptocurrencies. Novera recognized that for the Long-Short Funds all their work boiled down to a concept that could be easily copied by, say, Sigma. By adhering to their corporate ethos, Novera had networked only with highly reputable institutions, and these institutions had attested to Sigma’s quality reputation. The partnership entailed Novera paying for Sigma’s services. Even if Sigma wasn’t the lowest cost provider, being able to place trust in Sigma was worth a premium.

To encourage collegial partnership, workers from Novera and Sigma had a kickoff social outing. Novera’s twentysomething founders convinced the party—with surprisingly little arm twisting required—to go to a bar frequented by millennials. Many in the party had started working at Sigma only a few years after Shier was born, and some at Novera were more than twice his age. That outing was a fitting synecdoche for the Novera/Sigma partnership: the young and the not-as-young working together, old tech trying to find its footing in the land of new tech, corporate vs. crypto. Jose Herrera, Lead Blockchain Engineer at Novera and another twentysomething, put it best when he said that night, “We’re like a mullet, except it’s like we’re business in the front, crypto in the back.”

**Crypto in the Back: Long-Short Tokens**

Herrera is unabashedly in the “crypto in the back” camp. He isn’t crypto in the sense that he is a volume trader of cryptocurrencies. It’s more that he really believes in the crypto ethos that blockchain, as he says, “could rid the world of extractive intermediaries and data hoarding infomediaries and give power back to the people.” He had come from Calgary to Toronto to be part of its blockchain scene.

Novera CTO Laskowski and Herrera are leading the development of the Long-Short Tokens, a blockchain version of the Long-Short Funds. Rather than using traditional financial markets facets like stock exchanges, prospectuses, and asset/portfolio managers, Long-Short Tokens would instead be traded on a financial services blockchain where much of the functions of these facets would be performed automatically using smart contracts. For now, this is on Ethereum, but it could be EOS, Stellar or any other promising public blockchain. Also, investors could go long-short in cryptocurrencies. For instance, if an investor wants to bet that bitcoin would rise against ethers, they would buy shares of the Long Token using their ethers. If they wanted to bet that bitcoin would decline against the dollar, they could buy shares of the Short Tokens using a stable coin like tether that is moored to the US dollar.

The diagram below graphically illustrates the complexity of administering the Funds, and why a simpler, less-intermediated flow on the blockchain would be compelling.

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30 Bay Street is the Wall Street analogue in Canada

31 A stable coin is a cryptocurrency that is tethered to the price of stable fiat currency, usually the US Dollar. Tether is a well-known cryptocurrency that is “tethered” to the USD. Using stable coins on the blockchain, payments can be processed, and transactions could be settled instantaneously and automatically across different jurisdictions even if they involve multiple fiat currencies. JPM Coins are stable coins that offer just this functionality.
Figure 2: Information Flow for Long-Short Funds

There are several intermediaries involved in this flow, and their responsibilities are as follows:

- **Novera**: Designer of the structure and Fund policies for redemption, order matching, etc.
- **Sigma**: Portfolio manager, licensed by the OSC to market, sell, and liaise with the investor.
- **Administrator**: Tasked with responsibilities such as evaluating that investor is not laundering (Anti Money Laundering [AML]), establishing that the investor is appropriate for this investment (Know Your Customer [KYC]), declaring an official Net Asset Value (NAV) of the Funds which incorporates actual Bitcoin prices less all fees charged to investors, as well as other routine clerical tasks.
- Though not shown, a financial institution would hold the funds in a low-risk investment.

The following diagram shows a revised design on the blockchain that introduces “lightweight” intermediaries.

Figure 3: Information Needs of the Long-Short Tokens on the Blockchain
Novera and Sigma spoke to one large Administrator, who said their minimum quote was in excess of $100,000. Such an intermediary would be considered “heavyweight,” and their service would entail significant human clerical processing—use of emails, transfer of spreadsheets, “sneakernet.” In contrast, Novera spoke to a vendor that did automated KYC/AML verification for bitcoin exchanges and charged a few dollars per verification. That would be considered a “lightweight” intermediary.

In the design of the Long-Short Tokens, the responsibilities of intermediaries needed for the Long-Short Fund would be split between Novera’s Long-Short Token smart contract, and lightweight services available on the blockchain. The calculation of the NAV would be performed by a smart contract and immutably recorded on the blockchain. At anytime, or even in real-time, regulators have a trail they can audit. This transparency and any-time auditability obviates the need for a heavyweight third-party Administrator to calculate NAV. Novera would however engage a highly reputable third-party bitcoin pricing service (or oracle) to provide a widely-accepted price of bitcoin. The choice of an official bitcoin price and then the calculation of NAV based off it are ostensibly two opportunities for price manipulation. However, the threat that Novera would concoct its own bitcoin prices is reasonable enough that use of a third-party is sensible, whereas a well-conceived blockchain design would negate the threat of Novera falsifying NAV calculations, assuming that bitcoin prices inputted in NAV are correct. In this design, there is no reason to overpay a heavyweight Administrator; a much less expensive pricing service could be employed, even while transactions are processed 24/7 and more rapidly. A similar argument can be made for use of a lightweight KYC/AML blockchain-based service rather than a heavyweight Administrator. Interestingly, another heavyweight intermediary not entirely necessary would be Sigma.

Whereas Novera has regulatory approval to launch the Funds, Laskowski, Herrera and others at Novera know that it may take some time to get this level of approval for their Tokens. Nevertheless, what binds the folks at Novera is their belief in blockchain as a disruptive innovation. The comparison of Figure 2 versus Figure 3 is an enticing visual for Novera; it compels the twentysomethings, and the not-so-twentysomethings, to work towards developing something really cool.

**Meeting the Regulator**

A real benefit of Novera’s corporate ethos of working only with well-established legal counsel and financial institutions including Sigma became evident when Novera went in front of the Ontario Securities Commission, which regulates financial markets in Ontario. There had been other similar firms that had come before the commission. This was beneficial as the commission was familiar with bitcoin and other cryptocurrencies, and because Novera showed itself to be very legitimate and well-prepared relative to others that had come in front of the commission with similar aspirations.

The OSC was quite positive towards the Long-Short Fund; Novera knew however that the timing was not right to even broach Long-Short Tokens. The commission advised that at that point, in December of 2018, Long-Short Funds should be made available only to accredited investors as a
private placement using Sigma as the registrant (the seller). The alternative would have been a
cirtual placement, which is the means by which ETF’s and mutual funds are bought and sold
through public exchanges like the Toronto Stock Exchange. There are slightly varying
definitions of what constitutes an accredited investor, but the key factor is reasonably high
wealth and income\textsuperscript{32}, which is deemed a proxy for sophistication of investment knowledge.
Regulators are inclined to protect unaccredited investors by placing a higher regulatory burden
for financial products to be traded on public exchanges where all investors can participate.

The OSC had many questions about bitcoin prices. They had heard reports of bitcoin price
manipulations, especially in foreign markets,\textsuperscript{33} and they had heard of wide price variances that
can occur between different markets.\textsuperscript{34} Though very open to the Long-Short idea, they wanted
more clarity that Long-Short Fund NAV and prices would not be based off a manipulated or
unfair price of bitcoin. The US Securities and Exchange Commission (SEC) also shares similar
concerns. This is why even though there have been numerous requests, the SEC has repeatedly
withheld approval for a publicly traded bitcoin ETF.\textsuperscript{35} Novera truly appreciates that this is a
boon. From the investor’s perspective, a bitcoin ETF would be a very familiar instrument and it
would draw away from potential Log-Short Fund investors. Plus, large players against whom
Novera could not compete would enter the market. Finally, short bitcoin ETF’s would surely be
available once the first long only ETF was approved.

Novera had conversed with the large financial data services about bitcoin price feeds. Companies
contacted included Bloomberg, New York Stock Exchange/ICE, and Thompson/Reuters. Even
these services were wary of price manipulation. Some provided data feeds from many different
bitcoin exchanges but were hesitant to put an aggregated index price to a given time. Unlike
most equities, forex and bitcoin trade on multiple markets. Unlike forex, however, bitcoin trades
in unregulated markets that can be amenable to price manipulation. Therefore, unlike forex, it’s
not as simple as saying that the price of bitcoin now is the last price at which it traded, and will
change when there is another trade. There must be index calculations that may weigh trades from
different exchanges differently and may discount questionable trades.

A typical private placement fund will be priced once a day. So, it would be acceptable if the
Long-Short Funds were priced once a day too. There are data providers who are willing stand
behind an End of Day index price. Using a price from any of these very reputable data providers
means that auditors would not likely flag Novera. It is not clear whether a data provider would be
willing to offer an index price more frequently right now. Novera is working with
mathematicians at Sigma to develop a more refined index. Currently these data providers do not
factor in bitcoin trades that are nominated in ethers, yet bitcoin/ether trades are about a third of

\begin{footnotes}
\footnote{32} Nominally, in the US, net worth over $1M ex of primary residence, or income in excess of $200,000.
shows-several-bitcoin-exchanges-are-engaging-in-volume-manipulation/).
\footnote{34} Taylor, D. H. 2018. “Bitcoin Arbitrage Between Exchanges Provides Profits - Bitcoin USD
(Cryptocurrency:BTC-USD),” Seeking Alpha. October 10. (https://seekingalpha.com/article/4210867-bitcoin-
arbitrage-exchanges-provides-profits).
\end{footnotes}
the volume of bitcoin/USD trades, so they should not be ignored. There is a widely used US dollar index, called the “Dixie,” and it does not factor in just USD to euros and ignore USD to yen. So, Sigma and Novera are using a technique called numeraire to factor in bitcoin trades nominated in ethers and other cryptocurrencies to get a fairer value for a bitcoin index price. Who knows? In a blockchain world, this could be a lightweight service that they together offer other firms on the blockchain.

As Novera and Sigma work towards launching the Long-Short funds, getting the fairest bitcoin price is just but one priority. The “devil is indeed in the details,” and they are finding that there are many things they need to collaborate upon. What happens when the investors want to take some of their money out of the Fund? How do they maintain equal amounts in the Long and Short funds then? How do they design and execute on operating procedures (to follow the flow in Figure 2)? Maybe the easy part has been done: The disruptee, Sigma, has matched with the disruptor, Novera. We, the documenters of this match, hope to document in the future whether this synergy was realized.

Conclusion
We presented the journey by which Novera Capital, the blockchain innovator, partnered with Sigma Analysis, an SME investment firm actively looking for opportunities to leverage disruptive technologies. What can the reader take-away from the documentation of this journey?

For any company, but especially for an SME…

- Blockchain may be disrupting your industry, and if you don’t pay attention, your business may be disrupted away
- Try to join a blockchain consortium in your industry
- Reach out to university researchers, technologists, and venture capitalists. See if there are government or industry programs that will help fund or other facilitate working with these experts
- Find a start-up who possesses blockchain expertise and explore partnerships, licensing agreements, joint ventures, taking equity positions in, and outright purchase
- It may be even be possible that with the right collaboration, you might pioneer blockchain use in your industry, and perhaps new business opportunities will be open to you.

A Corporate Ethos. In the halcyon days of cryptocurrencies and ICO’s, zealots called for the global financial system to be overhauled and completely decentralized. Investors complained when their cryptocurrencies didn’t double in a week, lamenting “when moon”? Yet many had no idea what they were investing in. So-called companies raised tens, even hundreds of millions of dollars in ICO’s, based on some mostly-formed ideas stapled together in a white paper that

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37 i.e. when is my cryptocurrency price going to the moon
were marketed on Youtube and Reddit. They wanted to replace Bay and Wall Streets using flimsy business models, hollow techno-speak, and unproven and insecure technology.

Against this backdrop, Bay and Wall Streets were suspicious of crypto people. Even though Novera was pitching a bitcoin tracking instrument, a Harvard law student (Shier), a New York hedge fund manager (Unger), and two business school professors (Laskowski and Kim) walking into a meeting sends the message that Novera is plenty corporate. And Novera endeavored to adhere to their corporate ethos.

Novera would be able to walk into any boardroom and clearly demonstrate compliance to regulations, and moreover show that their business practices would meet stringent expectations of large financial institutions.

We believe the lesson here is that in finance, which is heavily regulated and conservative, start-ups—whether they are espousing AI, blockchain, or Big Data—should show that they want to work with Bay and Wall Streets, not replace them. In this context, we do not believe “Move fast and break things”\(^\text{38}\) is appropriate.

**Regulators Support Innovation; They Support Blockchain.** We’ve already noted how knowledgeable and supportive the OSC was to Novera. A couple of years ago, blockchain.lab participated in the RegHack (Regulators Hack) blockchain hackathon sponsored by the OSC. Then OSC allowed the TokenFunder STO to take place under their watch through the OSC Launchpad program. A Sigma senior manager noted that Ontario was creating a regulatory arbitrage opportunity with STO’s. Like the US and many parts of Europe, Canadian regulators opine that most ICO’s are likely in violation of regulations. Yet, because the Launchpad was studying STO’s, the framework for that was being better refined in Ontario rather than other places where ICO’s are not allowed. It could be considered an arbitrage in that if an entrepreneur wanted to do a legal token offering at a place where there is ample transparency and well-respected rules of conduct, then Ontario turns out to be one the best places in the world.

The value of a regulators’ willingness to support blockchain innovation transcends finance. The factor most commonly cited by 39% of 1,000 executives as barrier to greater organizational investment into blockchain is regulatory issues. We see similar regulatory support for Ontario’s agriculture industry. We were involved in a provincial government project to study how to get dairy farmers—who are mostly effectively SME’s—to adopt, or at least be more education in, blockchain technologies.

We believe the lesson here is that large companies and SME, but most especially startups, should engage appropriate regulators in decisions about blockchain investments.

**From Heavyweight Intermediaries to Lightweight Blockchain Services.**

Comparing information flows for Long-Short Funds versus those for Long-Short Tokens, it is possible to see this. Long-Short Funds require Novera, Portfolio Manager (Sigma), Fund

\(^{38}\) Taplin, J. 2017. Move Fast and Break Things: How Facebook, Google, and Amazon Have Cornered Culture and What It Means for All of Us, Pan Macmillan.
Administrator as intermediaries. Long-Short Token on the blockchain actually require more intermediaries—Novera smart contract, KYC/AML service, Bitcoin pricing oracle, and an Auditing service. This shows that working with Bay and Wall Streets, rather than trying to replace them, entails not necessarily eliminating or decreasing the number of intermediaries, but rather making them more light in weight. If a heavyweight intermediary is unnecessarily human-based and expensive, then the work it previously did could be replaced by an interplay between a main smart contract and other lightweight services. The responsibilities of the Administrator can be parsed to work to be done by smart contracts of Novera and the regulators, as well as KYC/AML and bitcoin pricing services. The immutability, automation, and transparency qualities of the blockchain enable efficiency going from heavyweight to lightweight.

We believe that there are still great many possibilities for large companies, SME’s, and start-up’s to invest in blockchain technologies, and not just in finance. We hope that this paper provides a rough blueprint delivered by way of a detailed and insider-written case study to guide the motivated reader.