B.Sc. Essay in Business

Can Ripple disrupt the global payments market?

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Instructor: Guðrún Johnsen
Faculty of Business Administration June 2018

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Bachelor's of science essay for Faculty of Business Administration

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This is a bachelor's of science essay that counts for 6 ECT credits in the School of Social Sciences, Faculty of Business Administration, at the University of Iceland.

Preface

This is a Bachelor of Science essay that counts for 6 ECT credits in the School of Social Sciences, Faculty of Business Administration, at the University of Iceland. In recent months, digital currencies such as Bitcoin, Ethereum, and Ripple have gained significant media attention. After researching the subject and consulting with my supervisor Guðrún Johnsen, a lecturer at the School of Social Sciences, I chose to centre my essay on the company Ripple and its digital asset XRP. The objective of this inquiry was to explore how trade and currencies evolved into digital assets and how the technology behind these digital assets can revolutionise financial markets, particularly the massive market of cross-border transactions or global payments.

Summary

The goal of my essay was to explore blockchain or distributed ledger technologies like Ripple and to inquire into how such systems can potentially disrupt industries such as global payments. Ripple's distributed ledgers eliminate the need for back-office databases to be kept to complete cross-border payments, which saves significant money and time. Its digital asset XRP can handle the same throughput as VISA with its distributed ledger and offers a distributed technology where banks and financial institutions can send money on a distributed network between each other instead of the current centralised system which requires extensive use of intermediaries. The average cost for remittance payments is 7.1 per cent, and World Bank plans to lower it to 3 per cent by the year 2030. If Ripple is successful, it plans to lower remittance payments costs to 0.3 per cent.

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1   Introduction

Money is defined as any item – tangible or symbolic – that is accepted in the exchange of goods and services. The earliest monetary transactions consisted of people directly bartering for goods such as sheep and cows, which at the time were forms of money. However, bartering wasn't always an option since people frequently disagreed on what various goods were worth in these exchanges. Lack of consensus about the worth of one object relative to the worth of another created disagreements and made bartering unsustainable on a larger scale and in the long term. As a result, humans invented commodity money. Commodities were essential items that everyone had a use for, such as seeds and salt. But with commodities came new problems, as these goods were not always easy to transport and were prone to decay. (Burn-Callander, 2014)

Later, to simplify trade, coins were created using gold, silver, and copper. Each coin had a steady, set value, which facilitated more efficient trade. But due to the impracticality of carrying around coins, the next evolution was to representative money, where the money itself did not carry literal value, but rather held only symbolic value. Soon enough, every country had its own series of coins and paper money signifying a certain worth. Governments and central banks backed this representative money, which was valued according to the gold standard, i.e., the specific amount of gold (or silver) that a currency could be exchanged for. However, the problem with representative money was that its acceptance depended upon the reputation of the issuer and thus was still a less than ideal means of purchasing goods and services. (Burn-Callander, 2014)

Later still, fiat money was introduced as an alternative to commodity money and representative money. In the 20th-century, fiat money rose to power when President Nixon decoupled the US dollar from gold. Fiat money bears no intrinsic value; rather, governments use their power to set and enforce the value of the currency. Fiat money is essentially money as we know it today; a couple of paper bills in our pockets or a digital number in our bank account stating our wealth. (Bordo, 2008)

The trouble with fiat currency is that to date, everyone has encountered massive problems with devaluation, which has often led to a collapse of the coin. Historically, businesses and individuals have had to rely on intermediaries like banks and governments to ensure trust and certainty related to financial deposits, trades and withdrawals. The

need for intermediaries is especially acute when making digital transactions. (Lo & Wang, 2014)

2 Blockchain technology

Applications of blockchain can be both private and public; like the Internet, public blockchains are accessible by anyone. Blockchain has the potential to profoundly disrupt hundreds of industries that rely on intermediaries, and indeed, the technology is currently being tested in domains such as smart contracts, music distribution with proof of ownership for digital content and decentralisation of health records, as well as fraud-proof secure digital voting and cross-border transactions applications which include correspondent banking, business-to-business payments and peer-to-peer remittances. For these reasons, widespread adoption of blockchain will likely mean that many jobs will no longer exist and entire industries will be radically transformed. (Crosby et. al, 2015)

Banks and governments often impede the free flow of business because of the time it takes to process transactions due to regulatory requirements. Blockchain enables many more companies and individuals to trade much more frequently and efficiently, thereby significantly boosting local and international trade, especially in emerging markets. The blockchain technology also provides the means to eliminate expensive intermediary fees that have become a burden on individuals and businesses, especially in the remittance space. It seems backwards that nowadays it takes only an instant to message someone on the other side of the globe via the Internet, and yet it can still take up to a week and high fees to transfer money to other countries.

In the coming months and years, we may very well see huge disruptions of the financial industry, as blockchain applications such as XRP from Ripple promise to increase speed and transparency, and reduce costs for cross-border payments. (Defimedia, 2017)

3 The problem: global transfers

International transactions face many hurdles and delays because of country-specific regulations and currency differences. Exchanging one currency for another introduces a price and time variance that could impact pricing on each side of the exchange, which in turn erodes the stability and liquidity of the transaction, thereby increasing risk and cost. (Ripple, 2018a)

At present, most cross-border transactions occur via banks using SWIFT messages to send secure payment orders to foreign or receiving banks. Due to the liquidity issue, the originating bank sending the transaction must maintain a Nostro/Vostro account with a foreign bank for payments and local currency. (Seth, 2017)

Nostro refers to "our account on your books," and Vostro refers to "your account on our books." Funds in these accounts are used to hedge foreign exchange risk by settling international transactions. Maintaining account balances in local currencies improves liquidity by lowering the risk of the parties transacting. The largest commercial banks hold Nostro accounts all over the world in every currency so that they are able to facilitate global payments. The most easily convertible currencies are the U.S. dollar, the Euro, the Japanese Yen and the Great British Pound. Before the Euro was introduced in 1999, banks needed to keep Nostro accounts for all of the European countries that now use the Euro, but now only one Nostro account is needed (Amundsen, Belghazi, & Börestam, 2010)

However, because only the largest commercial banks can afford to hold these Nostro accounts, retail banks must use commercial banks as intermediaries in order to complete global payments. In a process known as Correspondent banking, smaller retail banks require commercial banks as intermediaries to send cross-border payments. (Park, 2006)

3.1 Inefficiency

In addition to the issue of smaller banks needing to use commercial banks as intermediaries, Nostro accounts also present a larger problem, namely that by holding these local currencies all around the world, trillions of dollars sit dormant at any given time, tying up capital which could be used in much more productive ways. The cost and complexity of holding these accounts is one reason that only a handful of the largest banks can process global transactions without the use of multiple intermediaries. The

burden of maintaining these Nostro accounts worldwide is simply unsustainable for most organisations. (Ripple, 2018a)

A study conducted by McKinsey revealed that it often takes several days for cross-border payments to settle. When sending these payments, each intermediary must confirm the transaction and vouch that the information is correct and all regulatory requirements are met. Every additional intermediary added to the process further prolongs the payment, and when intermediaries are in separate time zones, the delay increases. (Denecker, Istace, Masanam, & Niederkorn, 2016)
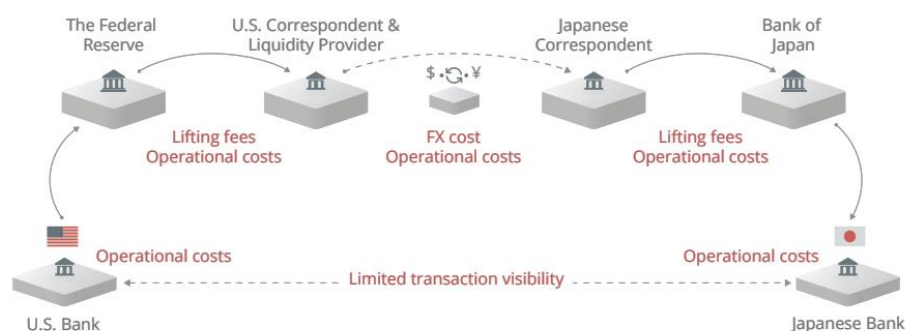
Picture 1: An example of how cross-border payments work today (Ripple, 2016a)

Indeed, when a retail bank wants to send money to a country that has a different currency, in which it does not have a Nostro account, that bank must navigate many intermediaries, ultimately resulting in increased fees that can quickly eat up large chunks of the original payment, see Picture 1. The global average cost of sending a cross-border transaction is 7.1 per cent, and in emerging markets the percentages are even higher. Clearly, low-fee international transactions are essentially non-existent and thus represent an unfilled need in the marketplace. (The World Bank, 2018) As will be discussed later in this paper, technologies like blockchain and specifically companies such as Ripple are well positioned to meet this growing need.

A large component of global payments is remittance payments, i.e., when a migrant worker who has temporarily relocated abroad sends funds back home. Transferring this money requires either going through banks or using financial firms like Western Union, Money Gram and RIA who account for 25 per cent of the world's annual remittance payments—a 500 billion dollar industry. (Harrigan & Seo, 2016)

4   A possible solution: Ripple

Scalability and performance are crucial components of digital assets that want to compete with fiat currency to be used for remittances and other payment systems. For a digital asset to successfully handle such transactions between financial institutions, it must be ready to settle transactions fast in order to challenge the likes of VISA, one of the most significant payment processing companies in the world. VISA currently handles around 2.000 to 4.000 transactions per second, with the ability to handle up to 24.000 transactions per second. (VISA, 2010)

The recent introduction of the Bitcoin appears to make possible conducting a digital transaction without a third party intermediary, and thus likely represents the next evolvement of the way we use money. Bitcoin first appeared in a 2008 white paper authored by the pseudonymous Satoshi Nakamoto, detailing an innovative peer-to-peer electronic cash system (Bitcoin) that enabled online payments to be transferred directly, without an intermediary. While the proposed Bitcoin payment system was exciting and innovative, what was truly revolutionary was the mechanics of how the system worked. Indeed, shortly after the white paper's release, it became evident that the outstanding technological innovation here was not the digital currency itself, but rather the technology that lay behind it, known today as blockchain. (Tapscott, 2016)

Three of the largest names currently in the digital asset market are Bitcoin, Ethereum and Ripple. Most holders of Bitcoin had visions of the digital asset being used for things like remittance payments, personal banking, online retail, digital purchases and ultimately a complete replacement for fiat money. But if Bitcoin were to attempt such a feat, the platform would collapse, as it is not built for this kind of use. We have already witnessed the impact of high traffic on Bitcoin, which often leads to an exponential price increase and delay in Bitcoin transfers. Accordingly, the outlook on Bitcoin has changed, and today it is considered an asset class comparable to bonds, equities or stocks. (Shin, 2016)

Ethereum is designed to create and run smart contracts, i.e., programmable applications that run as promised, without any downtime, censorship or interference. Ethereum can handle transactions faster than Bitcoin, but it is not applicable to payment

processing. Ripple is a blockchain payment system designed for banks and payment providers that is built to move large amounts of money more quickly and reliably. As such, it is perfectly suited to the payments market.
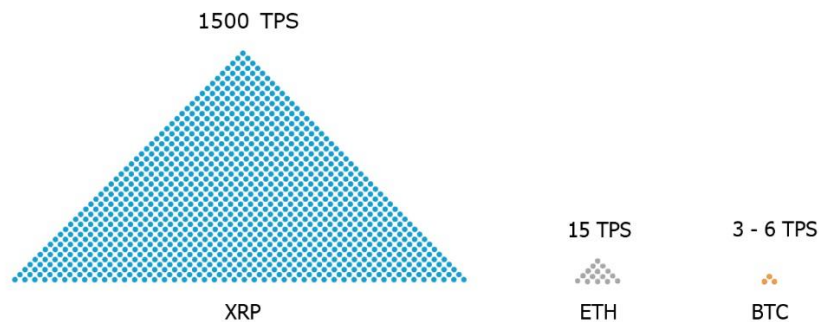
Picture 2: Comparing transaction speeds of the current three most substantial digital assets (Ripple, 2017a)

As shown in the comparison above, Bitcoin (BTC) handles 3-6 transactions per second and Ethereum (ETH) can handle 15 transactions per second. Ripple's digital asset (XRP) has been tested and proved that it can consistently handle 1.500 transactions per second and settle them within seconds. XRP is the only digital asset with a clear institutional use case designed to solve a multi-trillion dollar problem; the global payment and liquidity challenge that banks, payment providers and corporations face. (Ripple, 2017b)

XRP today consistently handles 1.500 transactions per second, and with the use of Ripple's XRP Ledger, it could reach 50.000 transactions per second, thereby putting it on par with Visa. Currently, these limits are only tested on the busiest days of the year. (VIas, 2017)

Picture 3: Comparing settlement of payments of the current three most substantial digital assets (Ripple, 2017a)

Ripple's XRP enables fully settled payments in four seconds. By comparison, traditional payment systems can take days. Using a digital asset as a bridge currency could potentially meet customers' demand for instant payments worldwide. Being the largest cryptocurrencies, Bitcoin and Ethereum are often cited as the frontrunners to fill this need; however, they are neither built for nor suitable to handle such a volume of transactions. (Ripple, 2017a)

4.1 Overview and development

Ripple was first introduced as OpenCoin. In 2002, Ryan Fugger presented the idea to create a person-to-person exchange of personal credits or IOU—an informal document that acknowledges a debt owed. Fugger worked on this non-profit project in his spare time, which eventually led to the creation of the first iteration of Ripple in 2004. The significance of this development was not fully understood at the time, but several years later, Jed McCaleb designed a currency system that differed from the competition. The idea was to build a more efficient consensus algorithm that didn't consume as much electricity as Bitcoin and other cryptocurrencies. (Ripple, 2018a) Bitcoin coins are created as rewards for participants offering computing power up to a fixed amount to maintain the blockchain, consuming a lot of energy in the process. (Zhao, 2018) In place of Bitcoin's proof-of-work, Ripple uses something called global consensus to verify trust. Global consensus leads to faster transaction times and lower transaction fees because verification of transactions can be done by members of the community, which brings us one step closer to creating a completely decentralised payment method. (Cohen, Schwartz, & Britto, 2015)

McCaleb, along with Chris Larsen, released the digital asset XRP and created the company Ripple. The company was then gifted a significant per cent of the digital asset XRP to maintain the growth of the company and digital asset. In addition to currently running its network independently, Ripple obtained a license for XRP to be deemed a virtual currency and is now a registered available service. They also built an open source protocol called the XRP Ledger, which is a public network with no central authority.

The XRP Ledger is a distributed payment protocol that can transfer anything of value, from fiat currency to digital assets and even frequent flyer points. Users can add

data to the distributed ledger, but nothing can be deleted, which essentially makes the ledger immutable and entirely transparent. The database is shared publically and operates as the first universal translator of money. Anyone can change currencies on the global protocol, and the trades are peer-to-peer, automatic and free of fees or margins. Brokers, middlemen or intermediaries are unnecessary since trades are processed automatically by the network. (Ripple, 2018b)

Regarding the impact of specific blockchain companies, few have done more for the global banking industry to date than Ripple, whose ultimate goal is to revolutionise payment systems with its platform. Ripple's idea is to reduce barriers to entry to enable global payment to become a genuinely worldwide activity. To support this mission, Ripple birthed RippleNet, the company's global payments system that creates a global network for banks and financial institutions in which people can send and receive payments via Ripple technology. This enables transaction processing which involves processing transactions one at a time, instead of the usual batch processing, which processes transactions in a group or batch. (Ripple, 2017c)

4.2 Specific products

RippleNet offers its customers a series of products, namely xCurrent, xRapid and xVia, each of which supports its mission to move money as seamlessly as information moves today.

xCurrent has a built-in messaging system where banks talk in real time to confirm payment details before initiating each transaction. In addition to its real-time messaging system, xCurrent also includes a settlement solution, which decreases the time it takes to settle payments from several days to an average of four seconds. And, with the use of Ripple's Interledger protocol, transactions can be completed even more quickly, making cross-border payments essentially instantaneous. What's more, xCurrent can be used to settle payments without intermediaries, but is still settled through a Nostro account. There are currently over 100 financial institutions and payment providers that have partnered with Ripple to use xCurrent, approximately half of which are banks.
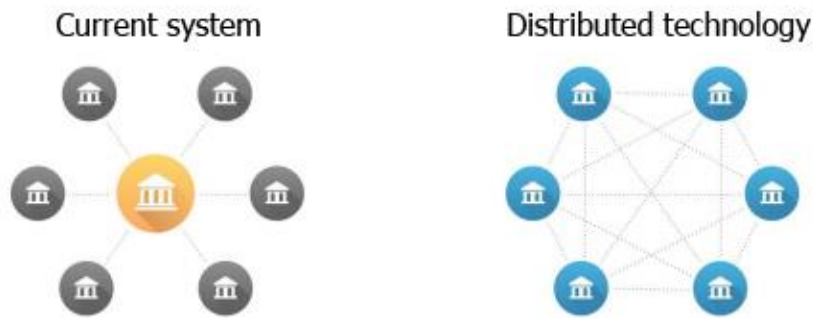
Picture 4: Ripple uses distributed technology to eliminate intermediaries (Ripple, 2017a)

Once RippleNet's xCurrent has been integrated, users will have the option of using xRapid, which utilises Ripple's digital asset XRP. Designed for payment providers and other financial institutions that wish to minimise their liquidity expenses and improve customer experience, xRapid dramatically lowers capital requirements for liquidity and uses XRP to settle payments, which allows for real-time payments in emerging markets. Further, xRapid satisfies regulatory requirements by providing pre-disclosure of fees and rates before the transaction is initiated in order to promote complete transparency of settlement. Built for enterprise use, XRP gives banks and payment providers a highly efficient, scalable, reliable liquidity option to service cross-border payments. (Ripple, 2017d)

Thirdly, xVia is designed for corporations, banks and payment providers who want so send multiple payments across various networks using a simple interface. The product enables users to seamlessly send payments globally with complete transparency and includes key information such as invoices. Today, xVia appeals to large corporations who send thousands of payments all over the world daily. (Ripple, 2015)

Ripple's primary customers are banks, payment providers, digital asset exchanges and other financial institutions. Currently, Ripple has over a hundred partners in the financial market using xCurrent, the most notable companies are The Bank of England, BBVA and Santander Bank which is one of the largest banks in the world and was ranked 37th biggest corporation in the world. (Forbes, 2009) Two of the largest remittance transfer companies in the world, MoneyGram and Western Union, are piloting xRapid. (Marquer, 2017)

Other notable names piloting xRapid are Cuallix, IDT Corporation and Mercury FX, all of whom operate in emerging corridors, where liquidity costs are high. (Ripple, 2018c)

5 Incentive to Adopt New Technology

For a business to improve its processes, it must remain ahead of the curve and successfully exploit new ideas. Prosperous businesses succeed in bringing new and improved products and services to market to increase efficiency and profitability. The current global payments market suffers from inherent problems, such as the unsustainable cost associated with funding positions around the world in order to service cross-border transactions, which means that most financial institutions must rely on middlemen – major commercial banks – to mediate such transactions. When several intermediaries route the payments, the potential points of failure increase, which in turn results in frequent errors, unpredictable processing times and uncertainty regarding the delivery of funds.

Furthermore, individual transactions are plagued by lack of visibility, and they can take up to a week to process. Each time a transaction goes through an intermediary, it requires the receiving bank to be "online." With so many intermediaries situated in different time zones, transactions take that much longer to settle. As a result, banks absorb significant costs related to payment processing, liquidity, operational costs and compliance.

In 2016, Ripple responded to the insufficiency of the current financial situation by releasing a cost-cutting case for banks and financial institutions, in which Ripple calculated the expected return on investment when using the company's product compared to the current system
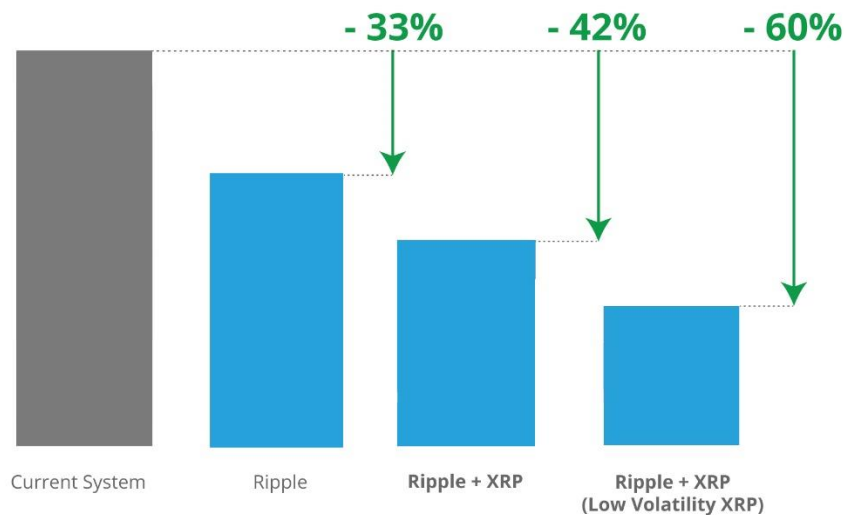
Picture 5: Comparison of cost savings implementing Ripples solutions compared to the current system (Ripple, 2016a)

Using Ripple's xCurrent, customers can more efficiently exchange information regarding the sender, receiver, fees, rates, delivery estimate and payment status, which ultimately lowers their operational cost of processing international payments. Though xCurrent still uses Nostro accounts for the settlement, transactions no longer require any intermediaries. Ripple's product also increases processing rates and eliminates Swift fees. Lowering in-flight capital requirements, liquidity costs, counterparty risk and compliance costs causes treasury operation costs to decrease, while providing instant confirmation and real-time liquidity monitoring reduces reconciliation costs.

When xRapid, which utilises XRP, is integrated, not only will payments be settled in seconds, but the whole settlement will only take seconds. The actual payment, rather than a credit or debit, will land at its intended destination fully intact. XRP provides an on-demand liquidity solution that eliminates the need for Nostro accounts, allowing banks and financial institutions to put previously idle money to better use. (Ripple, 2017e) Payment providers and other financial institutions can swap assets in and out of XRP in order to move them through Ripple's xCurrent payment protocol faster. (Ripple, 2016a)
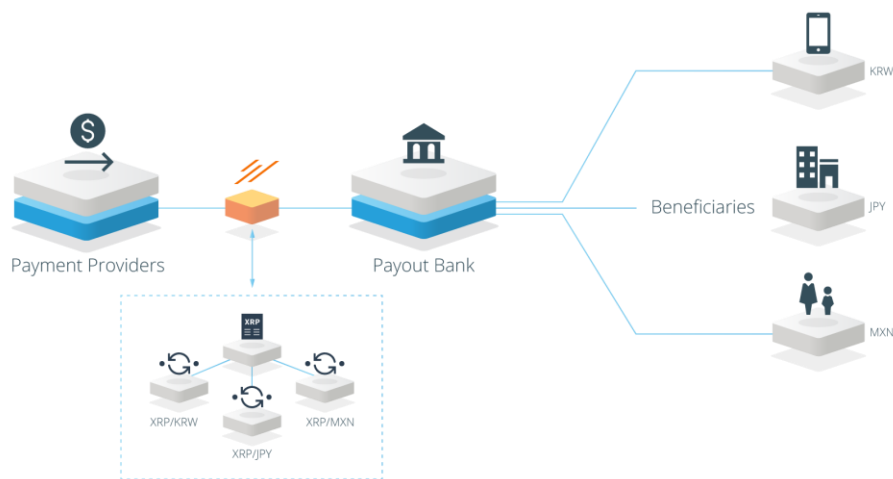
Picture 6: How XRP is used as a bridge currency, whether for trades or cross-currency payments. (Ripple, 2017d)

World Bank's goal is to lower the cost of remittance payments from the global average of 7.1 per cent to 3 per cent by 2030. (United Nations, 2018) If Ripple is successful with its adoption, it plans to drop remittance payments to 0.3percent. (Cate, 2018)

6   Barriers to adoption

High volatility in the cryptocurrency market has made financial institutions sceptical about accepting and integrating digital assets and cryptocurrencies and remains the largest barrier to mainstream adoption. The volatility of cryptocurrencies stems from the coins having no intrinsic value and the absence of rules and regulations on the market.

Picture 7: Market size of cryptocurrencies in 2017 (CoinMarketCap, 2018a)

With the market cap going from 15 billion dollars to 600 billion dollars by year's end, it's safe to say 2017 was spectacular for the cryptocurrency market. On the graph above, the

massive market fluctuation is what mostly draws the eye. Whereas in the conventional stock market changes like these occur in response to particularly large announcements or major scandals, in the cryptocurrency market space such fluctuation is normal.

6.1 Price

Picture 8: Ripples XRP price in 2017 (CoinMarketCap, 2018b)

The year 2017 was an absurd one for Ripple's XRP, which increased tens of thousands of percentages. The price went from $0,0065 to $2,5 per coin.

When XRP was over $2,5 per coin at the beginning of 2018, Chris Larsen, Ripple's co-founder and former CEO, was among the richest people in the world due to his shares of XRP and equity in the company, which helps to put the size of the cryptocurrency market into perspective. Further, if XRP has a higher value, it increases the value of the solution because it increases liquidity on the network. With a higher value, XRP can convey a higher value than other currencies. (Hamilton, 2018)

6.2 Regulation

Most cryptocurrency investors and inventors don't want their market to be regulated. Ripple has a different view on the subject, arguing that it is incredibly important for the industry to understand that blockchain adoption can only happen from within the system, not outside of it. For this reason, Ripple is open to working with regulators and the system as it currently exists, and to attempt to integrate new technology into the system as it already exists, thereby transforming it from the inside. Indeed, Ripple plans to work with banks and financial institutions in the current system and believes that rules and

regulations will increase the stability of the market and thus lower Ripple's XRP liquidity costs. (PYMNTS, 2018)

The European Commission recently argued in favour of further regulation of digital assets within the Union, including investor protection, market integrity and financial stability for users in the cryptocurrency market. (European Commission, 2018)

On March 20. 2018, at a meeting of The Financial Stability Board (FSB), i.e., the collective that organises financial regulation for Group of 20 Economies (G20), the Board rejected calls to regulate cryptocurrencies and digital assets. The FSB estimated that despite the massive growth of cryptocurrencies and digital assets in 2017, these do not currently pose any risk to global financial stability. (Jones, 2018)

6.3   Market competition

Forty years ago, 239 banks from 15 countries united in order to solve their common problem of communication in cross-border payments. These banks formed the Society for Worldwide Interbank Financial Telecommunications, commonly known as SWIFT, whose messaging service went live in 1977 and has been prevalent ever since. SWIFT is considered to have a monopoly on cross-border payments messaging systems, with around 11.000 banks currently using the SWIFT network. (SWIFT, 2016a)

The rapid technological advancements in the financial industry haven't gone unnoticed by SWIFT, which in spring 2016 released a paper highlighting the opportunities and challenges of distributed ledger technology in financial services. In it, SWIFT praised the technology and talked about how a fast, standards-based, blockchain oriented solution could remodel the payment process. They also addressed the challenges blockchain would need to overcome, such as regulatory compliance, strong governance, cybersecurity, reliability and scalability. (SWIFT, 2016b)

SWIFT then began working on its own distributed ledger called Hyperledger Fabric. With over 34 banks participating the initiative, this was one of the most extensive blockchain proofs of concept implementations executed in the industry to date, as far as participant engagement and scale of infrastructure are concerned. Results were very positive, but also revealed that further progress was needed to the Hyperledger technology, which was not yet ready to support applications in large-scale global

infrastructure. SWIFT was clear in its findings that it believed distributed ledgers would be implemented, but whether such ledgers would be offered by SWIFT or by a third party remained unknown.

Recently SWIFT announced that they would no longer focus on their ledger solution, and will focus instead on their largest overhaul in decades, which is called SWIFT GPI. With the objective of delivering a resilient, compliant and secure customer experience, SWIFT GPI seeks to lift some of the pressure currently on the traditional correspondent banking model. Updating their current infrastructure has enabled SWIFT to offer a same-day settlement for their customers, and the information system has been enhanced to allow sending 140 characters. (SWIFT, 2018)

6.4   Banks stuck in status quo

Banks and financial institutions are usually very sceptical when new innovative technology is introduced. But eventually, banks will have no choice but to respond to customer demands by accepting these new products. It is after all the customer, not the bank itself that ultimately matters in creating demand for new and innovative products. As the pressure to adopt an alternative solution to transferring money continues to build, banks and financial institutions will need to succumb to new technology in the near future.

Among the requirements for modernised global payments are transparency, predictability, ability to send payment instantaneously and generally low-fee payments. Regulations including PSD2 require pre-disclosure of fees and FX rates, which is simply not possible with our current payment infrastructure. However, Ripple helps banks satisfy regulatory requirements by providing pre-disclosure of fees and FX rates before the transaction is initiated, which promotes complete transparency of the settlement.

Furthermore, settlement errors still occur within the current system which is due to limited visibility. If the process fails at any point, it is hard to pinpoint where the failure occurred, which in turn leads to unwanted delays. International payments take an average of 3-5 days to settle, while the latest industry initiative from SWIFT GPI promises same-day settlement. Although SWIFT GPI represents a great improvement to the current model, Ripple's distributed technology is a cut above the rest, offering settlement of

funds instantly and eliminating any risk of it failing since the entire payment must succeed before the transaction can be completed. In short, sending a low-fee payment worldwide without steep fees is made possible via Ripple. (Ripple, 2016b)

Because of customers' demands for faster, better and cheaper solutions, many payment processing companies have emerged that bypass traditional banks. MoneyGram and Western Union, who are among the largest payment processing companies, announced in 2018 that they are currently testing RippleNet solutions, including both xCurrent and xRapid. When questioned about the partnership, Western Union CEO Hikmet Ersek discussed the possibilities of working capital optimisation, which is related to xRapid eliminating the need for Nostro accounts holding dormant capital. (Roberts, 2018) Similarly, Moneygram CEO Alexander Holmes praised Ripple for being at the forefront of blockchain technology and said their goal is to increase efficiency and improve services for their customers with the integration. (MoneyGram, 2018)

By contrast, Skandinavska Enskilda Banken or SEB was one of the first banks to sign up for SWIFT's innovation initiative. Although SWIFT's advantage was obvious with an established network of banks, SEB complained about how cumbersome and complex the system was. Since SWIFT's solution is done bank to bank, it requires significant effort to be implemented. Later, SEB partnered with Ripple and praised the technology for being very easy and quick to implement and championed the platform's full transparency and immediate transfer of value. (Ku, 2018)

6.5 Challenges

Ripple holds more than 60 billion XRP coins and has distributed 39 billion XRP coins to the community—a distribution model chosen in order to attract top-quality talent and investment. This strategy has since been heavily criticised, since many bemoan the inequality and greed that mar the current financial system. In order to mitigate pushback, Ripple has escrowed a large portion of their holdings. Indeed, in December 2017 Ripple locked 55 billion XRP into a series of escrows, with one billion XRP being released every month for the next 55 months. Escrowing more than half of all XRPs assures investors that Ripple won't flood the market with the coin upheaving the supply and causing a price crash. (Ripple, 2017f) Being a business-friendly company that complies with regulation

and aims for widespread adoption in daily commerce, one of its greatest challenges is integration into a market where corporations are stuck in status quo.

Another challenge for Ripple is that the main selling point of XRP is that it will become a bridge currency for financial institutions to settle cross-border payments—but Ripple's payment network doesn't need XRP to work, and almost all partnerships to date have chosen to settle the payments later using fiat currency. XRP operates in a very volatile space making it a hard sell, which could possibly be amended with rules and regulations, but the problem is most cryptocurrencies don't want to be regulated. (Buterin, 2013)

7   Conclusion

Money evolved from barter to commodity money in order to more efficiently complete trades. Later came coins, fiat money and digital fiat currency, each of which facilitated money advancement even further. Today, most financial institutions are moving towards adopting blockchain applications because of the low-cost, instantaneous international transfers the technology can offer.

Distributed ledger or blockchain technology has already impacted most financial institutions, including those operating in payment and settlement, with its promise of improved efficiency and higher resiliency. In the past, reconciliation of information proved very time consuming and expensive because it involves storing of information of different formats in different ledger. Now, distributed ledgers allow internal records related to transactions to be shared across all relevant parties in a common format, which reduces data disparity, eliminates or reduces back-office work and facilitates quicker reconciliations. Near real-time transfers made possible by some distributed ledgers will also allow funds to be received more quickly, thus freeing up liquidity that would otherwise have been tied up in collateral. Most cross-border transactions are done using SWIFT messages to send secure payment orders and often involve multiple intermediaries, all of which require fees for their service. Due to country-specific regulations and currencies, hurdles and delays frequently arise. Banks must keep local Nostro accounts in every currency to improve liquidity and

lower the risk of parties transacting, which means that trillions of dollars sit dormant around the world, thus tying up capital that could be used more productively. Cross-border transactions are costly and take three to five days to settle. In response to these difficulties, SWIFT, the most significant cross-border payments messaging network, has very recently introduced GPI, which promises same-day settlement and reduced fees. However, this technology met lukewarm reception by early testers such as SEB.

Given these predicaments, xCurrent and Ripple's distributed technology could remove the need for intermediaries and enable customers to send payments in seconds, for only a fraction of a penny. With the integration of xRapid using XRP providing on-demand liquidity, we could remove the need for holding Nostro accounts all over the world, freeing up trillions of dollars of "dead" money.

For such a platform to work, all participants would need to adopt RippleNet. If a digital asset wishes to compete with fiat currency to be used for payments, it faces the issue of scalability, and it needs to be able to handle thousands of transactions per second. Ripple's XRP can process 1.500 transactions per second and can scale to operate the same throughput as VISA with the use of XRP Ledger. The largest barrier to adoption that digital assets face is volatility; this stems from the assets having no intrinsic value and the absence of rules and regulations. With a more stable market, XRPs liquidity costs and risks would be lower which would increase its efficiency. With over a hundred confirmed partnerships, Ripple has already made its mark on the global payments market. Despite not being comparable to a network like SWIFT, which boasts over 11.000 banks, Ripple has already improved the global payments market simply by its existence. Offering its distributed ledger technology solution has coerced SWIFT, the most extensive network of global payments systems, to introduce its most substantial overhaul in decades, providing value for everyone willing to accept their new system. SWIFT had plans of releasing their own distributed ledger, called Hyperledger Fabric, but the ledger was deemed not ready to support applications in large-scale global infrastructure.

SWIFT's network includes a messaging system adopted on a global scale, but it does not settle or make any payments the way that Ripple does, thereby making the two companies very different. For this reason, SWIFT and Ripple could easily exist in the same space, even with SWIFT making use of Ripple's distributed ledger technology.

The World Bank's goal is to lower the cost of remittances from 7 per cent to 3 per cent by 2030. Ripple already has leading companies in the remittance payment market using or trialling its product, including MoneyGram and Western Union. If Ripple is successful, they will make the World Bank's goal of lowering remittance cost seem modest, as Ripple plans to drop remittance payments to 0.3 per cent.

Ripple has already become one of the most significant names in the remittance payment industry by positioning itself as a neutral third party to handle plumbing of payments, but whether Ripple will gain as much traction in the banking industry remains to be seen. Clearly, payment processing companies and banks have strong incentives to implement distributed ledger solutions like those that Ripple offers, so it's likely that the coming months and years will see rapid growth of this crucial technology.

References

Amundsen, E., Belghazi, S., & Börestam, A. (2010, Sep). *European Central Bank, p. 38.* Retrieved March 29th, 2018, from Ecb Europa Eu: https://www.ecb.europa.eu/pub/pdf/other/paymentsystem201009en.pdf

Bordo, M. D. (2008, Oct). *Library of Economics and Liberty*. Retrieved March 3rd, 2018, from http://www.econlib.org/library/Enc/GoldStandard.html

Burn-Callander, R. (2014, Oct). *The Telegraph*. Retrieved March 3rd, 2018, from https://www.telegraph.co.uk/finance/businessclub/money/11174013/The-history-of-money-from-barter-to-bitcoin.html

Buterin, V. (2013, Sep). *Bitcoin Magazine*. Retrieved April 14th, 2018, from https://bitcoinmagazine.com/articles/ripple-is-officially-open-source-1380246874/

Cate, R. (2018, Mar). *Ripple*. Retrieved April 14th, 2018, from https://ripple.com/insights/ripple-ceo-money20-20-asia-new-payments-system-digital-age/

Cohen, D., Schwartz, D., & Britto, A. (2015, Jan). *Ripple*. Retrieved April 7th, 2018, from https://ripple.com/build/xrp-ledger-consensus-process/

CoinMarketCap. (2018a, Apr). *CoinMarketCap*. Retrieved April 20th, 2018, from https://coinmarketcap.com/charts/

CoinMarketCap. (2018b, Apr). *CoinMarketCap*. Retrieved April 20th, 2018, from https://coinmarketcap.com/currencies/ripple/

Crosby, M. (2015, Oct). *Berkeley, pp. 3-4.* Retrieved March 4th, 2018, from www.berkeley.edu: http://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf

Defimedia. (2017, Jul). *Defimedia*. Retrieved March 30th, 2018

Denecker, O., Istace, F., Masanam, P. K., & Niederkorn, M. (2016, Jun). *McKinsey, pp. 4-5.* Retrieved April 8th, 2018, from McKinsey & Company: https://www.mckinsey.com/~/media/McKinsey/Industries/Financial%20Services/Our%20Insights/Rethinking%20correspondent%20banking/Rethinking-correspondent-banking.ashx

European Commission. (2018, Feb). *European Commission*. Retrieved March 24th, 2018, from https://ec.europa.eu/commission/news/roundtable-cryptocurrencies-2018-feb-26_en

Forbes. (2009, Apr). *Forbes*. Retrieved May 5th, 2018, from https://www.forbes.com/global2000/list/#tab:overall

Hamilton, M. (2018, Jan). *Quernus*. Retrieved April 14th, 2018, from https://www.quernus.co.uk/2018/01/14/currency-exchange-on-ripple/

Harrigan, F., & Seo, S.-M. (2016, Jan). *United Nations*. Retrieved April 14th, 2018, from un.org: https://www.un.org/sustainabledevelopment/blog/2016/01/244-million-international-migrants-living-abroad-worldwide-new-un-statistics-reveal/

Jones, H. (2018, Mar). *Reuters*. Retrieved April 8th, 2018, from https://uk.reuters.com/article/us-g20-regulations-carney/g20-watchdog-focuses-on-rules-review-holds-fire-on-cryptocurrencies-idUKKBN1GU0SF

Ku, L. (2018, Feb). *Corporate Treasurer*. Retrieved April 15th, 2018, from https://www.thecorporatetreasurer.com/article/two-days-to-two-seconds-how-seb-slashed-payment-times-by-ditching-swift-for-ripp/442850

Lo, S., & Wang, J. C. (2014, Sep). *Bahler.* Retrieved March 30th, 2018, from Federal Reserve Bank of Boston: http://bahler.co/wp-content/uploads/2016/11/Bitcoin-as-Money-Fed-Res.pdf

Marquer, S. (2017, Oct). *Ripple*. Retrieved March 31st, 2018, from https://ripple.com/ripple_press/ripples-blockchain-network-now-100-strong/

MoneyGram. (2018, Jan). *MoneyGram*. Retrieved April 7th, 2018, from http://ir.moneygram.com/releasedetail.cfm?releaseid=1054088

Park, Y. S. (2006, Nov). *VISA Commercial.* Retrieved March 24th, 2018, from Euro ecom cmu: http://euro.ecom.cmu.edu/resources/elibrary/epay/crossborder.pdf

PYMNTS. (2018, Mar). *PYMNTS*. Retrieved April 8th, 2018, from https://www.pymnts.com/news/regulation/2018/ripple-regulators-cryptocurrencies-xrp-brad-garlinghouse/

Ripple. (2015, Oct). *Ripple*. Retrieved March 29th, 2018, from https://ripple.com/solutions/

Ripple. (2016a, Feb). *Ripple.* Retrieved March 30th, 2018, from https://ripple.com/files/xrp_cost_model_paper.pdf

Ripple. (2016b, Jun). *Ripple.* Retrieved April 7th, 2018, from https://ripple.com/files/blockchain_checklist.pdf

Ripple. (2017a, May). *Ripple*. Retrieved March 4th, 2018, from https://ripple.com/xrp/

Ripple. (2017b, Dec). *Ripple*. Retrieved March 29th, 2018, from https://ripple.com/xrp/xrp-stacks-digital-assets/

Ripple. (2017c, Nov). *Ripple*. Retrieved 30th March, from https://ripple.com/kr/build/transactions/

Ripple. (2017d, Jul). *Ripple*. Retrieved March 29th, 2018, from https://ripple.com/solutions/source-liquidity/

Ripple. (2017e, Aug). *Ripple.* Retrieved March 29th, 2018, from https://ripple.com/files/ripple_solutions_overview.pdf

Ripple. (2017f, Mar). Retrieved May 6th, 2018, from https://ripple.com/xrp/market-performance/

Ripple. (2018a, Mar). *Ripple*. Retrieved Mar 30th, 2018, from https://ripple.com/insights/liquidity-explained/

Ripple. (2018a, Mar). *Ripple and XRP - Part 1: How Ripple Got Started*. Retrieved March 29th, 2018, from Youtube: https://www.youtube.com/watch?v=3zW_DN9pkbM&t

Ripple. (2018b, Mar). *Ripple*. Retrieved March 31st, 2018, from https://ripple.com/build/xrp-ledger-introduction/

Ripple. (2018c, Jan). *Ripple*. Retrieved May 5th, 2018, from https://ripple.com/insights/more-global-payment-providers-idt-and-mercuryfx-sign-up-to-use-xrp/

Roberts, J. J. (2018, Feb). *Fortune*. Retrieved April 7th, 2018, from http://fortune.com/2018/02/14/ripple-xrp-western-union-money-transfers/

Seth, S. (2017, Sep). Retrieved March 4th, 2018, from Investopedia: https://www.investopedia.com/articles/personal-finance/050515/how-swift-system-works.asp

Shin, L. (2016, Jun). *Forbes*. Retrieved March 30th, 2018, from https://www.forbes.com/sites/laurashin/2016/06/02/4-reasons-why-bitcoin-represents-a-new-asset-class/#37ec333a3426

SWIFT. (2016a, Jan). *Swift*. Retrieved April 15th, 2018, from https://www.swift.com/about-us/history

SWIFT. (2016b, Sep). *Swift*. Retrieved April 8th, 2018, from https://www.swift.com/insights/press-releases/swift-examines-application-of-financial-business-standards-to-distributed-ledger-technology-and-smart-contracts

SWIFT. (2018, Mar). *Swift*. Retrieved March 31st, 2018, from https://www.swift.com/news-events/news/swift-completes-landmark-dlt-proof-of-concept

Tapscott, D. (2016, May). *Time*. Retrieved March 4th, 2018, from http://time.com/4320254/blockchain-tech-behind-bitcoin/

The World Bank. (2018, Mar). *World Bank Group, p. 1.* Retrieved April 6th, 2018, from Remittanceprices Worldbank: https://remittanceprices.worldbank.org/sites/default/files/rpw_report_march2018.pdf

United Nations. (2018, Feb). *United Nations.* Retrieved April 6th, 2018, from https://unstats.un.org/sdgs/metadata/

VIas, M. (2017, Mar). *Ripple*. Retrieved April 7th, 2018, from https://ripple.com/insights/ripple-continues-to-bring-internet-of-value-to-life-new-features-increase-transaction-throughput-to-same-level-as-visa/

VISA. (2010, Aug). *Visa*. Retrieved March 24th, 2018, from visa.co.in: https://usa.visa.com/run-your-business/small-business-tools/retail.html

Zhao, H. (2018, Feb). *CNBC*. Retrieved May 5th, 2018, from https://www.cnbc.com/2018/02/23/bitcoin-blockchain-consumes-a-lot-of-energy-engineers-changing-that.html