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Revolutionizing International Remittance Payments Using Cryptocurrency and Blockchain-based Technology

Amine Soufaih
University of Pennsylvania

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Abstract

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Keywords

Blockchain, cryptocurrency, remittance, financial services, money transfer, fintech

Disciplines

Business | Engineering

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Disciplines

Blockchain Technology | Finance | Entrepreneurship | Technology & Innovation | Remittance Industry | Financial Technology | Cross Border Payment | International Economics | Banking

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Amine Soufaih (W'21, ENG'21)
Professor Gad Allon
The Wharton School

ABSTRACT

Blockchain is disrupting many traditional industries including financial services. In the case of remittance payments, blockchain is seen as a promising technology that can revolutionize the way we send and receive money. Traditional players like Western Union and Moneygram are facing new entrants in this market such as blockchain startups. This paper will analyze the application of blockchain in remittances in order to determine if it has the potential to transform this industry. Through our analysis of the remittance industry and its current competitive landscape, it seems that it is very likely that blockchain will disrupt the space and completely change it in the next few years. Some of blockchain's benefits in remittances discussed in this paper consist of reduced costs, increased speed, and the possibility to offer remittance services for the unbanked population.

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I. INTRODUCTION TO THE RESEARCH TOPIC

1. Overview of the Topic

Blockchain has made headlines in the past decade for its ability to revolutionize different industries especially financial services. From Asset Management to Lending, it truly has the power to disrupt traditional finance players and capture market share. Remittance is one industry that seems to check all the boxes for ideal blockchain implementation. In fact, even large remittance corporations such as Western Union have recognized that blockchain adoption is key to remain competitive in the near future. In this paper, we'll go in-depth into the challenges that the remittance industry faces and how they could translate to opportunities for blockchain innovation.

The goals and objectives of this paper are to get a good grasp of the areas where blockchain can be applied within remittances. While there is a clear match between the two, it is important to figure out the details of the benefits linked to blockchain adoption. Some of these details are not necessarily intuitive and might require an elaborate understanding of the different stakeholders involved in the remittance payment process. Another goal is to look into the startup landscape focused on the remittance industry and discuss how their work relates to the overall topic of this paper. While most startups are still in their early stages, others have already launched their products and are trying to acquire more customers. A final objective would be to recognize the challenges that blockchain will face in the development of remittance solutions. Understanding these issues is an important step towards ensuring successful implementation.

2. General Outline and Direction

The general outline that will be followed in this paper starts with an introduction to blockchain, its application in financial services as well as its potential risks and limitations. It will be followed by an overview of the remittance industry and deep dive into the different market players in the industry. We will look closer into the African and European markets representing the receiving and sending sides respectively, with Morocco and France as case studies. Finally, the paper will tackle the specific ways through which blockchain improves the cross-border remittance payment process.

II. BLOCKCHAIN TECHNOLOGY

1. History and Background

Blockchain is a distributed ledger technology that records transactions through a shared database among a network of computers. This revolutionary technology has shaken many industries through its innovative and disruptive nature. While Bitcoin is the first major application of blockchain, the origin of this technology dates back to David Chaum's blockchain-like protocol proposed in the 1980s .[1] Further progress in cryptography was made by scientists Stuart Habert and W. Scott Stornetta in 1991 who worked on a secured solution for time-stamping documents.[2] Despite the different experiments and technological advances made in the late 1990s and early 2000s, blockchain was mainly unheard of. The first practical and well-known application was introduced in 2008 by pseudonymous person Satoshi Nakamoto as Bitcoin. A Peer-to-Peer Electronic Cash System, Bitcoin became famous as the first cryptocurrency based on blockchain catching the interest of the public. 12 years later, Bitcoin has been transacted by millions of people around the world and has exceeded a market cap of $200Bn.[3]

After Bitcoin, new innovations emerged to tackle potential solutions related to the blockchain system. "Smart contracts" were introduced by Ethereum which allowed for an array of applications beyond the cryptocurrency and cash-like aspects provided by Bitcoin. Likewise, Ethereum and smart contracts have been highly successful over time and acquired millions of users. As an effort to transition from blockchain's computationally-heavy protocol, many developers have worked on moving from Proof of Work to Proof of Stake.[4] While the Proof of Work concept relies on creating blocks through power-consuming computer calculation known as "mining", Proof of Stake achieves the same goal but using a different process that depends on a person's wealth or stake.

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[1] A. T. Sherman, F. Javani, H. Zhang and E. Golaszewski, "On the Origins and Variations of Blockchain Technologies," in IEEE Security & Privacy, vol. 17, no. 1, pp. 72-77, Jan.-Feb. 2019
[2] Binance Academy. "History of Blockchain." Binance Academy, Binance Academy, 19 Jan. 2020.
[3] "Bitcoin Price, Charts, Market Cap, and Other Metrics." CoinMarketCap, Sept. 2020
[4] Marr, Bernard. "A Very Brief History Of Blockchain Technology Everyone Should Read." Forbes, Forbes Magazine, 20 Mar. 2018.

One of the major issues that the new generation of blockchain solutions are trying to solve is scaling.[5] In fact, the current blockchain process is slow because it relies on every node in the network to validate each and every transaction. Bitcoin's transactions, for example, have a limited processing rate due to their blocks' small size. The average time to create a bitcoin block is 10 minutes and each block's size doesn't exceed 1 megabyte.[6] Due to the technical constraints of bitcoin's protocol, large scale applications are very limited and in some cases virtually impossible. In order to compete with major banking and money transfer players, blockchain developers need to build systems that can seamlessly process millions of transactions at scale.

2. Uses of Blockchain in Fintech and Financial Services

While Blockchain has many applications across different industries, its main use case is in fintech and financial services. Through cryptocurrencies, blockchains can be used as digital financial instruments to facilitate transactions and money transfer. In fact, they offer several attractive features and benefits that outperform traditional finance such as programmable capabilities, greater customization, authenticity, and traceability, etc. Most startups and organizations have focused on building fintech solutions given blockchain's compatibility with financial systems. Some common applications include facilitating cross border transactions, credit scoring and reporting, and identity verification.[7] In a simplified way, blockchain allows the recording of financial transactions through a distributed ledger which is immutable and secure. Many areas of financial services have been seduced by these blockchain's features including fields such as Capital Markets, Asset Management, Remittances, Trade Finance, Lending, etc.[8] In this paper, we will delve deeper into Remittances and try to analyze how blockchain can be applied to solve issues affecting this space.

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[5] Gupta, Vinay. "A Brief History of Blockchain." *Harvard Business Review*, 21 Aug. 2019.
[6] Antonopoulos, Andreas M. "Mastering Bitcoin. Unlocking Digital Crypto-Currencies." O'Reilly Media, Apr. 2014.
[7] "5 Common Blockchain Applications in Financial Services." *Hydrogen*, 13 Dec. 2019.
[8] "Blockchain in Finance & Fintech: The Future of Financial Services." *ConsenSys*.

3. Future Growth Potential

Since Blockchain is a relatively nascent and evolving technology, it has immense future growth potential. As the technology gets more advanced, we will see high demand for blockchain solutions in different fields. According to a PwC report on Global Fintech, 77% of financial institutions expect to use or experiment blockchain in their production system by 2020.[9] In addition, investing in blockchain startups has been increasing lately, exceeding over a billion in the past 5 years. In 2019, the top 13 blockchain startups received $365 million in funding in 2019 alone.[10] A lot of this funding will be used to invest in R&D and operations which will propel blockchain's growth in the next few years. Potential breakthroughs could be the issuance of a national cryptocurrency or government recognition of certain digital instruments.

4. Potential Risks and Limitations

While Blockchain offers many opportunities for growth, it still lacks in many areas and suffers from serious technical and non-technical limitations. Some issues and ethical dilemmas facing blockchain are scalability, regulation, and energy consumption. Firstly, most blockchain applications haven't been deployed at scale due to many technical limitations. While Bitcoin had reached a peak of over 420,000 transactions per day by the end of 2017, that is still way far behind what most banking institutions process every day.[11] More effort needs to be done in order to scale blockchain systems and compete against payment giants like VISA which can process up to 47,000 transactions every second. [12] Secondly, regulations around blockchain have failed to keep up with its current technological progress which creates a risky environment.[13] Due to concerns around and user anonymity, policies in many countries have restrained blockchain's potential. There can only be tangible growth if supportive regulations and policies are put in place. Finally, energy consumption is just one of the

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[9] PwC. "Global FinTech Report 2017", *PwC*, 17 Mar. 2017,
[10] PwC. "Financial Services Technology 2020 and Beyond", *PwC*
[11] Malavolta, Giulio, et al. "Anonymous Multi-Hop Locks for Blockchain Scalability and Interoperability." *Proceedings 2019 Network and Distributed System Security Symposium*, 2019.
[12] Trillo, Manny. "Stress Test Prepares VisaNet for the Most Wonderful Time of the Year." *Visas Blog Visa Viewpoints RSS*, 10 Oct. 2013.
[13] Deloitte UK, "Blockchain Key Challenges", *Deloitte*

many issues resulting from the Proof of Work protocol. While new consensus mechanisms have been designed over the past few years, Proof of Work is still the most widely used protocol which consumes around 67 terawatt-hours per year as of August 2020 according to the Bitcoin energy tracker at Digiconomist.[14]

III. REMITTANCE INDUSTRY

1. Overview and Background

Remittance refers to the transfer of money from foreign migrants to their families cross-border to their home country. Remittances are not a new concept; their existence has been an integral part of the history of migration. In fact, many European countries in the 19th and 20th centuries depended on remittances which accounted for an important share of their account income. Currently, developing countries are the ones that depend on the most on remittances from migrants in developed countries. According to the United Nations, one in nine people, or approximately 800 million globally depend on remittances sent by migrant workers to support their families. In addition, remittances are the biggest financial inflow received by most developing economies, which is worth three times as much as foreign aid.[15] In 2018, global remittances reached a record-high $689 billion, growing between 7% and 12% depending on different regions of the world.[16] Remittances are an important source of income for developing economies and there is strong evidence of a positive relationship between remittances and socio-economic growth.[17]

According to an Allied Market Research market report, there are three main drivers for the remittance industry: Mobile-based money transfer channels, lower transfer cost and time, and integration with banking and financial services.[18] With the rise of Mobile phone penetration in developing countries, more and more migrants have started using their mobile phones in order to send

[14] Digiconomist, "Bitcoin Energy Consumption Index", *Digiconomist*, Sept. 2020.
[15] United Nations. “Remittances Matter: 8 Facts You Don't Know about the Money Migrants Send Back Home | UN DESA Department of Economic and Social Affairs.” *United Nations*, 17 June 2019.
[16] World Bank. “Record High Remittances Sent Globally in 2018.” *World Bank*, 8 Apr. 2019.
[17] Meyer, Dietmar, and Adela Shera. “The Impact of Remittances on Economic Growth: An Econometric Model.” *EconomiA*, vol. 18, no. 2, 2017, pp. 147–155., doi:10.1016/j.econ.2016.06.001.
[18] Goswami, Aarti, et al. “Remittance Market: Global Opportunity Analysis and Industry Forecast, 2019-2026.” Allied Market Research, Apr. 2020, pp. 64–65.

money to their families. In addition, key aspects of remittance payments are transfer costs and time that have been going down as money transfer technologies get more advanced. Indeed, with more competition between the different remittance players, users have been demanding a better service at a lower cost. The third driver relates to the integration of remittances with banking services, in order to link the transaction to the sender's or receiver's respective bank accounts. This trend is still under development since many people in poor countries are still unbanked.

2. Current Players

The remittance industry has traditionally been dominated by one major player, Western Union, as well as a MoneyGram which has grabbed some market share in the past few decades. These two players control the majority of the remittance market and process most cross-border money transfers. On top of these two players, new fintech startups have entered the market to offer a faster and low-cost service. Below is an overview of each of the two major types of remittance operators:

a. Traditional Money Transfer Operators (i.e, Western Union, MoneyGram)

The money wiring services industry has been mainly dominated by Western Union, a multinational financial services corporation that provides money movement and transfer services. It is now present in over 200 countries and territories, operating in almost every country on the planet.[19] Western Union deals with over 130 different currencies and completes on average 34 transactions every second. In 2018, it moved over $300bn in principle across it's billion different accounts all around the world. According to their website, they are a market leader in remittances and have achieved a global market share of 17%.[20] The rest of the market is highly competitive and fragmented. MoneyGram is also a major player in the remittance and cross-border P2P payment industry, with over 380,000 physical locations around the world.[21]

[19] Western Union Website, "About Us"
[20] Western Union Website, "Become a Estern Union Agent"
[21] MoneyGram Website, "Products and Services"

b. Fintech Startups (i.e, WorldRemit, TransferWise, Remitly)

In the past decade, many fintech startups have entered the remittance market and grown rapidly to be considered important competitors by traditional players such as Western Union. Each startup has come up with a new way of improving remittances while focusing on a specific consumer base or geography. WorldRemit serves a considerable share of African migrants, while Ria Money Transfer targets migrants from Latin American countries, and Azimo focuses on the European Market. Another success story is TransferWise which has experienced the biggest and fastest growth in total annual revenue since its founding in 2011. Through their borderless and global expansion strategies, they have been able to quickly reach over 6 million users and process £4bn in monthly transactions.

3. New Blockchain Entrants

While there are many players that try to provide money transfer services, there still are many issues that remittance users suffer from such as high transfer costs and the presence of many intermediaries in the case of a bank transfer. As a result, the remittance industry is undergoing significant changes made possible through new technological advancements. An example is Cryptocurrencies and Blockchain which provide promising solutions to the problems faced by remittance consumers all around the world. Some of the most prominent blockchain startups in this field are outlined below.

a. Ripple Labs, Inc

Ripple Labs is an American blockchain company that developed the Ripple Protocol, a real-time gross settlement (RTGS) system and remittance network. Launched in 2012, Ripple's operations have grown significantly since its inception and its cryptocurrency XRP has reached a market cap of over $10bn as of September 2020.[22] While Ripple has other business segments related to different banking services, its goal to revolutionize remittances is still a significant part of its long-term objective. For example, it partnered with SBI Remit, Japan's largest money transfer

[22] CoinMarketCap, XRP as of Sept. 2020, https://coinmarketcap.com/

provider, in order to facilitate instant remittance transactions through the blockchain.[23] Ripple also counts other major remittance services providers as customers including MoneyGram, Ria Money Transfer, and Azimo.[24]

b. Stellar

Stellar is a decentralized protocol that facilitates cross-border transactions for money transfers from digital currency to fiat currency. Since its launch, Stellar has facilitated over 450 million transactions between 4 million accounts.[25] Stellar has partnered with many leading organizations in order to work on large scale blockchain system implementation. For instance, it partnered on multiple occasions with IBM to run cross-border transactions on the blockchain, with a focus on South Pacific. [26] In addition to partnering with leading organizations, Stellar also works with local startups to tap into different markets. For example, Stellar partnered with Nigeria-based remittance startup SureRemit which has primary exposure to the African market.[27]

c. BitPesa

According to its website, Bitpesa is a Nairobi based digital foreign exchange and cryptocurrency liquidity provider in Africa.[28] With a focus on frontier markets and Africa, BitPesa has expanded to several countries starting in Kenya and reaching Nigeria, Uganda, Tanzania, and beyond. BitPesa has since 2019 rebranded to AZA Group after securing $15mn in funding from the Development Bank of Southern Africa. BitPesa's goal is to decrease the cost and increase the speed of payments in frontier markets for both individuals and businesses. In addition, it is trying to enable international remittance transactions through cryptocurrency, mobile money, and digital channels.

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[23] Ripple. "SBI Remit Customer Story." *Ripple*
[24] Ripple Website. "Cusomters".
[25] Stellar Website. "Intro to Stellar".
[26] Roberts, Jeff John. "IBM and Stellar Launch Blockchain Banking Across Multiple Countries." *Fortune*, Fortune, 16 Oct. 2017.
[27] Bright, Jake. "Africa's SureRemit Joins the Tokenized Race to Win the Global Remittance Market." *TechCrunch*, TechCrunch, 12 Dec. 2017.
[28] Bitpesa Website. "About us", https://www.bitpesa.co/about/

4. African Remittance Market - Receiving Side

a. Market Overview

Remittance is a critical part of most African economies. Many countries in the African continent rely on remittances as an important source of income for families. A large share of migrants around the world come from Africa, so a considerable amount of money is sent back by these migrants to support their families. According to the World Bank, 2019 numbers for remittances have reached around $48bn in Sub-Saharan Africa alone, excluding North Africa. The MENA region has reached a similar inflow number of $47bn, of which over $40bn is to North Africa.[29] Due to the COVID-19 pandemic, global remittances are expected to fall in 2020, with a sharp decrease of 23.7% in Sub-Saharan Africa and 19.6% in MENA. Recovery is anticipated in 2021, with a modest increase of 4% in Sub-Saharan Africa.

The remittance market in Africa is characterized by certain aspects that are different in other regions. Firstly, many African countries rely on remittances as a critical financial inflow, which can account for a primary income source relative to GDP. For example, South Sudan's remittance inflow was estimated at 34.4% as a share of GDP, the highest in the continent.[30] Secondly, many African families don't have bank accounts or can't get access to banking services so they rely on informal channels to receive money which makes it hard to collect accurate data on the volume of transactions. Thirdly, the remittance market is highly regulated and in some countries restricted to select Money Transfer Operators. As a result of limited competition, these Money Transfer Operators charge excessively high fees per transaction. According to the World Bank, the cost of sending $200 to most countries in Sub-Saharan Africa is about 9%, while Southern Africa has one of the highest costs of over 20%. Luckily, new competitors have started challenging traditional Money Transfer Operators

[29] World Bank. "World Bank Predicts Sharpest Decline of Remittances in Recent History." *World Bank*, 22 Apr. 2020.
[30] Adegoke, Yinka. "Remittances from Migrants to African Countries Will Plunge by Nearly a Quarter This Year." *Quartz Africa*, Quartz, 24 Apr. 2020.

by leveraging the power of technology to reduce the cost of transactions. It is only a matter of time before most governments start accommodating for these disruptive players.

b. Moroccan Remittance Market

Morocco is considered a top remittance recipient in both the African continent and the MENA region. It is ranked 3rd in Africa after Egypt and Nigeria based on remittance inflows, totaling remittances of over $6.7bn in 2019.[31] These inflows account for 5.6% of GDP and are considered as an important source of income. In fact, a large proportion of rural families, reaching around 30% to 40%, depend on remittances from migrant family members.[32] Morocco is one of the countries whose remittances have been the most affected by the COVID-19 pandemic. In fact, they are expected to decline by 17-18 percent due to the additional economic struggles that the euro-zone has been experiencing before the pandemic. Morocco has a strong remittance inflow stream thanks to its large immigrant population that exceeds over 3.1 million people (out of 38 million) in Europe alone as of 2012.[33] Most remittances come from the euro region where a majority of the immigrant population had settled. Other immigration destinations include North America and the Middle East, but they remain negligible compared to Europe.

5. European Remittance Market - Sending Side

a. Market Overview

Europe is an important player in the global remittance market. In 2018, it had a remittance outflow of over $165bn, or approximately around 25% of the world's remittance outflows.[34] These large payments are due to Europe's relatively large migrant worker population residing in the

[31] Global Knowledge Partnership on Migration and Development. "COVID-19 Crisis Through a Migration Lens ." *World Bank Group*, Apr. 2020.
[32] Bouoiyour, Jamal, and Amal Miftah. "The Effects of Remittances on Poverty and Inequality: Evidence from Rural Southern Morocco." *Centre d'Analyse Théorique Et De Traitement Des Données Économiques*, May 2014.
[33] Kusunose, Yoko, and Karen Rignall. "The Long-Term Development Impacts of International Migration Remittances for Sending Households: Evidence from Morocco." *Migration and Development*, vol. 7, no. 3, 2018, pp. 412–434.
[34] World Bank. "Migration and Remittances." *World Bank*, 26 Sept. 2019, www.worldbank.org/en/topic/labormarkets/brief/migration-and-remittances.

continent. While it is home to only 10% of the world's population, Europe hosts over 20% of total immigrants globally.[35] The distribution of flows among all European countries is not uniform as it is concentrated among western territories and the Russsian Federation. The top six countries that provide remittances account for 75% of Europe's total flows. On the receiving side, most of these payments go to poor families in the developing world. Africa is the main destination of a large portion of European remittances due to the colonial and immigration history that tie both continents. According to a report by the International Fund for Agricultural Development, Nigeria and Morocco ranked first and third respectively among all recipients of remittance payments in Europe.

b. French Remittance Market

Within Europe, France is a primary contributor to remittances. In 2018, it was responsible for over $15bn in remittance outflows.[36] France's immigrant population consists mainly of people from North Africa and previous french colonies in Subsaharan Africa. In fact, France is far ahead from any other European country in the number of African immigrants since 2000. Morocco remains the leading origin of migrants in France, where 1 out of 4 African migrants come from Morocco.[37] The relationship between both countries has resulted in strong remittance payments between both countries reaching 2.17 in 2016.[38] To process these cross-border transfers, immigrants go through banks or Money Transfer Operates which control 53% and 47% of the remittance market in France.[39] There are still many issues facing this industry in France and Europe which can be potentially solved through digitalization and Blockchain.

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[35] *Sending Money Home: European Flows and Markets*. International Fund for Agricultural Development (IFAD), June 2015.
[36] World Bank. "Migration and Remittances." *World Bank*, 26 Sept. 2019.
[37] Châtelot, Christophe. "Migrations : Les Africains Optent De plus En plus Pour D'autres Destinations Que La France." *Le Monde.fr*, Le Monde, 11 June 2019.
[38] "Morocco Received $7 Billion in Remittances in 2017." *Morocco World News*, 16 Feb. 2018.
[39] "The Remittance Marketplace in Europe: Competition and Pricing". *The Dialogue*, Nov. 2016.

IV. POTENTIAL OF BLOCKCHAIN IN REMITTANCE

The remittance industry suffers many different problems in both the sending and receiving sides. Some of the most critical problems relate to the large transaction costs and the convoluted transfer process. Blockchain has the potential to overcome many of these challenges through the innovative work of many startups dedicated to the remittance space. We'll look into how the money transfer process could be optimized through various blockchain applications. We'll also address some challenges that blockchain might face in this specific case study.

1. Blockchain's Opportunities in Remittance

a. Streamline the Remittance Process and Disintermediation

The current remittance environment is characterized by its convoluted process that involves many intermediaries from start to finish. For example, if a Moroccan immigrant residing in France wanted to send money back to their family through a bank transfer, their payment process would go through seven intermediaries that link the sender and the receiver: The sender bank, sender's payment system, correspondent bank, foreign exchange, another correspondent bank, the receiver's payment system, and the receiver bank.[40] Each of these intermediaries takes a cut of the transaction fee and increases the final amount that the sender/receiver ends up paying. In the case of Money Transfer Operators such Western Union, the transaction fee is related to four categories: 1.5% payment fee, 3.4% bank card fee, 0.3% bank account fee, and 0.7% pay in-store fee.[41] These fees vary from region to region but they remain high in most transfers. Blockchain is set to remove some of the unnecessary intermediaries that take part in the traditional money transfer process. Thanks to its efficient network for approving transactions, blockchain can skip correspondent banks and streamline a process that would have otherwise taken multiple days to be executed.

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[40] Blockdata. "Blockchain Is Disrupting the $700 Billion Remittance Industry." *Medium*, 7 Mar. 2019.
[41] "How Blockchain-Based Remittance Is Killing Western Union International Money Transfers?" *Crypterium News*.

There are two major potential benefits of using a blockchain-based payment infrastructure instead of the current remittance system: Reduce transaction costs and increased speed. On the cost side, it appears that blockchain's distributed ledger technolgy can lower both fixed and variable costs related to a remittance transaction. An IMF 2017 report claimed that blockchain solutions under development have the potential to process money payments at a fraction of their current cost.[42] While it is difficult to quantify the cost-savings that a blockchain solution can create due to how early-stage the industry still is, it is clear that considerable fees might be eliminated. On the transaction speed side, blockchain solutions have proven to be much faster in approving transactions without trading off accuracy and security. In fact, a report from BlockData shows that Ripple's and Stellar's protocols can approve cross-border transactions in a matter of seconds, while traditional banks and Money Transfer Operators may take several days since they have to go through a correspondent bank.[43] Other startups have proven to process cross-border transactions more efficiently including BitPesa, Abra, and BitShares.[44]

b. Blockchain-Powered Mobile Wallets

Thanks to the high and growing mobile penetration in emerging economies in Africa for instance, payments using blockchain-based mobile wallets have become a real possibility. In fact, mobile wallets are an integral part of powering remittances in the blockchain. In order to avoid money laundering, the current system adopted by traditional players puts the large unbanked or undocumented population at a disadvantage as it forces them to provide a bank account or reliable documentation. As this population turns towards informal channels, this opens up an opportunity for blockchain's distributed ledger technology to step in and serve this untapped market. While there is no need for a bank account, the transaction is still completely transparent since it goes through a public

[42] "Recent Trends in Correspondent Banking Relationships - Further Considerations." *International Monetary Fund*, 16 Mar. 2017.
[43] Schweiger, Lucas, and Daniel Hangan. "Remittance Market and Blockchain Technology." *BlockData*.
[44] Flore, Massimo. "How Blockchain-Based Technology Is Disrupting Migrants' Remittances: A Preliminary Assessment ." *European Commission: Joint Research Center*, 2018.

immutable ledger where you can track every transaction. Mobile wallets also solve the issue of multiple intermediaries, since it allows the user to send money from one wallet to another all under one system including the exchange between fiat currencies and the cryptocurrency.[45] A great example of a startup that utilizes the power of cryptocurrency mobile wallets in emerging markets is Coins.ph. Coin.ph is a bitcoin wallet service based in the Philippines that facilitates cross-border remittance transactions as well as other services such as paying bills. With over 10 million Filipino users, Coins.ph allows users to either retrieve their money as bitcoin or convert it to the local currency.[46]

c. Integration of Blockchain Solutions Within Current Traditional Players

A third consideration while implementing Blockchain in remittances is creating partnerships between traditional remittance corporations and incoming blockchain startups. While blockchain is a disruptive technology, its goal isn't to necessarily kill its competition but rather to supplement it and renovate the infrastructure that banks and Money Transfer Operators rely on. Some major blockchain players have made it a priority to keep great relationships with financial institutions and operate as their partner. For instance, Ripple partnered with Western Union and MoneyGram in 2018 to pilot and experiment its cryptocurrency-focused product xRapid.[47] Later in 2019, Ripple reinforced its interest in partnering with large remittance companies by acquiring a $50 million stake in MoneyGram and expand their xRapid partnership.[48] On the other hand, Western Union teamed up with the Filipino startup mentioned above, Coins.hp, to streamline the remittance process in the Philippines.[49] Through blockchain integration, major Money Transfer Operators will be best positioned to gain from the rise of blockchain and crypto-currencies.

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[45] Davidov, Igor. "Blockchain Use Cases: Remittance." *Binance Academy*.
[46] Coins.ph Website
[47] Browne, Ryan. "Ripple Hints Its Cryptocurrency Product Will Go Live 'in the next Month or so'." *CNBC*, CNBC, 18 Sept. 2018.
[48] De, Nikhilesh. "Ripple Finalizes $50 Million MoneyGram Investment." *CoinDesk*, 26 Nov. 2019.
[49] Palmer, Daniel. "Western Union Integrates With Crypto Wallet to Expand Philippines Remittances." *CoinDesk*, CoinDesk, 8 Apr. 2019.

V. CONCLUSIONS

This paper analyzed the potential of Blockchain in disrupting the remittance payment market. After careful consideration of the different issues facing the industry, it is clear that blockchain can solve many of those issues and open up new possibilities to develop a better service for remittance users across the world. From cost reductions and increased transaction speed to the expansion in the informal and unbanked market, there are many benefits that can be derived from adopting a distributed ledger technology. The question that arises is will blockchain be able to overcome the challenges that it has been facing since its inception. In fact, many researchers have found a gap between the speculative benefits of blockchain and its actual current benefits.[50] Most blockchain solutions discussed in this paper are still in their early stages of development and yet to be proven effective at scale. In addition, there is a lot of regulatory as well as public resistance towards blockchain due to its complexity and historical connection to financial crime.[51] In order to ensure a successful implementation of blockchain in the remittance industry, there certainly needs to be a structural change in the way governments and society perceives blockchain and cryptocurrencies.

[50] Wu, Edward. "International Remittance and Blockchain Technology." *Stanford University Public Policy Program*, Jan. 2018.
[51] Houben, Robby, and Alexander Snyers. "Cryptocurrencies and Blockchain Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion." *European Parliament*, July 2018.

Reference List

A. T. Sherman, F. Javani, H. Zhang and E. Golaszewski, "On the Origins and Variations of Blockchain Technologies," in IEEE Security & Privacy, vol. 17, no. 1, pp. 72-77, Jan.-Feb. 2019, doi: 10.1109/MSEC.2019.2893730.

Binance Academy. “History of Blockchain.” Binance Academy, Binance Academy, 19 Jan. 2020, academy.binance.com/blockchain/history-of-blockchain.

“Bitcoin Price, Charts, Market Cap, and Other Metrics.” CoinMarketCap, Sept. 2020, coinmarketcap.com/currencies/bitcoin/.

Marr, Bernard. “A Very Brief History Of Blockchain Technology Everyone Should Read.” Forbes, Forbes Magazine, 20 Mar. 2018, www.forbes.com/sites/bernardmarr/2018/02/16/a-very-brief-history-of-blockchain-technology-everyone-should-read/.

Gupta, Vinay. “A Brief History of Blockchain.” *Harvard Business Review*, 21 Aug. 2019, hbr.org/2017/02/a-brief-history-of-blockchain.

Antonopoulos, Andreas M. “Mastering Bitcoin. Unlocking Digital Crypto-Currencies.” O'Reilly Media, Apr. 2014.

“5 Common Blockchain Applications in Financial Services.” *Hydrogen*, 13 Dec. 2019, www.hydrogenplatform.com/blog/5-common-blockchain-applications-in-financial-services.

“Blockchain in Finance & Fintech: The Future of Financial Services.” *ConsenSys*, consensys.net/blockchain-use-cases/finance/.

PwC. *Global FinTech Report 2017*. PwC, 17 Mar. 2017, www.pwc.com/jg/en/publications/pwc-global-fintech-report-17.3.17-final.pdf.

PwC. *Financial Services Technology 2020 and Beyond ... - PwC*, www.pwc.com/gx/en/financial-services/assets/pdf/technology2020-and-beyond.pdf.

Malavolta, Giulio, et al. “Anonymous Multi-Hop Locks for Blockchain Scalability and Interoperability.” *Proceedings 2019 Network and Distributed System Security Symposium*, 2019, doi:10.14722/ndss.2019.23330.

Trillo, Manny. “Stress Test Prepares VisaNet for the Most Wonderful Time of the Year.” *Visas Blog Visa Viewpoints RSS*, 10 Oct. 2013, www.visa.com/blogarchives/us/2013/10/10/stress-test-prepares-visanet-for-the-most-wonderful-time-of-the-year/index.html.

Deloitte UK, "Blockchain Key Challenges", *Deloitte*, https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/Innovation/deloitte-uk-blockchain-key-challenges.pdf

Digiconomist, "Bitcoin Energy Consumption Index", Digiconomist, Sept. 2020 https://digiconomist.net/bitcoin-energy-consumption

United Nations. “Remittances Matter: 8 Facts You Don't Know about the Money Migrants Send Back Home | UN DESA Department of Economic and Social Affairs.” *United Nations*, 17 June 2019, www.un.org/development/desa/en/news/population/remittances-matter.html.

World Bank. “Record High Remittances Sent Globally in 2018.” *World Bank*, 8 Apr. 2019, www.worldbank.org/en/news/press-release/2019/04/08/record-high-remittances-sent-globally-in-2018.

Meyer, Dietmar, and Adela Shera. “The Impact of Remittances on Economic Growth: An Econometric Model.” *EconomiA*, vol. 18, no. 2, 2017, pp. 147–155., doi:10.1016/j.econ.2016.06.001.

Goswami, Aarti, et al. “Remittance Market: Global Opportunity Analysis and Industry Forecast, 2019-2026.” *Allied Market Research*, Apr. 2020, pp. 64–65.

Western Union Website, "About Us", *Western Union*, https://corporate.westernunion.com/index.html

Western Union Website, “Become a Estern Union Agent”, *Western Union*, https://www.westernunion.com/li/en/become-agent.html

Ripple. “SBI Remit Customer Story.” *Ripple*, ripple.com/customer-case-study/sbi-remit/.

Ripple Website. “Cusomters”https://ripple.com/customers

Stellar Website. “Intro to Stellar”, https://www.stellar.org/learn/intro-to-stellar

Roberts, Jeff John. “IBM and Stellar Launch Blockchain Banking Across Multiple Countries.” *Fortune*, Fortune, 16 Oct. 2017, fortune.com/2017/10/16/ibm-blockchain-stellar/.

Bright, Jake. “Africa's SureRemit Joins the Tokenized Race to Win the Global Remittance Market.” *TechCrunch*, TechCrunch, 12 Dec. 2017, techcrunch.com/2017/12/11/africas-sureremit-joins-the-tokenized-race-to-win-the-global-remittance-market/.

Bitpesa Website. “About us”, https://www.bitpesa.co/about/

World Bank. “World Bank Predicts Sharpest Decline of Remittances in Recent History.” *World Bank*, 22 Apr. 2020, www.worldbank.org/en/news/press-release/2020/04/22/world-bank-predicts-sharpest-decline-of-remittances-in-recent-history.

Adegoke, Yinka. “Remittances from Migrants to African Countries Will Plunge by Nearly a Quarter This Year.” *Quartz Africa*, Quartz, 24 Apr. 2020, qz.com/africa/1844973/world-bank-remittances-to-africa-to-plunge-by-a-quarter/.

Global Knowledge Partnership on Migration and Development. “COVID-19 Crisis Through a Migration Lens .” *World Bank Group*, Apr. 2020, openknowledge.worldbank.org/bitstream/handle/10986/33634/COVID-19-Crisis-Through-a-Migration-Lens.pdf?sequence=1&isAllowed=y.

Bouoiyour, Jamal, and Amal Miftah. “The Effects of Remittances on Poverty and Inequality: Evidence from Rural Southern Morocco.” *Centre d’Analyse Théorique Et De Traitement Des Données Économiques*, May 2014, https://mpra.ub.uni-muenchen.de/55686/.

Kusunose, Yoko, and Karen Rignall. “The Long-Term Development Impacts of International Migration Remittances for Sending Households: Evidence from Morocco.” *Migration and Development*, vol. 7, no. 3, 2018, pp. 412–434., doi:10.1080/21632324.2018.1475383.

World Bank. “Migration and Remittances.” *World Bank*, 26 Sept. 2019, www.worldbank.org/en/topic/labormarkets/brief/migration-and-remittances.

“Sending Money Home: European Flows and Markets”. *International Fund for Agricultural Development (IFAD)*, June 2015,

www.ifad.org/documents/38714170/40187194/money_europe.pdf/b0003fbb-bb10-4f3c-90c7-f12fdc3c450b.

World Bank. “Migration and Remittances.” *World Bank*, 26 Sept. 2019, www.worldbank.org/en/topic/labormarkets/brief/migration-and-remittances.

Châtelot, Christophe. “Migrations : Les Africains Optent De plus En plus Pour D'autres Destinations Que La France.” *Le Monde.fr*, Le Monde, 11 June 2019, www.lemonde.fr/afrique/article/2019/06/11/les-africains-qui-migrent-viennent-de-moins-en-moins-en-france_5474740_3212.html.

Morocco Received $7 Billion in Remittances in 2017.” *Morocco World News*, 16 Feb. 2018, www.moroccoworldnews.com/2018/01/239463/morocco-receives-7-billion-remittances/.

“The Remittance Marketplace in Europe: Competition and Pricing”. *The Dialogue*, Nov. 2016, www.thedialogue.org/wp-content/uploads/2016/11/The-remittance-marketplace-in-Europe-competition-and-pricing.pdf.

Blockdata. “Blockchain Is Disrupting the $700 Billion Remittance Industry.” *Medium*, 7 Mar. 2019, medium.com/@blockdata_tech/blockchain-is-disrupting-the-700-billion-remittance-industry-b79a01a95a10.

“How Blockchain-Based Remittance Is Killing Western Union International Money Transfers?” *Crypterium News*, news.crypterium.com/how-blockchain-based-remittance-is-killing-western-union-international-money-transfers.

“Recent Trends in Correspondent Banking Relationships - Further Considerations.” *International Monetary Fund*, 16 Mar. 2017, https://www.imf.org/en/Publications/Policy-Papers/Issues/2017/04/21/recent-trends-in-correspondent-banking-relationships-further-considerations.

Schweiger, Lucas, and Daniel Hangan. “Remittance Market and Blockchain Technology.” *BlockData*, https://download.blockdata.tech/blockdata-remittance-market-blockchain-technology.pdf.

Flore, Massimo. “How Blockchain-Based Technology Is Disrupting Migrants' Remittances: A Preliminary Assessment .” *European Commission: Joint Research Center*, 2018, https://ec.europa.eu/jrc/sites/jrcsh/files/blockchain_and_remittances_online.pdf

Davidov, Igor. “Blockchain Use Cases: Remittance.” *Binance Academy*, https://academy.binance.com/blockchain/blockchain-use-cases-remittance

Browne, Ryan. “Ripple Hints Its Cryptocurrency Product Will Go Live 'in the next Month or so'.” *CNBC*, CNBC, 18 Sept. 2018, www.cnbc.com/2018/09/17/ripple-hints-cryptocurrency-product-xrapid-will-go-live-soon.html.

De, Nikhilesh. “Ripple Finalizes $50 Million MoneyGram Investment.” CoinDesk, CoinDesk, 26 Nov. 2019, www.coindesk.com/ripple-finalizes-50-million-moneygram-investment.

Palmer, Daniel. “Western Union Integrates With Crypto Wallet to Expand Philippines Remittances.” *CoinDesk*, CoinDesk, 8 Apr. 2019, www.coindesk.com/western-union-integrates-with-crypto-wallet-to-expand-philippines-remittances.

Wu, Edward. “International Remittance and Blockchain Technology.” *Stanford University Public Policy Program*, Jan. 2018, https://publicpolicy.stanford.edu/sites/g/files/sbiybj9416/f/publications/ed_wu_ma_thesis.pdf

Houben, Robby, and Alexander Snyers. “Cryptocurrencies and Blockchain Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion.” *European Parliament*, July 2018, https://www.europarl.europa.eu/cmsdata/150761/TAX3%20Study%20on%20cryptocurrencies%20and%20blockchain.pdf