Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law

Migrant Remittances: Can electronic payment systems like Bitcoin improve conditions of international money transfer?

Tim Riedler

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Tim Riedler

373863

Hermannstraße 31

12049 Berlin

t.riedler@gmx.de

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First Examiner: Prof. Dr. Metzger

Second Examiner: Prof. Dr. Pédussel Wu

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1 Introduction

By the end of the year 2015 65.3 million people were fleeing from their home countries. This is the highest number ever determined by the UN Refugee Agency. The number is 9.5 % higher than in 2014 and only includes by definition approved refugees, internally displaced persons and asylum seekers (cf. UNHCR 2015, p.2). Many people who are fleeing from economic inequality, poverty and miserable living conditions don't appear in this statistics. The worldwide income inequality and disparity in economic power affect the global public dialogue more than ever. On January 1st 2016 the new development policy agenda of the United Nations inured, the Sustainable Development Goals. 17 SDGs were set and ratified with a lifespan of 15 years. Therefore these goals are commnly condensed as the Agenda 2030. Main focus of the Agenda 2030 is to ensure a global, sustainable development under economic and ecological perspectives. Sustainable Development Goal Number 10 claims to "reduce inequality within and among countries" (United Nations 2017). Among the visions and inputs to create more equality within and among countries the report of the Secretary-general sees that migrant remittances are a powerful developmental instrument that has a huge impact on the economy of poor countries. But in the report it is also accused that the conditions, especially the costs of sending money with 7.5% of the lump sum are hindering the remittances to develop their full potential (cf. United Nations 2016, p. 15). Therefore the explicit subitem 10.c of Sustainable Development Goal #10 targets to reduce the average transaction costs for remittances to under 3 per cent and "eliminate remittance corridors with costs higher than 5 per cent" (World Bank Group 2016A, p.1). The demand to reduce transaction costs for migrants is seen as a possibilty to reduce the overall inequality.

At the same time as the global inequality increases there is a vast number of means to send money cross-border fast in terms of today's technical possibilities. All transactions performed by traditional financial institutes like banks are computerized and the formal process of shifting money to foreign account and convert currencies can be done in seconds, whereas the varification process can take days up to weeks. Alternative monetary systems and so called cryptocurrencies can process transfers and it's varifications nearly in real-time. Further there are nearly no transaction costs for Bitcoin transfers in comparison to an average of 7.5 % up to 11.2 % per transaction in the traditional banking sector (cf. World Bank Group 2017, p. 12). Another part of the technological process is that the mobile phone penetration and internet penetration in development countries is increasing fast and mobile transfer systems are on the march in these countries. These transfer systems can be based on the local currency, an alternative currency or a cryptocurrency like Bitcoin. The affinity to use these systems in development countries tends to be high since the trust in local currencies is rather low.

1.1 Motivation

Remittances are a very important factor for the economic and cultural development of especially poorer countries. A decreasing price in remittances enables citizens in developing countries and rural areas to some extent live more self-paced, as they have more resources available. Since there is very little research on the effect of new financial technologies and alternative remittance methods, this paper tries to give an overview of what traditional remittance channels there are, what alternative channels emerged in the last years and how they compete with each other. All channels should be evaluated and compared to each other both traditional channels and alternative channels. It is tried to analyze the impact that alternative transfer methods like Bitcoin and mobile money can have on the remittance sending and receiving conditions of migrants.

The paper focusses on the traditional remittance market and the alternative channels Bitpesa and M-Pesa. Further the Asian Market is included, because it is the biggest remittance market and a very vibrant one. It is highly technological and many startups and fintechs enter this market currently. References are made to other markets to have a global perspective of interesting developments in the remittance industry.

1.2 Methodology

This paper includes a current literature review on remittances and on alternative money transfer methods and tries to link both. There is very few papers and research that combine remittances and alternative transfer methods since the market is just arising. Also, newspaper articles are included due to the lack of scientific resources. Regressions are included to prove the impact of alternative payment systems and remittances on certain variables and the other way around. The functionality of traditional and alternative remittance channels is explained and compared. It is differentiated between mobile cash systems and the cryptocurrency Bitcoin, because the mechanisms are completely different, but both can benefit the remittance market in similar ways. The World Bank Group employs a migration and remittance team, which observes the remittance market, publishes papers with improving proposals and runs a database on remittance pricing. Those reports and data builds the basis for evaluating the remittance prices. This evaluation is an important part of the analysis, because prices are the main influence on picking a remittance channel and have direct impact on the receiving country's GDP. Own assumptions and conclusions are made regarding to how alternative monetary systems can improve the remittance market overall and the sender's respectively receiver's conditions.

2 Remittances

Remittances are defined as the procedure of sending money or goods in what way ever to a receiver that is distant from the sender. This can happen intranational or across borders. The World Bank differentiates between 3 types of remittances. "1) workers' remittances, which are transfers by migrants considered as residents, 2) compensation of employees, which includes transfers by nonresident migrants, seasonal workers and cross-border workers, and 3) migrant transfers, which usually include transfers of goods or financial assets. "(Gesellschaft für Internationale Zusammenarbeit 2013, p. 6)

This paper will focus on remittances sent by migrants working in a foreign country that send money back home to their relatives and friends. This chapter gives a short introduction in the economics of remittances and tries to reveal the most important motives and what impact is made by remittances in the country of origin. As a last point, the remittance market and its whole global dimension is reviewed.

2.1 Motives

This section names 4 possible motives for remittances that are often mentioned in the literature. They are not reviewed or evaluated to the point which of them is more likely to be a bigger influence for the working migrants. It is tried to explain these motives by the means of examples.

The motives of migrants sending remittances to their home country can be very variant, since every one of them has their own story. Finding out what drives migrants to remitting has been the purpose of many empirical studies. Altruism in the sense of a selfless supporting of families and friends in the home country is seen as a leading motive for remittances. This theory is based on the supposition that people have an intrinsic necessity to support their families and friends. This act of remitting is done completely voluntarily (cf. for this passage Piracha, et. al. 2011, p.7).

Furthermore, remittances can be seen as a way of insurance for the stayed home. This so-called insurance payment is on the primary list of remittance researchers. This is in the literature often referred to as a contractual relationship between sender and receiver of remittances. A sort of insurance payment is made to the family.

This can counteract a small income of the household or cover actual health or insurance costs, that need to be paid by the receivers. As many of the receiving families are dependent from agriculture, remittances can also counteract crop failures or subsidize the farming activities of the family. The initiator for this kind of dependency can be the migrant themselves when they feel responsible for the family that they were raised by or for their own children and husbands/wives. The migration work can also be initiated by the family who send their children abroad when they are old enough. The contractual basis of this remittance relationship is more figuratively and implicit in most of the cases (cf. for this passage Piracha, et. al. 2011, p.10).

The sender of remittances can pay for services with their remittances. A person who wants to migrate to another country and leaves a house, business or farm behind needs someone to take care of it during their stay in another country. By remitting to a contact person, house keeper, security guard or employee the remittance sender is able to take care of their belongings back home (cf. Ansala 2012, pp. 17-18).

The investment of migrant workers is also a motive that is seen as a strong factor for remittances. Workers abroad can invest in several things. A reinvestment for paying off loans for their education or house construction is conceivable. They also can directly invest in the education of their children. Further investments can include businesses or assets owned by the sender or the sender's family (cf. Ansala 2012, pp. 20).

2.2 Global Market and Participants

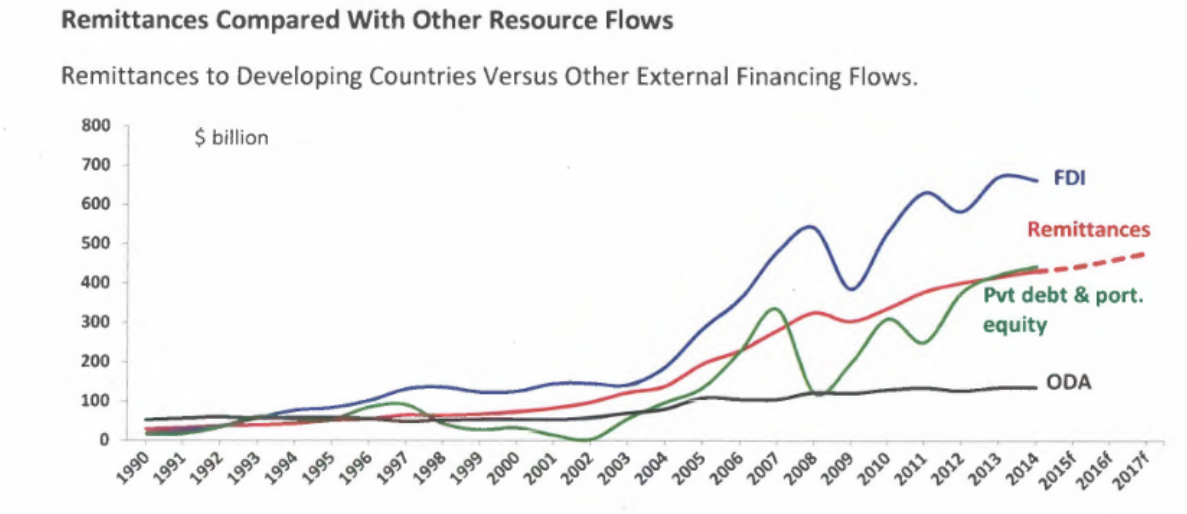

Figure 1: Remittances Compared With Other Resource Flows
Source: World Bank Group (2016): Migration and Remittances Factbook 2016, Washington D.C.: World Bank, p. 17

Figure 1 shows the international transfer sums development of foreign direct investments, remittances, private debt and portfolio equity and official development aid over the time span of 1990 to 2014 and a forecast of remittances until 2017. It can be seen that the FDI, ODA and remittance cash flows are very close together until the turn of the millennium. Then in the early 2000s when the digitalization forged ahead and the global connections and networks became closer there was a high volatility and strong increases and downfalls in FDI and private debt & portfolio equities, while remittances and ODA were almost steadily increasing. This implies that the amount of FDI and private debt is much more liable and dependent from international interest policies and economic crises. Remittances grew much faster than the official development aid and is today about thrice as big. The forecast for 2015 of sent remittances to development countries was 441 billion US $. FDI has been the largest number ever since except the early 1990s.

When China's foreign direct investments are excluded from the total amount remittances are even higher than the FDI (cf. for this passage World Bank Group 2016, p. 17). The top five remittance receiving countries in 2014 were China, India, the Philippines, Mexico and France. While the top five remittance receiving in percentage of GDP in 2014 were Tajikistan, the Kyrgyz Republic, Nepal, Tonga and Moldavia (Ibid, pp. 12 - 13). It shows that the total amount of remittances is highest in larger and more developed and advanced countries. But smaller, low income countries with a high poverty rate are much more dependent from remittances since they take a large position in their national account.

Gender plays an important role when looking at remittances. "At the global level, female migrants send approximately the same amount of remittances as male migrants" (International Organization for Migration 2010, p.1) In the economic and social research the issues exclusively women are facing when sending remittances are often faded out. In general women tend to send remittances to other women who take care of their children, make their education possible or oversee the housekeeping, while men tend to send remittances to their women who take care of the children (cf. Ibid.).

A research of 2006 on gender specific determinants in remittances analyzed a data set with 3,566 observations. The data is based on questionnaires responded to by random remitters in metropolitan areas exclusively interviewed in formal remittance shops in Germany, the UK and the USA. Receiving regions were South America, Central America, the Caribbean and Africa. In the mean the remitters were 36.7 years old and 38.6 % of them were women. The remittance workers had an average education in years of 12.35 (cf. for this passage Orozco et. al. 2006, p. 22). A sample of a study in the Netherlands with 1,680 remittance sending respondents had a share of 53 % female remitters. 79 % of the 1,680 people received a higher than secondary education (cf. Kosse et. al. 2014, p. 31).

2.3 Impact in Country of Origin

The superior target of remittances from the micro perspective is to improve the living conditions of the people in the country of origin and strengthen their economic situation. On the macro levels remittances aim to reduce poverty in a region or a country and support the economic growth. In addition to that, a more self-serving motive of improving the own living conditions and remittances as a positive by-product can be assumed as a catalyst for migration. Remittances provide an external increase of the allocable budget of households in developing countries. It must be clear that households receiving remittances are in a better financial situation than households that are not supported by remittance senders. As studies show, remittances have a positive impact on the general income level of receiving households, the spending power and on decreasing the possibility of sliding into poverty (cf. Ratha 2013, pp. 5 - 6). "One cross-country study of 71 developing countries found out that a 10 percent increase in per capita official international remittances would produce a 3.5 percent decline in the share of people living in poverty" (Ratha 2013, p. 5). Evidential research in Mali could prove that especially in remote areas that are highly dependent on remittances from friends and families a large decrease of people in poverty was achieved by sending money to these regions (cf. Gubert, et. al. 2010, p. 23). A study from Harvard University found that remittances are dependent from the economic cycle in the sending and in the receiving country. If there is an economic boom in the sender's country more remittances are provided and if there is a downturn or a crisis in the receiver's country also more remittances are provided (cf. Frankel 2010, p. 10). This also includes political crises as seen in Egypt during Arab spring where all official subsidies and private donations massively decreased and the amount of remittances doubled from 7.15 billion US $ in 2009 to 14.32 billion US $ in 2011 (cf. Ratha 2013, p. 6).

The study "Remittances and their impact on Economic Growth" by Shera and Meyer attested the remittances to Albania to have a positive effect on the local economy relative to other variables like inflation and FDI. A 1 per cent rise in remittances to Albania was followed by a 0.14 growth in GDP per capita (cf. Meyer, et. al. 2012, p. 17). Gow and Salahuddin investigated the relationship of economic growth and remittances. The investigation focused on panel data from some of the largest receiving countries like India, Pakistan and the Philippines from 1977 to 2012. It found out that there is a positive cross-sectional relation between the variables economic growth and remittances in the short run. This relation is nevertheless insignificant (cf. Gow, et. al. 2015, p. 10). Nepal was the third biggest remittance receiving country in percentage of the GDP in 2014. 29.2 % of Nepal's GDP in 2014 represented remittance payments (cf. World Bank Group 2016, p. 13). This shows how also countries with larger populations are dependent on remittances. But still "the consequences of remittances on long-term economic development are not well understood. "(cf. Meyer, et. al. 2012, p. 14).

3 Remittance Transfer

When looking at remittances the two determining factors of influence on the amount of money transferred by migrants are the remittance channels and the remittance fees. The remittance channel is defined as the transfer system which ensures that the money reaches the receiver's address in a certain amount of time. The remittance fees are the costs that migrants have to subtract from the remittance sum for paying the service of the remittance provider. This chapter introduces the transfer channels that are frequently used by migrants for monetary transfer. The single transfer channel's working mechanisms will be shortly explained and evaluated based on their efficiency and risks. This explanation is needed for a better comparison with alternative remittance methods that will be discussed later on.

Thereby references are made to in what cases informal and formal channels are used. Further this chapter sums up what costs occur when formal channels are used, but also gives a general overview of remittance fees worldwide and to global corridors. The usage of informal channels can't provide actual cost reports. In the informal context, it is rather analyzed under what circumstances these are used.

3.1 Transfer Channels

Transfer Channels first of all need a sender, located in one country and a receiver in the home country of the sender. Also, an intermediary in both country is necessary to transfer the money and make it possible to collect or make it accessible. Between both intermediaries, a transfer communication method or so called interface is used to enable the way for the money from point A to point B (cf. International Monetary Fund 2009, p. 4). This abstract scheme of 5 stations (see figure 2) works for nearly all of the transfer channels. Migrants have many different options to send money to their country of origin. In general, the transfer channels are classified as informal and formal channels. Formal channels include every officially verified and publicly used monetary sending service, such as financial institutions like banks, registered Money Transfer Operators (MTOs) and electronic web-based money sending systems. Other ways to send remittances are autonomically managed transfers and informal MTOs with no official transferring registration. These are commonly referred to as informal sending channels (cf. International Monetary Fund 2009, p. 13).

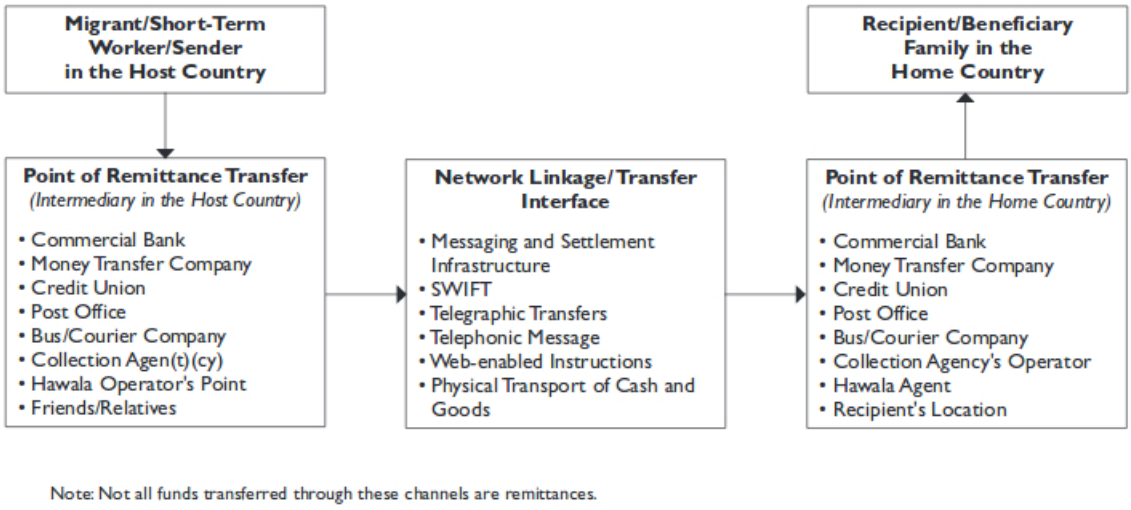

Figure 2: The five stations of remittance channels
Source: International Monetary Fund (2009): International Transactions in Remittances – Guide for Compilers and Users, p. 7

Figure 2 shows the different ways that the money can travel when passing these 5 stations. Common examples for transfer interfaces and intermediaries in both countries are presented. The intermediaries reach from commercial telecommunication networks like SWIFT to the private physical transport of money. Commercial banks almost exclusively use the SWIFT network.

William Blair & Company, a financial investment and research company, estimated in 2014 that about 40 % of worldwide remittances are made through informal channels, while 60 % of the transactions are proceeded via formal channels (cf. Plubins 2015, p. 5). A survey from 2007 found out that in Ghana 43 % of international migrants send money back home via formal channels, whereas only 1 % of internal migrants use these channels to transfer money to their relatives or communities (cf. Adams 2007, p. 29). In 2005 Freund and Spatafora estimated the informally remitted sum to be 35 to 75 % as large as the formal sum (cf. Freund, et. al. 2005, p. 22). This wide range of estimated market shares of informal remittances shows how nontransparent the transfers via all kinds of inofficial MTOs are.

The World Bank Group estimated the informal sector 50 % as large as the formal remittance sector in 2006 (cf. World Bank Group 2006, p. 92). There is no transparency in the informal remittance market and informal transfers can't be tracked. So, informal remittance statistics are based on vague unrepresentative questionnaires and studies. This makes the estimations differ from each other widely.

The most formal, reputable and secure way to transfer money cross-border is the bank transfer. Banks guarantee for the money to arrive at the country cross-border and in many cases, have their own transfer interface, so that transfer failures are very unlikely and if they appear the costumer gets reimbursed. Although commercial banks are the most reliable money transfer provider they are far from dominating the remittance market. They still manage a great amount of global remittances but their formal and informal components are poaching customers from the banks.

Further, the technological innovation in remittances is constituting a threat for the banks. When two countries are closely located or both members of the same currency zone, banking happens to take over a dominant role in this remittance corridor. Many banks run branches in their neighboring country. So, the fees are relatively low or even free when migrants remit to an account of a branch within their own banking network. Migrants within the EU for example can work abroad and still run an account of their home bank. That fact explains among others why for example in Bulgaria the banking market is dominated by foreign European banks. Bulgaria is a country with a large number of people living in the foreign countries of the EU and sending remittances. Among the top 5 banks in Bulgaria there are four foreign banks with nearly half of the total market share (47,68 %) (cf. thebanks.eu 2016). Looking at the past this gets even clearer, because in the year 2006 the five biggest Greek banks had a market share in Bulgaria of 25 to 30 % (cf. Development Centre of the OECD 2007, p. 87).

Commercial banks are in many cases an attractive transfer channel when they have a broad network of branches or/and ATMs in the output as in the receiving country.

A direct remittance payment via bank as an intermediary presupposes that the sender owns a bank account of this certain bank and the receiver at least owns any bank account which is the addressee of the payment. Often commercial banks are also included in the clearing process of MTOs as they undertake the transfer of money between the multilateral MTO agents and subagents with their individual interface. Those international banks are interposed in an MTOs sending system whenever the clearing center and the agent are not located in the same country. Also, the company-internal cross-border transactions of MTOs are made account-to-account. By this practice banks are invisibly involved in the MTOs business model and depending on what fees they charge for balancing the accounts and clearing activities they earn money out of the remittance process of MTOs. Those fees are usually tied to an upfront negotiated agreement which defines the requirements and conditions of the relationship of both parties (cf. International Monetary Fund 2009, p.10).

So called registered or official Money Transfer Operators are financial enterprises that are specialized on remittance transfer and are registered companies. The biggest MTOs with a total market share of 24% of the formal remittance market are Western Union, MoneyGram and Ria (cf. Plubins 2015, p. 5). The general input payment for remittances through MTOs is made cash. There are large MTO-networks with many agents with branches in countries all over the world, some agents are linked to local open-late stores, post offices or mobile communication shops. The MTOs provide the remittances and conduct the transaction. Some have their own internal clearing interface and some as mentioned above include a bank's transfer interface. The receiving channel is an agent or branch on the spot in the sender's country of origin. The receiving individual is paid out cash again by the agent. Agents can also be independent and not work for one single but more MTOs. A customer approaches the subagent with a wish to send cash to a foreign country.

They bring their valid ID with them and both parties agree on a certain verification question which's answer authorizes the receiver to pick up the money. The customer needs no membership or bank account. The subagent transfers the money to the agent. The agent forwards this payment to the banking account of another agent in the destination country. When the payment is valid the money is sent to the subagent in the region where the receiver is located. When the ID of the receiver is fitting and they answer the verification question correctly, the money can be picked up or delivered (cf. International Monetary Fund 2009, p. 9).

The upfront partnership of MTOs and banks allows the MTOs to pay out the money to the receiver very fast. They don't have to pay the normal high banking fees and the banking transfers happen much faster than ordinary banking transfers. The cash flow can happen immediately, because the MTO as a customer doesn't need to be audited. Promoted employees take care of these transactions directly. The whole interfacing process is customized.

The attractiveness of the annual increasing amount of remittances causes companies from other fields of activity to join in and function as a MTO. For example, the US Postal Service offers international money orders. One can send money abroad up to the limit of 700 $ (USPS.com 2016). Other post offices and post banks worldwide are cooperating with official MTOs, for example the remittance provider Ria has partnerships in most of the Asian and about half of the African countries (cf. Plubins 2015, p. 10). Banks and MTOs cover the major amount of money remitted formally.

A third category of smaller players is the web-based money sending institutes. The money transaction enabled by these providers happen peer-to-peer[1], which means that one device can directly send money to another. The peer-to-peer transfers only take a few minutes to be completed.

[1]A peer-to-peer connection is the direct communication between 2 devices. A mobile phone or PC connects to another device within a network. Both connected devices are equivalent and and data can be sent directly to the Opponent.

These peer-to-peer intermediaries are linked to traditional financial institutes in most cases. They are getting more and more attention and are partly better reputated than banks and MTOs when it comes to remittances.

A sum of 17 billion US $ in peer-to-peer money transactions worldwide is called by Forrester Research as a forecast for the year 2019 (cf. Life Sreda 2016, p. 165). A well-known example for web-based international money transfer platform is the web application PayPal, which directly recalculates the transferred sum in a foreign currency. In 2015 the PayPal group acquired the company xoom, which focuses on sending remittances from the United States of America to other countries (cf. PayPal 2016). The linkage happens through a mandatory bank account to send and receive money with xoom and PayPal. So, received money is virtually stored in a person's paypal account and can be transferred to a verified bank account. Also, many online and actual stores accept a direct payment via PayPal or xoom. But apart from xoom in the USA, PayPal is nearly nonexistent in worldwide remittance competition[2]. Or how Hugo Cuevas-Mohr puts it: "And why Paypal, who offers an international personal payments service, has never made a concerted push on the remittance market, is also an intriguing question. "(cf. Cuevas-Mohr 2015).

While xoom is dominant in the USA sending market, a competitor, the UK startup WorldRemit, is arriving on the scene. Via WorldRemit customers can send money from 50 countries and money can be received in 117 countries, but focusing on the US remittance market since it is the biggest sending market with about 10 % of overall global remittances. To date WorldRemit generated funding of a total of 140 million US $. Another feature is the ability to send credits to mobile wallets that are connected to mobile cash systems like M-Pesa. 100,000 transaction to mobile accounts via WorldRemit are processed every month (cf. Life Sreda 2016, p. 167).

[2]In 2013 PayPal acquired Venmo, a money transaction platform, which is rather used for domestic transfers and purchasing goods than for remittances.

The web-based, licensed applications like xoom and WorldRemit are considered as formal channels, because they are licensed (affiliated) companies and every of their transfers can be tracked and located. The target of every transfer is clear and there can not be veiled transactions.

Informal remittance channels are not very highly reputated in contemporary remittance research. In the informal remittance sector there are complex transfer systems like “Hawala“ in Pakistan, “Fei Ch’ein“ in China, “Hundi“ in India and “Padala” in the Philippines (cf. El Qorchi, et. al. 2003, p.3). Most of these are traditional banking networks that have been existing since thousands of years. Those channels play an important role in the remittance industry and are widely accepted and approved by migrants. The simplified functional principle of informal remittance systems looks like this: A sender S in a foreign country who wants to send money to their home country approaches an informal operating agent O. This operating agent offers to send money to foreign countries. The worker hands them the money with information of the receiving person such as a code or a password (alike the MTO verification process). Operating agents and contact persons all over the world form a sort of informal network that is coherent in itself. After transmitting the payment information to another agent A in the home country of W a meeting between A and the receiver R is set up. The money is paid out when R tells the password or fulfills the agreed terms. Usually a fixed fee has to be paid for the service. Now agent A owns agent O the paid amount of money. This debt is balanced with an individual clearing system (cf. International Monetary Fund 2009, p. 14)

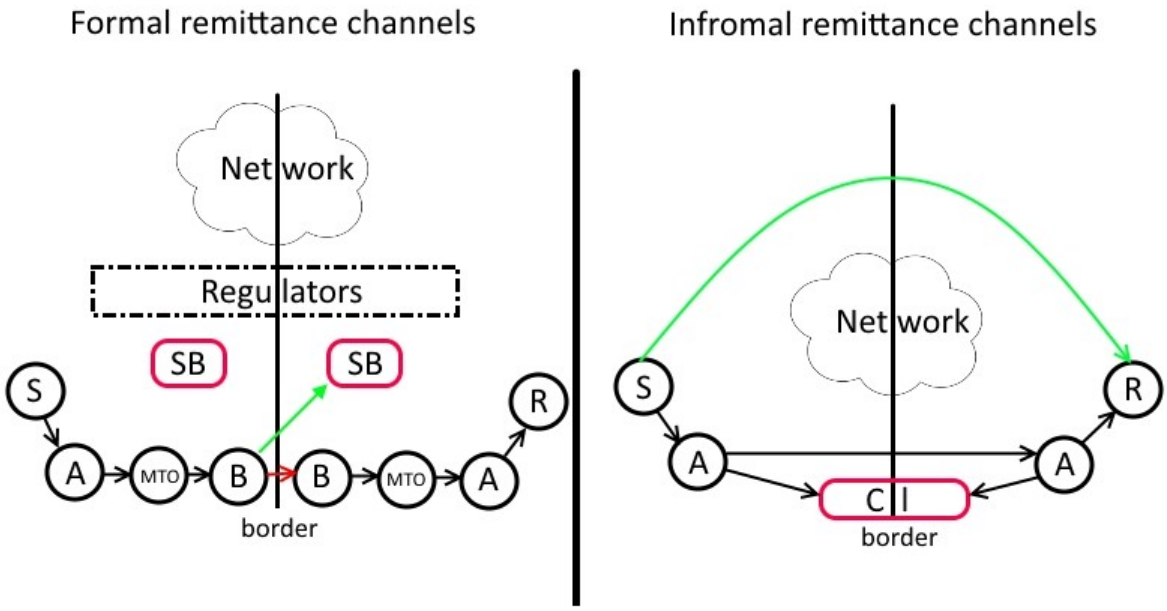

Figure 3: Model - Formal and informal remittance channels
Source: Own illustration referring to Khan, F. (2014): Traditional Remittance Model, accessible at: https://www.quora.com/Who-can-disrupt-the-Money-Transfer-market-using-Bitcoins

The simplified remittance concept in figure 3 clarifies the advantage of informal transfer systems. It has a cross-border network of agents (A). Sender S can approach any of these agents A, who contacts the agent A cross-border with the wish to pay out money to the receiver R. While this is done, S tells R the needed information like passwords or codes (curved arrow). The only monetary transaction happens when the internal cross-border clearing system Cl is used and the balances of both agents are compensated. The whole process is free from regulation and can happen very fast. Formal remittance company branches also form cross-border networks. These networks underlie international and national regulations. The value chain is much longer as the Sender S approaches the Agent A who contacts the MTO which then disposes the bank to transfer money to a cross-border bank account. The bank has to contact the foreign settlement bank SB which provides the official exchange rate for the bank transfer.

When the converted amount of money reached to receiving country, it can be forwarded by the MTO to the agent A. Receiver R gets paid out in exchange of showing their ID. These involved steps lower remittance speed and raise costs. The subagent level is not considered in figure 2. Churches, religious organizations or migrant associations can function as unregistrated or inofficial MTOs (Ibid., p. 15).

The advantages of sending money via these informal MTOs are the anonymity and the speed of the transfer. Informal remittances don't need a third party to be sent. A person can take the money along when traveling to their home country. Also, other persons can be commissioned to take the money cross-border. There are contact persons that organize money transfers by traveling. In some cases, money is sent via international mail to the receiver's country. This method is the most insecure due to the lack of knowledge of the transferrer that they are delivering money and the higher probability of mail going missing. These individually organized channels are not analyzed any further because they are more of peripheral matter and the data availability is very poor (Ibid., pp. 10 - 15).

Ancillary to the low reputation in research informal remittance channels also have a low reputation in general among mainstream social-, economic- and political scientists. These channels are prejudged as insecure or even illegal just because of their informal character. They are seen as reactionary although they are in many cases a much faster alternative to formal remittance channel. Therein a negative approach of scientists to transfer methods outside of the banking system is expressed (cf. Mussil 2010, p. 79). This mistrust is not justified since many migrants seem to be satisfied with the informal service since the informal networks are functioning and involving many customers in the remittance process, who would not have an option to send remittances.

Attainability is an important factor for the senders when choosing a remittance channel. Banks are chosen when sending money to more rural areas with inferior build out urban and financial infrastructures.

"[The] availability of appropriate remittance options is important. People living in urbanised areas are more likely to go to an MTO or use informal channels than people living in rural environments, where bank services are often used simply because no other options are available." (Kosse, et. al. 2014, pp. 23 - 24) Further formal channels tend to be used by more educated customers, whereas informal channels are used by unbanked people. Another aspect of choosing a channel for a migrant is the frequency of sending money back home (cf. Kosse, et. al. 2014, pp. 23 - 25). A 2006 cross-country regression by the World Bank resulted that in corridors with higher prices and a higher black market exchange rate the informal flows are higher and the formal flows are lower (cf. The World Bank Group 2006, p. 92).

3.2 Remittance Fees

Besides all the in chapter 3.1 listed causes for choosing a channel the main point that affects the selection of a transfer channel seems to be the remittance costs and everything related to them. As already mentioned in the introduction the official report of the United Nations concerning the SDGs assumes the worldwide average rate of remittance fees to be at 7.5 % in 2015 (cf. United Nations 2016B, p. 8). The remittance costs are closer observed by the World Bank. Since 2008 they publish a quarterly report on the development of remittance costs.

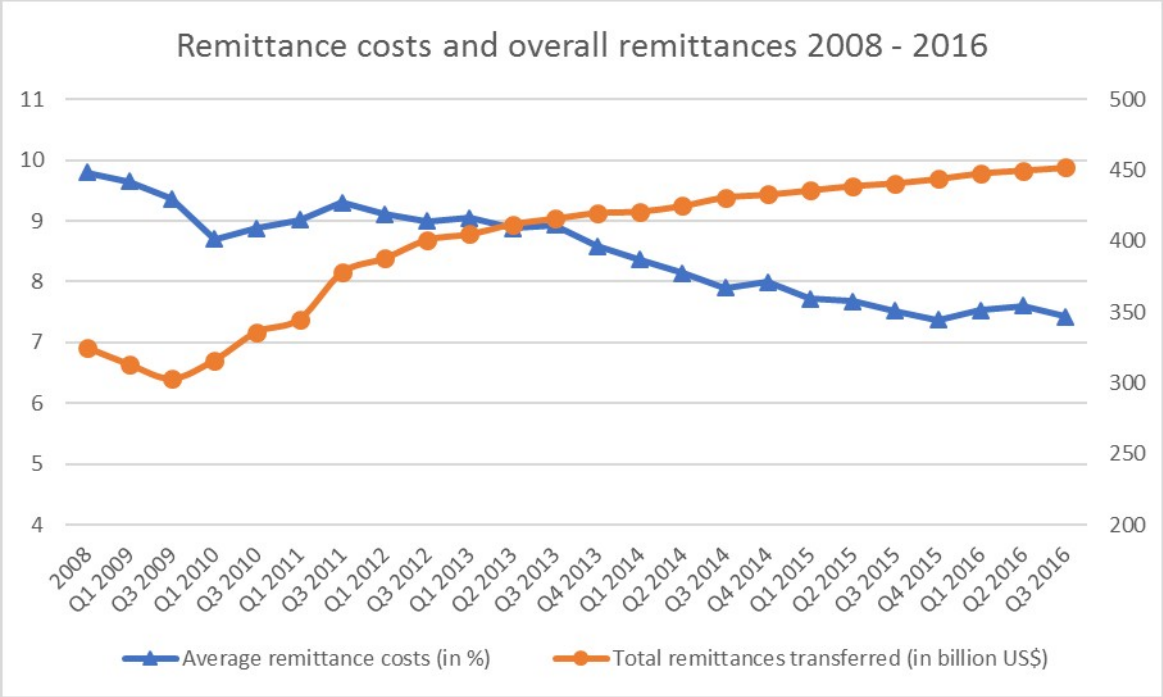

Figure 4: Remittance costs and overall remittances 2008 – 2016
Source: Own illustration referring to World Bank Group (2016): Migration and Remittances Factbook 2016 - Third Edition, Washington D.C.: World Bank Group, p. 17; World Bank Group (2016B): Remittance Prices Worldwide – An analysis of trends in costs of remittance services, Issue n. 19, September 2016, Washington D.C. : World Bank Group, p. 11

As evidenced by figure 4 the costs for remittances have been decreasing since 2008 from just under 10 % to 8.93 % in the third quarter of 2013 (cf. World Bank Group 2016, p. 11). In Q3 of 2016 the average cost rate for remittances was at 7.42 % (Ibid.). In contrast to that the total amount of remittances increased just like other international money transfers drastically since 2008. It had a little regress after the global financial crisis in 2008. Despite that the amount increased steadily compared to the decreasing costs.

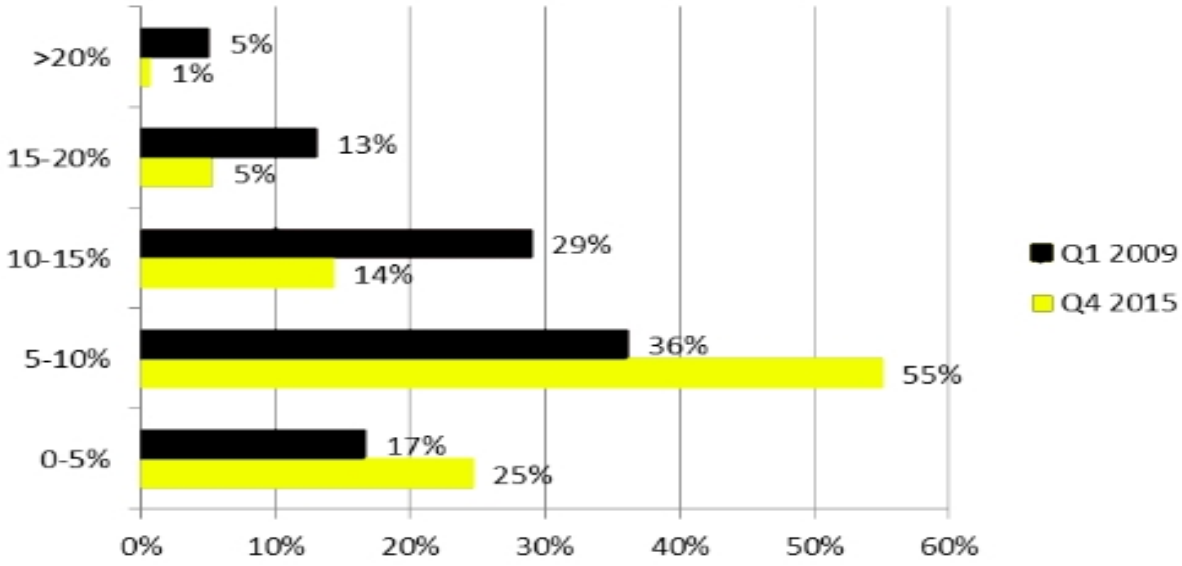

Figure 5: Distribution of Average Total Costs of Remittances
Source: World Bank Group (2015A): Remittance Prices Worldwide – An analysis of trends in costs of remittance services, p.3

The shifting of costs conveys when looking at the direct distribution of total average costs rates from the first quarter of 2009 and the last quarter 2015 in figure 5. Whereas in 2009 47 % of the cost rates for individual transfers have been above 10 % in 2015 only 20 % of the rates were located in this range. The cheaper rate ranges of 0 to 10% had an increment from 53 % to 80 %. This downturn displays how technical innovation and particularly competition in the formal and informal market cut prices in a relatively short amount of time (cf. for this passage World Bank Group 2015A, p. 3).
Technical innovation leads to more startups and companies that are entering the international transfer market with innovative business models and ideas for transfer platforms. So, the customers have a wider source to choose from. Usually these newcomers follow a differentiation strategy of low costs to enter the market. To remain competitive traditional remittance companies lower their prices to not to lose customers.
The World Bank states that South Asia can be transferred to from all over the world with the cost rate of 5.41 % in December 2015.

The most expensive region to send money to in 2016 is Sub-Saharan Africa with an average of 9.52 % (cf. World Bank Group 2016B, p. 1). Asia is a pioneer in development of financial technology. In addition to that Asian countries are the main remittance receiving countries. China, India and the Philippines received 165.8 billion US $ of remittances in 2015 (cf. World Bank Group 2016B, p. 12). This makes up a share of about 37,3 % of the total remittances worldwide. It makes the Asian market attractive, because it contains a big monetary potential. Also, the entrance is easier because of the technical affinity. In Africa there are more rural structures and there were only 2 African countries within the Top 30 remittance receiving countries in 2015 and only Nigeria as a Sub-Saharan country (Ibid.). The lack of agglomerations of remittance receivers and the missing financial structures make the African market unattractive for innovative competitors and MTOs may have monopolistic structures in some countries. But especially people in these poor, rural areas are reliant on low remittance costs.

One conspicuity of the average costs of sending money from the G8 states is that the costs in Russia have been and still are relatively low. With a cost rate declined from about 3.5 % in 2008 to 1.71 % in 2016[3]. Compared to that the average costs of the G8 states have fallen from over 10 % in 2008 to 6.97 % in 2016. This is the lowest level ever and thereby the first time that G8 remittances cost less than 7 % on average (Ibid., p.5).

The Gesellschaft für Technische Zusammenarbeit[4] in Germany published a study in 2007 where test transactions of 100 € via different transaction channels were made from Germany to Ghana, Serbia, Morocco and Vietnam. The total costs differed from 8.78 € to 34.20 € and included one outlier at 72.80 €.

[3]Thereby Russia already fulfills the UN's intended target of under 3 % remittances costs. In the Russian Federation, the commercial banks are not allowed to offer remittance services.

[4]GTZ was a precursor organization of Gesellschaft für Internationale Zusammenarbeit (GIZ). GTZ merged with the Deutsche Entwicklungsdienst and InWent. Together they formed GIZ in 2011. GIZ now is a governmental development cooperation organization of the Federal Republic of Germany.

Without considering the outlier, the average costs for remittances were at 17 % for these test transfers of 2007 (cf. Holmes, et. al. 2007, p. 13). This shows the high variation of the cost rate looking at different countries and different remittance channels. There are no newer studies that actually test the transfer channels and the costs for remittances decreased since 2007. The World Bank's corridor database calculates average and individual costs of money transfers from one country to another. This number is calculated from listed prices of formal remittance services like banks and MTOs in several countries. Referring to this calculation the average costs rate for remittances to these four countries in the third quarter of 2016 are in the region of 8.55 to 11.18 % for a transfer of 140 € (cf. World Bank Group 2016i).

The variation in prices can still be seen, looking at the average costs of the different transfer channels. Among the 3 most used formal, traditional remittance channels the cheapest one is the MTO transfer with 6.3 % followed by the post offices with 6.6 % and the more expensive banks with 11.2 % (cf. World Bank Group 2017, p. 12). The fixed exchange rates that banks are tied to restrict them from having competitive currency conversion. This increases the total costs. The form of how money is sent has a large impact on the costs that are demanded.

Online remittances with web-based services, that offer a sort of surrogate currency comprise the lowest average cost rate with 5.57 % (cf. World Bank Group 2015, p. 6). A person who sends cash pays an average of 6.54 % of the remitted amount as a fee. The transfers of book money from one account to another sum up to the average costs of 10.86 % (Ibid.). Since banks do account to account transfers and MTOs usually do cash transfers these numbers are nearly congruent with the banking and MTO cost rates.

All these data collections include average values calculated from formal remittance channels. Since informal channel transactions are widely intransparent there can only be made vague assumptions concerning costs for these kinds of transactions.

The different forms of inofficial MTOs and their services make it even more intransparent to evaluate costs. It's not obvious what amount of work and security standards advect these transactions. In general, higher remitted sums are preferred to be transferred via formal and smaller sums via informal channels. The fees for formal transfers tend to get lower the higher the remitted amount of money gets. In 2014 Kosse and Vermeulen commissioned by the ECB investigated the Dutch remittance market and the migrant's choices of remittance channels. Their regressed data approves that that large remittance sums are rather transferred via bank accounts and for smaller sums other channels are used. Further one of their findings is "that the use of informal channels is strongly driven by cost considerations. "(Kosse, et. al. 2014, p. 3).
There are actually no studies that evidently determined the pricing rates for informal remittance systems. What reliably can be said is that informal transactions are much cheaper than formal ones. Not least because informal remittance providers do not actually transfer the amount of money cross-border in every transaction but use an individual clearing system. So, there are no fees for a banking interface and there is no need of a currency exchange before arriving at the receiver. Further informal systems don't have to stick to governmental money regulation and capital controls.

4 Issues of Sending and Receiving Remittances

This chapter approaches the problems which can occur during the remittance process.These problems might occur on sender's as well as on receiver's side. Since there is a vast number of senders and receivers with individual wants and needs these problems or issues are very various. The utility of financial remittance products through transfer channels is dependent on these wants and needs. It's being attempted to cover all the important issues in sending and receiving that have an influence on the choice of the suitable transfer channel or financial product.

Furthermore, this chapter deals with the regulatory issues of remittance sending and receiving. This chapter deals with issues which have to be regarded in a governmental or global context. Here, the focus will lie on money laundering and terror financing which are the number one international issues concerning regulating remittances and according models for resolution will be introduced. Those resolutions are included because the regulatory issues are hardly dependent directly on the usage of alternative cash systems. The governmental tier is always interconnected. Resolutions for sender's and receiver's issues are not presented due to the focus of this paper on alternative transfer methods (follows in chapter 6).

4.1 Sender's Issues

The issues of senders of remittances differ in severity according to the sender's situation. Also, the sending and receiving locations play a big role when judging the urgency of an issue. Many of these issues can occur on the sides of sender and receiver. This section only addresses the issues that senders are struggling with, receiver's issues can will be discussed in the subsequent section (4.2).

As already mentioned, migrant's superior problem is struggling with costs for the remittance products of banks, formal and informal MTOs or private channels. Apart from high costs for remittance products, another problem migrants face is the uncertainty of not knowing the costs of a product at all (cf. Holmes et. al. 2007, p. 12). Sometimes, there might only been given a range in which the price settles. For some bank employees this international payments to other continent banks are no daily occurrence, so their consulting is more tenuous. Also, in cheaper transfer products hidden costs can crop out (ibid.). Fees can be subtracted from the remitted sum or marked up upon the remitted sum. Moreover, the fees are in some cases paid as a trade excluded from the actual transfer.

Senders have to keep that in mind when they want their counterpart to receive a precise sum. Another point is that the provider could use an unprofitable exchange rate and throuh which the remitted amount is reduced. A more detailed treatise of the remittance costs and the cost structures of different remittance channels can be found in chapter 3.2.

An exclusion criterion for migrants when it comes to choosing their financial products is the time it takes for the money to be transferred to the receiver in whatever way by any remittance channel. The lack of accurate time designations can force migrants to use other remittance channels with adverse attributes that don't fit their requirements. This takes effect when the sender wants the money to arrive at a certain closing date. This is not valid for most of the MTOs that are able to tell their clients precisely when the money transfer is going to be completed (cf. Holmes et. al. 2007, pp. 16-17). Banks seem to have massive problems in defining a duration for the money transfer. Furthermore, the test transfers of the GTZ in 2007 took longer than the transfer providers signalized in the survey upfront (Ibid).

The security of international money transfers in the remittance matter defines the worries of senders that the transferred money could get lost in the intermediary or it will be retained by non-serious providers. Since the major reputation of transfer providers happens via word-of-mouth recommendation, the issue of picking an insecure remittance channel is above all faced by new coming senders and people whose focal point is a low price that trades in the reliability and safety (cf. Profile Business Intelligence Ltd. 2005, p. 21).

The combination out of the three first mentioned issues: costs, duration and security can be regarded as the major influence on the choice of remittance senders when they - apart from having unrestricted access to all the different financial products and institutions in the market and when there is no information gradient between principal and agent (Macro International Inc. 2011, ii).

In a case of emergency, speed and security become much more important variables than costs (Ibid.).

The next hurdle for senders to pick a adequate transfer channel can be the availability of physical remittance providers in their area. When doing the transaction offline the sender is forced to stick with the banks and MTOs which have branches in a certain radius. "Often these remittances are picked up far from home, and families must add substantial travel costs and time to the already high transfer fees." (IFAD 2009, p. 2) Even informal remittance agents are not present in remote areas.

When providers offer their products online, senders can moreover have problems to reach them in a rural area with poor internet access. In most of the cases the sender is based in a more developed country and the receiver resides in a developing country. From this point of view this doesn't seem to be much of a sender's issue. But there are huge remittance corridors within Africa and intracontinental remittance transfers costs are far higher than transfers from outside the continent (cf. IFAD 2009, p. 3). The internet penetration in Africa in March 2017 was at 26.9 % (cf. Internet World Stats 2017). This is about half the penetration rate compared to the rest of the world and only 9.1 % of the worldwide internet users are located in Africa (Ibid.). Some African countries emerge to develop free WiFi in public buildings and on public transports, which helps online remittance senders.

When coming to bank branches the sender needs to open a bank account at this banking institution to transfer money to other countries. To use special remittance products from one bank the account has also to be opened. The costs for transfers to an account of the same bank are much lower than the costs for remitting to accounts of other banks. In 2011 the average costs for a same bank transfer were around 6 %, while other bank transfers would cost the customer about 15.5 % on average (cf. Cognizant 2012, p. 4). In general, banks have a positive reputation among migrants. But for some people it can become problematic to open a bank account, e.g. so-called illegal immigrants

without any personal documents who are not allowed to open an account or low-paid migrant workers who might not be able to pay the accounting fees or whom the bank simply wouldn't accept as clients (cf. Gesellschaft für Internationale Zusammenarbeit 2013, p. 14). Migrants without valid ID can use the service of formal MTOs to a certain extent, wich stick to the anti money laundering laws and have maximum transfer sums that will be sent without ID verification (cf. Profile Business Intelligence Ltd. 2005, p.42). People living and working in foreign countries without permission are forced to stay illegal even in their banking and payment habits.

Not only so-called illegal migrants want to send money in anonymity. Also migrants who are in possession of valid personal documents and a working licensemight wish to send money without being traced. The already mentioned online remittance channels require a certain technical knowledge to be activated by the potential sending person. Many migrants, especially low-skilled ones, don't know how to properly use a computer or smartphone or simply don't have the technical comprehension of how online money transfers work (TechnoServe 2016, p. 8). Many of these online money providers offer all their services virtually only. Transactions are processed by clicking the "send"- or "transfer" button. This leads to mistrust of many migrants in web applications that omit personal interactions. The contact between client and agent is in that case indispensable. For them, it is a strange action to virtually transfer money since most of their home countries are cash based countries. In addition to that, many of these online transfer services also require a bank account for sending money. Remittance senders have no influence on how the money they send is spent by the receiver in the end.

Many payments are intended to subsidize the health care costs of the family or education costs of the family's children (see chapter 2). But if there are other things urgently needed at some point the transferred money is not used for covering the educational costs. The very unawareness of the range of financial products on the market – formal and informal – can be a problem for a migrant, because they cannot draw on every

resource and might pick a product that contains disadvantages for them (cf. Profile Business Intelligence Ltd 2006, p. 28).

Moreover, niche products or products with a small set of marketing activities cannot acquire the suitable clientèle. On the other hand, some potential customers don't seem to find the fitting products in which they can trust and which they can use for a longer period. Some are definitely not satisfied with the current products of money transfer providers and there is a market for newly designed remittance products.

Regarding the rather financially undereducated migrants in contrast to the people in the formal and informal financial industry there can be the severity of asymmetric information. The financial service providers operating as the agent have an advance in knowledge of current costs of using intermediaries and of exchange rate prices. Further, they know what prices the senders are willing to pay as a fee for one transfer. The remittance sender who acts as the principal is trapped in the inferior position and price discrimination of similar customer groups is possible. Research shows that found that an increase in GDP in the sending country has a negative correlation with the difference of costs for a 200 $ and a 500 $ remittance payment. Migrants remitting 200 $ benefit more from an increasing GDP than those remitting 500 $ (Warthe-Anderson 2015, p. 17). This could be ascribed to price discrimination. When two groups of clients who reside and work in different countries with a similar salary level want to transfer money to the exact same country, the prices are probably assorted.

4.2 Receiver‘s Issues

Certain issues which remittance receivers face can have not only a negative impact on their own way to handle the money transfers, but might also have deep restricting consequences for the sender's choice of the remittance channel. This chapter investigates the issues that come up from the receiver's point of view.

First problem to name for receivers as for senders are the costs that occur when receiving remittances. In the receiver's sense the fees are charged when the receiver visits the agent or the transfer provider's office. Also a double markup is possible when two agents or branches want to be paid separately - one for sending, one for receiving. When the GTZ for example tested transfers, extra costs occured that had to be paid by the receiver (cf. cf. Holmes et. al. 2007, pp. 16). Furthermore, a criminal approach can lead to the receiver not being told that the transfer fee is already taken care of or the agent in place simply charges a second fee knowingly. In many countries with a rather weak currency performance and high inflation rates the amount of paper cash paid out can be very high. So simply speaking the receivers have to walk home alone a bag of money with them. Areas with high inflation tend to be not the safest surroundings and therefore the just received amount of remitted money can easily get stolen. In addition to that, there have been several reported cases where money was collected by another person than it was intended for. A study by Panda Security from 2008 investigated the security level of over 300 money transfer providers. Panda security is a development firm for security software for consumers and businesses. The outcome of the study unfolded a massive lack of security on businesses PCs of the transfer providers. Many of them were not only used for the actual money transfer but also for private chats and private downloads. Furthermore, the antivirus programs didn't contain the latest update (cf. Maceda 2012). This study leaves the remittance community in mistrust that not only the transferred sum can be picked up by the wrong person, but also the money can be seized by criminal hackers during the transaction process.

In many of the top remittance receiving countries there are strict capital controls. This means that the transferred money of one remittance transaction can be held by the financial authorities for a longer period of time. This means a huge time lag to the receiving clients. So, if they use a rather fast transfer service and probably pay a markup for the speed of the transaction, these control procedures can eliminate the certainty of

the fast transfer. Those capital controls were massively tightened after the terroristic attacks of 9/11 (cf. Todoroki, et. al. 2014, p. 1). Remittances in general were closer observed past that date.

When looking at technical knowledge of financial products for transfer,the receiver's side has also to be included. When one thinks of sending money home this - in most cases -contains the parents of the remittance sender. Elderly people tend to have much more problems with adopting to new technical procedures and operating with new software. In addition, the elderly people tend to mistrust new technological achievements in general. This limits the remittance sender in the choice of remittance channels. The internet and smartphone penetration in the receiving country plays a role when the sender wants to transfer the money via online or moblie remittance service. The receiving countries tend to have a lower penetration of both than the more developed sending countries. The people at place may not be able to receive the funds immediately and have to find places with better local internet connection. Moreover, they can't use the full features of the online providers like instant payment for purchased products. The receivers can furthermore struggle from being unbanked.

Certain financial products can't be considered when there is a bank account in need for the transfer process. Indonesia for example, is a rapidly economically evolving country whose nominal GDP increased by 56 per cent from about 6.5 trillion $ in 2010 to about 10 trillion $ in 2014 (cf. EYGM Ltd. 2015, p. 5). The banking account penetration in 2014 was at the level of 36 per cent. In comparison the average of the developing East Asian and Pacific countries is at 69 per cent. The world average banking account penetration sums up to 62 per cent (cf. Das Gupta et. al. 2015, p. 1). Indonesia's loan-to-GDP ratio is comparatively low with 37 per cent while other Asian countries like Thailand, South Korea or Malaysia have ratios around 150 to 180 per cent (Ibid.).

4.3 Regulatory Issues

As already discussed in chapter 3.1. informal remittance channels undertake a high amount of the total global remittances. Transfer sums sent via these channels can only be estimated. Also, the origin and destination cannot be tracked. The main causes for regulating remittances and making them more transparent are criminal activities like global terror funding and money laundering. The goal of the governmental authorities therefore is to minimize the market of informal remittances and regulate the formal remittance market as far as acts of crime can be abolished. Since many formal and informal remittance transfers are made in cash, the issue of using those channels to launder money is omnipresent. The market is obscure and the large amount of money transferred per day via remittance channels makes crime detection more difficult. Also, the worldwide reachability of especially formal MTOs makes the concept of remittance transfers a vehicle for criminal activities. The laundering can happen by structuring the transfers, which means that the lump sum of illicit money that should be laundered is split in several smaller sums. Those smaller sums are then sent by different transmitters to one or more persons in another country. In addition to that, more countries as stations for the money are a possibility to layer the illegal origin of the money. Structuring is a popular means to circumvent the 3,000 $ threshold for keeping records of money transactions that exists in the USA (Federal Money Laundering Regulation: Banking, Corporate and Securities). Particularly drug trafficking and human smuggling are examples for criminal acts which cause these money laundering processes. There have been 27 MTOs in the USA that were convicted by a task force for promoting and encouraging money laundering in 2007 (cf. for this passage GAO 2016, p. 35).

Formal and informal MTOs work mainly with agents who can be approached by costumers. These agents could ignore the valid anti money laundering laws or get paid for doing so. They also can get unwillingly included in the laundering process.

The customers themselves can also be a laundering risk when they use a fake identity for the transfer or straw men to veil the criminal actions or the actual transfer source. In some cases, sender's documents are not verifiable or a person receives remittances from many different areas of the world. These are signs for the investigators to intervene. Some geographic areas are stronger affected by laundering crimes through remittance transfers. This is mainly defined by the worldwide various anti money laundering laws. When there is no collaboration between authorities paired with various strictness in legislation, prosecution is fronted by complex barriers. Furthermore, the choice of products is essential for the money laundering risk: new technologies tend to offer the customers more anonymity and can also not be covered by valid money laundering laws (cf. For this passage GAO 2016, pp. 31 - 34).

Directly interconnected with the tightened laws against money laundering is the battle of suppressing terror financing. People who use veiled remittances to support terroristic activities in other countries follow the same strategies like money launderers. They prefer to use informal channels, structure their transfers or use fake personal documents. The first official "global investigation of the relationship between remittances and terrorism"(Mascarenhas et. al. 2013, p. 331) from 2013 analyzes domestic and international terroristic attacks in developed and developing countries (142 in total) in the interval of 1980 to 2010. Mascarenhas and Sandler use domestic terrorism incident coefficients from the Global Terrorism Database (GTD) and transnational terrorism incident coefficients from GTD and International Terrorism: Attributes of Terrorism Events (ITATE). One further transnational terrorist incident coefficient from ITATE is added which includes the terrorist attack's initiator. These four coefficients function as the dependent variable in each regression model. The lagged remittances variable is the important independent variable in the 4 regressed models. Further variables include the foreign direct investment per GDP, development aid per GDP, log of population and variables that consider if an interstate or internal war is happening.

Regional dummy variables are added to the model because some regions are affected by terrorism much more than others (cf. for this passage Mascarenhas et. al. 2013, pp. 337 - 338).[5] The result for all the independent lagged remittances variables is positive, which means that a rise of one per cent in received remittances is followed by an increase of terroristic attacks. There are certain arrangements and measures initiated by individual states and by trans-border cooperation to face the problems of money laundering and terror financing related to international money transfers.

The most important institution in this sense is the Financial Action Task Force which "is an independent inter-governmental body that develops and promotes policies to protect the global financial system against money laundering, terrorist financing and the financing of proliferation of weapons of mass destruction."(FATF 2013, i). FATF published references that advise governmental boards to license and register money transfer operators. Especially informal MTOs are targeted to register by the countries that adapted the policy advise from the FATF. Moreover, the money transferring providers need to attest that the customers have a valid ID or passport (cf. International Monetary Fund 2009, p. 16). The providers are forced to keep record of the transaction history. In this way, every transaction by a checked customer is electronically recorded and can be passed to the authorities if needed (Ibid.). If there is any doubt in the legality or reliability of a transaction, the provider has to report this suspect transaction to the authorities directly (Ibid.). The Remittance Work Group suggests to combine the customer ID with other official documents which they have to bring to identify (Profile Business Intelligence Ltd. 2006, p. 15). Further, they want the regulating advisories to work closer together and develop new guidelines and trainings to detect fraud (Ibid.).

[5] A detailed explanation of the regression's methodology and dataset can be found in Mascarenhas, R., Sandler, T. (2013): Remittances and Terrorism – A global Analysis, in Defense and Peace Economics on pages 335 – 339, available at:
http://create.usc.edu/sites/default/files/publications//remittancesandterrorism-aglobalanalysis.pdf

Another problem receiving national economies are facing is the threat of the Dutch disease. By importing forex, converting it into local currency and internally spending it the local currency is appreciated. Since the local currency is more valuable, the exported goods are getting more expensive. Importing countries have to pay more money for the same product or service so the external demand will decrease (cf. Development Centre of the OECD 2007, p. 87). Additional regulatory problems are the tax losses that individual countries face and that are accelerated by people using informal remittance channels. Data collection transparency should be the issue when tightening the regulations of international money transfer.

5 Alternative remittance channels

All the by now analyzed transfer channels have in common that they use the concept of fiat money and different currencies as their functional basis either in cash or as deposit money. Since the 2010s there is an intensified search for alternatives to the monetary and global financial system. This development also shapes an alternative remittance market with own channels that are somewhat still dependent from actual fiat money but refuse to use real currencies for the actual value transfer process. Two types of these remittance channels will be analyzed in this chapter. Section 5.1 deals with mobile cash systems that enable the cashless money transfer via mobile telephones. It will be focused on the most reputable player and pioneer in this business field M-Pesa. In the second section the Bitcoin based business models of young companies and startups are examined. The focus will lie on the startup Bitpesa which is a Bitcoin equivalent to M-Pesa. The present use of both channel types in remittances will be evaluated after describing the functional mechanisms. Both types will be compared to the traditional remittance channels concerning transfer fees.

Other practical examples of alternative startups will be added. Further the general concept of the cash system Bitcoin will be previewed to be able to understand its usage in the international money transferring process.

5.1 Mobile Cash Systems

What are mobile cash systems? It can be any sort of payment system that allows the user to send money from a mobile device to another user. Further these systems are usually used to pay for commodities and services. Since an fiat version of online cash systems is already covered in chapter 3.2 with PayPal, WorldRemit and xoom an alternative to that is the use of mobile technologies only. No internet connection is needed, money is sent by using the communications system and net technologies of telecom companies. Most notably these mobile only cash systems entered the African market in the last few years with a great success.

At the present time, there are more mobile devices than people in the world. In 2015 there were 5.8 billion people using a mobile device. This equals a penetration rate of 80 % (cf. Radicati 2014, p. 2). In Africa the mobile phone penetration was increasing rapidly over the last years and add up to a continental penetration of 67 % (cf. Adepetun 2015). Kenya has one of the fastest growing mobile device penetration rates worldwide with total rate of over 90 % in 2016 (cf. Kemibaro 2016). Thereby it is in top position of African countries and far above average. On the Kenyan market the mobile communication provider Safaricom is market leader with a market share of about 70 % (cf. Kenyan Wall Street 2017).

In 2007 Safaricom introduced the mobile money transfer and payment system M-Pesa to the Kenyan market in cooperation with Vodafone. M-Pesa inheres the thought of giving and receiving microcredits both private to private and corporate to private.

The developers wanted to " [...] allow the customer to make payments as conveniently and simply as they do when they buy an airtime top-up [...]" (Hughes, et. al. 2007, p. 68). M-Pesa virtual money is referred to as airtime. The system uses the SMS technology for sending monetary payments between the cellphones of customers. Moreover, vendors are accepting the M-Pesa payment system for purchasing goods in stores. The individual current account is saved on the respective user's mobile devices (Jack, et. al. 2010, p. 5). This account is "[...] accessible through a SIM card-resident application on the mobile phone." (Mas et. al. 2010, p. 1). Every transfer is tracked and verified by secure SMS. Single transfers are capped at 500 US $. Every M-Pesa user can approach agents in different stores and buy electronically credited money with their cash (Ibid., p.1). Airtime can freely be transferred to other users and non-users. It also can be withdrawn from the mobile M-Pesa account for a fee of 1$ for a 100$ withdrawal (Jack, et. al. 2010, p.6). M-Pesa launched in Kenya but quickly spread to Tanzania, Mozambique, the Democratic Republic of Congo, Lesotho, Ghana and Egypt. It also entered the Asian market with India in 2013 and the European market with Romania (2014) and Albania (2015) (EservGlobal 2016, p. 2). In Kenya there were about 19 million active M-Pesa users in 2016. This means that 41.3 % of Kenya's whole population possessing a mobile device use the service of M-Pesa and operate a mobile wallet. The worldwide count of people using M-Pesa reached 25 million in the year 2016 (Ochieng 2016).

The fee system of M-Pesa for airtime transactions differentiates between transfers to M-Pesa users and to unregistered users. Moreover, the amount charged per transaction is stepped and dependent from the transferred amount. A transfer up to 100 Kenyan Shilling (which equals less than 1 US $) is free of charge when transferred to other M-Pesa users. Then between 100 and 20,000 KSH (0.96 – 193 US $) of transfer sum the client has to pay a fee from 11 to 100 KSH (0.11 – 0.97 US $).

From 20,000 to 70,000 KSH (193 – 675 US $), which is the maximum transfer sum, a transfer to another M-Pesa client costs 110 KSH (1.06 US $). When calculating with the smallest possible transfer amount the costs for a transfer are 11 %. Taking the highest possible amount for one transfer the costs reach the total of 0.15 %. A transfer of 200 US $ would cost 110 KSH, which equals a pricing rate 0.53 %. The transfer to unregistered persons who are not part of the M-Pesa network follows slightly stricter rules and fee policies. The possible transfer range starts at 101 KSH and is capped at 35,000 KSH, due to the KYC guidelines of the Kenyan Central Bank. The unregistered cost structure is also stepped. For a transfer of 35,000 KSH Safaricom charges a 303 KSH fee which equals a cost rate of 0.87 %. A transfer of 200 US $ with M-Pesa to a unregistered user costs 303 KSH. That equals a pricing rate of 1.46 %.

Withdrawals can be made via a M-Pesa agent, an extra M-Pesa ATM or cooperating bank ATMs. The customer will be paid out in Kenyan Shilling. The price for one withdrawal depends on the paid-out amount and ranges from 10 to 330 KSH. A withdrawal of 200 US $ from a M-Pesa agent would cost 187 KSH and equals a pricing rate of about 0.90 % (cf. for this passage Safaricom 2017). So, if the receiver of the transferred sum in Kenya wants to spend the money in cash, the fees for the transfer and the withdrawal have to be aggregated. A transfer plus withdrawal via agent of 200 US $ would add up to a total remittance fee of about 1.43 % for a registered user and about 2.36 % for a unregistered user. Compared to that the World Bank remittance database points out a total average pricing rate of 8.05 % for remittances of 200 $ from the USA to Kenya. The cheapest options as per World Bank database would be WorldRemit with a total cost rate of 3.14 %, Ria with 5.35 % and Western Union with 6.04 % (cf. World Bank Group 2017i). Due to its relatively low transfer fees and simple technical handling M-Pesa is more and more inquired for national and international remittances. In 2015 Safaricom enabled the international money transfer feature for M-Pesa clients all over the world.

Remittance providers begin to implicate M-Pesa and other mobile payment systems as a receiving channel in their operating platforms. Best practice example is WorldRemit which allows their clients to send mobile credits to people operating a M-Pesa wallet. As already mentioned in chapter 3.1 WorldRemit is the market leader of transfer applications that enable transactions to mobile wallets, "with 30 services in 20+ countries across Europe, Africa, Asia and the Pacific" (cf. Worldremit 2016).

A partnership with Western Union enables Kenyan people to receive money via M-Pesa from 45 countries all over the world like Canada, the UK and the USA (cf. Ntara 2015, p.1). This cooperation links a traditional, formal remittance channel on sender's side with an alternative, formal remittance channel on receiver's side. The partnership allows the client to remit directly to a mobile M-Pesa wallet.

What can be seen as the greatest advantage of M-Pesa in a remittance context is the fact that the whole transfer and clearing system is organized similar to the networks of informal transfer channels. Clients can send the airtime freely to friends or family and don't even need an agent for the transferring process. The agent is solely functioning as a currency exchanger from real currency into airtime and the other way around. Since there is no real currency involved in the transfer process the airtime can float freely. The costs and the effort for this kind of transfer are marginal. Payments are individually made by users so the only effort made by Safaricom is the clearing process and customer service. This is an upside compared to the traditional informal system, because the agent is not involved in the transaction process. Transactions are made individually and are completed in a short amount of time. Also the user is not geographically bound to any local institution. The money or airtime can be transferred via SMS from wherever a cellular network is accessible (cf. Herzog, et. al. 201, p.4). Safaricom pays fixed costs for maintaining the cellular network anyways. The variable costs for the secure SMS transfer are neglectable.

This indicates that the extra payment service of Safaricom can be run with almost no more additional costs apart from staff costs. Transfers can happen nearly in real-time. The settlement of deposits of merchants that offer payment via M-Pesa is automatized as a service by Safaricom. This service enables the merchants to settle their accounts themselves and get the money almost immediately (Communications Africa 2015). Another way to send remittances internationally is the inpayment from a foreign country directly to the receiver's mobile wallet. Thereby the necessity of a transfer is dismissed. Moreover, a transfer from a bank account to M-Pesa wallet is possible via USSD code[6] (Safaricom 2017A).

5.2 Bitcoin based Business Models

Bitcoin is referred to as cryptocurrency or virtual currency in media and science. It is only existent in bits and bytes. There is no physical currency involved in this payment system. The electronic cash system of Bitcoin was developed in 2008 as a response to the global financial crisis (cf. Sixt 2017, p. 29). It should define a new form of money that is independent from central banks and the global financial system. To own Bitcoin they can either be bought on free Bitcoin marketplaces or earned with the processing power of personal computers by mining (cf. Gantz 2014, p. 2). Every transaction that is made in Bitcoin has to be verified to prevent double spending of a single Bitcoin (cf. Gantz 2014, p. 16). This verification can be achieved by a computer that solves complex mathematical problems. Once the problem is solved the transaction is verified and enclosed in one data block to a decentral saved data record, the "blockchain" (cf. Sixt 2017, p. 30). It contains every single made transaction and by this sets the status of how much every single Bitcoin user owns. The complexity of the mathematical problems is adjusted depending on how quick these get solved.

[6]Unstructured Supplementary Service Data – Code consistent of numbers, # and * on the mobile keyboard. A certain sequence functions as control command to arrange a bank-to-wallet transfer.

Approximately every 10 minutes a new block is added to the blockchain (cf. Sixt 2017, p. 41). A fixed amount of Bitcoin is mined and thereby issued to the users whose computers were able to solve the math problem. Every mined or transferred Bitcoin changes the account balance of the individual users. The current amount of Bitcoin available is saved in the user's wallet. The wallet contains of a public and a private key. The public key is used to receive Bitcoins and is the equivalent of a banking account number. The private key authorizes the user to transfer and that the user is in funds (cf. for this passage Gantz 2014, pp. 1-2). The whole Bitcoin system is organized decentral by the users and is thereby independent from the banking system and from states boundaries. That means that the Blockchain is saved on user's personal computers. The total amount of Bitcoin is capped at 21 million units, the algorithm refuses to issue more Bitcoins (cf. Sixt 2017, p. 41). By that an inflation is prevented, because nobody can artificially raise the money supply. There is no official exchange rate. The Bitcoin price is determined by supply and demand of its users. Since the issued amount of mined Bitcoin per block is decreasing by half every 210,000 verified blocks it rather has deflationary tendencies (Ibid.). In the beginning of 2017 Bitcoin got greater attention by the mainstream media, because the price index increased to over 1,000 $ per Bitcoin for the second time. Bitcoin is no actual currency in classical sense because the three main monetary functions are not complied. Using Bitcoin as a unit of account is very difficult due to its 8 decimal places and odd pricing numbers. Further a currency should function as a medium of exchange and by that should be a commonly accepted payment method. The number of merchants accepting Bitcoin is increasing fast, but it's still a long way to acceptance by the society. Lastly, the store of value in Bitcoin is rather insecure, because the price is very volatile (cf. for this passage Lo, et.al. 2014, pp. 3 - 12). Nevertheless, by this definition, hyperinflational real currencies couldn't be defined as currencies either, because storing value is not possible in the long run.
There are mainly four ways in that Bitcoin remittances can be organized.

First of all, a Bitcoin user can privately send Bitcoin from their wallet to the receiving wallet. All this happens without a remittance service provider and its safety precaution. Another way is to use a service provider that manages the customer's transfer process in Bitcoin. A third alternative is the provider that collects your real currency, uses Bitcoin as a transfer currency and pays the receiver in another or the same real currency. The fourth method for the provider is to use Bitcoin as a settlement currency and abstain from processing every transaction.

The Bitcoin remittance startup market is concentrated mostly in Asia. In some Asian countries the living conditions in a cultural and also a technological context differ very much from the rural areas to the big cities. Furthermore, Asia has the highest concentration of sophisticated metropolises in the world. 18 of the 31 cities with over 10 million inhabitants are located in Asia (United Nations 2016B, p. 4). Some of the Asian countries like Indonesia, the Philippines and Malaysia are booming and far from the stigmatized "development status". There are also countries like Singapore, Hong Kong or Taiwan with some of the worlds' highest gross domestic products per capita, which play a major role in the global economy, especially in the business sector. Also, rich Asian oil exporting nations like Qatar and Kuwait are hosts for millions of remittance workers. As an example, for a Bitcoin remittance business strategy will not function one of the many Asian remittance startups but Bitpesa, an African remittance startup that uses Bitcoin for international money transfers.

Bitpesa is picked because it connects the use of both technologies, Bitcoin and M-Pesa, in the transaction process. In Africa it is very difficult to establish Bitcoin at all and also in connection with remittances. The technological requirements are only partly available, in rural areas they are simply nonexistent. That correlates directly with the low technical knowledge many African citizens have. So the word Bitcoin only pops up at the agenda of specialized innovators and computer experts in Africa.

To get started with using Bitpesa as a remittance provider the client has to trade their local fiat currency into Bitcoin. They can do so by buying these at one of the numerous Bitcoin exchange online platforms or buy it directly from Bitpesa. Bitbond, a Bitcoin lending platform, has a partnership with Bitpesa, which allows them to access Bitcoin fast. The Bitcoins can be sent from over 85 countries in the world to Kenya, Tanzania, Uganda and Nigeria.

After receiving the Bitcoin in an African country Bitpesa converts Bitcoin into the local currency. After that the money can be paid out to the receiver either in cash or sent to their mobile M-Pesa wallet. For receiving the money as M-Pesa airtime a second conversion is mandatory. Bitpesa charges a consistent fee of 3 % per transfer (cf. Maxim 2015).

Another interesting fintech startup in Kenya was Kipochi, which, just like Bitpesa, was founded in 2013. It was a platform also directly connected to M-Pesa. Kipochi adapted the M-Pesa wallet service and made it possible for customers to buy and sell Bitcoin via SMS. A conversion in local currency was not necessary at any point. Under unclear circumstances Kipochi disappeared in 2014 without a trace (cf. for this passage Buenaventura, p. 29). In 2016 Pelle Braendgaard, the founder of Kipochi wrote about the disappearance in his financial blog StakeVentures. According to Braendgaard 2 or 3 weeks after the M-Pesa integration the M-Pesa and Kipochi connection was shut down by Kopo Kopo. This is the merchant provider that held the connection between M-Pesa and Kipochi. There were rumors about Vodafone exclusively being responsible for the shutdown of the connection (cf. for this passage Braendgaard 2016). Also the Kenyan Central Bank was interested in Kipochi's business. Braendgaard had to set up a meeting where to reveal their goals and interests and tell the Central Bank's employees what Bitcoin actually was. After the meeting Kipochi was allowed to continue their business when cooperating with a telecom provider or financial institution (cf. for this passage Buenaventura, p. 29).

The company OKLink, which is a subsidiary of OKCoin from Hong Kong and a settlement network for Bitcoin remittance platforms, announced in 2016 that they will undertake the transfer costs for Bitcoin remittances. All in all, OKLink wants to spend 100,000 US $ for international transfer costs of customers. The costs will be balanced for every transaction of under 500 US $, so that particularly senders of small sums will be supported. Not only Bitpesa is involved in the settlement network and the subsidizing deal but also most of the important players in the Bitcoin remittance market, like Coins.ph, Rebit or Coinplug. The costs for Bitcoin remittances range from 0.6 to 1.6 % and are thereby well below the costs of traditional remittance channels (cf. for this passage Bergmann 2016).

6 Influence of alternative remittance channels on the market

For finding out what influence alternative remittance channels like Bitcoin and mobile cash systems have on the entire remittance market it has to be analyzed to what extent people are willing to use these alternative channels. The usage statistics of Bitcoin in developing countries and the market power of M-Pesa in Africa is reviewed with the help of 2 studies. Further it is evaluated if a market demarcation can define the alternative remittance market and all its potential customers. The effect of alternative channels on the whole market is analyzed in chapter 6.2. The questions here are particularly what impact there is and how traditional channels are influenced by the new businesses already. Further it needs to be asked what influence there could be in the future and how traditional channels are likely to change by the impact of alternative channels.

The problems and issues that were highlighted in the analysis in chapter 4 are compared to the strength and disadvantages that the alternative channels bring with them. Can alternative channels improve the transfer conditions for senders and receivers of remittances and can they have a positive impact on regulatory obstacles?

6.1 Alternative Market

In his paper "Bitcoin: Implications for the Developing World" Makari Krause from Claremont KcKenna College conducted an empirical analysis on the use of Bitcoin in different countries to avoid extractive governments. Therefore, a regression is purpose-built for 21 countries. The dependent variable of Bitcoin usage is regressed against the financial openness of a country, the 45-year average openness, the inflation, the 35-year inflation, the internet penetration and the percentage of population banked in the country. The dependent variable is regressed 5 times against different combinations of independent variables. The controlling variables are GDP and population. To measure the usage data of a decentralized currency with anonymous transfers seems difficult. An alternative to observing the number of transfers is the number of Bitcoin client downloads in the certain countries. In addition to that, the amount of local currencies into Bitcoin is tracked by the website LocalBitcoin and is involved in the data for Bitcoin usage. The Chinn-Ito financial openness index was developed as a measure for the magnitude of regulation, capital controls and financial restrictions. The financial openness indicator condenses "multiple exchange rates, restrictions on current account transactions, and the requirement of surrender of export proceeds. " (Krause 2016, p. 25) As a result of the first two regressions with the highest significance for the given regressors the usage of Bitcoin in 2015 increases by 44.48 % respectively 45.95 % when the inflation rate increases by 1 per cent.

This large increase arises also from the relatively low number of people using Bitcoin generally, but also states that people who feel insecure with their local fiat currency tend to try alternative currency as a method for saving and transferring. Financial openness only has a significance of 10% but still leads to a decrease of 216 % in Bitcoin usage with a raise of 1 %. It needs to be minded that the coefficient in the observed countries ranges between -1.89 and 2.39. So, an increase of 1 per cent has to be a huge intervention in financial regulation in the country. Long term inflation and financial openness are neglectable since their significance level is very low. An increase of 1 % in percentage of banked population has a negative effect of 8.65 % on Bitcoin usage. Like to be expected the internet penetration of a country is highly significant and correlates positively with the Bitcoin usage. A one per cent point increase in internet penetration entails a rise in Bitcoin usage of 28.79 %. All in all, the Bitcoin adaption tends to be higher in countries with a higher amount of unbanked population, more restrictions and financial regulations, a high internet penetration and higher inflation rates (cf. for this passage Krause 2016, pp. 23 - 27). Developing countries, especially African countries, which are highly dependent from remittances have traditionally many unbanked people and financial regulations, a high inflation rate. This makes these countries the perfect qualifier for Bitcoin adoption. The internet penetration is traditionally lower than in the rest of the world, but is constantly increasing. So, the market potential in Africa is potentially high, but the lack of knowledge, the low internet penetration and the unawareness of new technologies let Bitcoin spread only on a slow level.

There is no doubt that the adaption of M-Pesa as a payment and saving method is an absolute success story in Kenya. And also, it spreads across the borders to many African countries, but also to Europe and Asia. The business implications of M-Pesa in these other countries are rather small, but it seems like they also have an impact on the local financial markets. But it's not that engaging as it is in Kenya.

For example, 14 months after the introduction of M-Pesa in Kenya there were 2.7 million registered users and 3,000 registered agents. In Tanzania after 14 month there were only 280,000 registered users and 930 registered agents, although Tanzania has more inhabitants than Kenya (cf. International Finance Corporation 2010A, p. 2). M-Paisa, what the client is called in Afghanistan, was commercially launched in 2008. Other than in Kenya M-Paisa was primary founded to be a microfinancing client. Afghanistan shows that in countries with a highly competitive telecommunication market and low technology adaption there can be many hurdles in setting up a mobile cash system (International Finance Corporation 2010, pp. 1-3). The success of 1.2 million subscribers in 2015 shows that even on a tough market like this a mobile money establishment is possible (Runde 2015). That a mobile cash system is beneficial for domestic money transfers and especially domestic remittances can be seen in Kenya, which's rural population is dependent from remittances of relatives in the urban areas. M-Pesa has a balancing and redistributive effect on Kenya's economy. In 2014 there were only about 4 % of the remittances received with M-Pesa from foreign countries (Ntara 2015, p. 73). Due to the uncertainty of the development of the global mobile money market it is important at this point to make implications for the international money transfer.
Caroline Ntara from Kenya Methodist University implemented an analysis on the use of M-Pesa in international transactions. The study aims to investigate the factors that have an impact on using M-Pesa for international transfers. It also should evaluate the present success in comparison to existing financial services. The first part of the study analyzes the competitiveness of M-Pesa against Kenya's major financial institutions in processing international monetary transactions. Besides M-Pesa the transfer data of nine banks and Western Union were evaluated from January to August 2014. The two banks with the largest transfer sums have been the Equity Bank (10.3 billion KSH) and the Co-Operative Bank (8.7 billion KSH). Western Union processed a global transfer sum of 4.7 billion KSH.

M-Pesa, with the smallest sum within the observed institutions, transferred 3.39 billion KSH, which was still more than 34 other Kenyan banks. When looking at the 11 biggest players in international transfers in Kenya, M-Pesa has a market share of 4.94 % in this partial market. It can be assumed that since August 2014 the amount of money transferred internationally via M-Pesa increased faster than via the traditional channels, because since then it further manifested as a tedious payment system in Kenya (cf. for this passage Ntara 2015, p. 77).

For the second part of the study 35 employees of Safaricom responded to Ntara's questionnaires concerning the influential factors. The relevant questions in this sense are concerning the influence on the economic development of Kenya. 88.89 % of the sample strongly agreed that M-Pesa can facilitate easier movement of money across the globe. 11.11 % stayed neutral on this point. Alongside this 77.78 % of the employees strongly agreed with the allegation that the Kenyan population can benefit from exchange earnings via M-Pesa. 11.11 % agree on this point and 11.11 % disagree (cf. for this passage Ntara 2015, p. 79).

A remittance market demarcation for Bitcoin or mobile money users is not an easy proposition. Most users are not driven to use a certain remittance method like this because they want to support the business model, but because these methods offer a cheaper price and an easy handling. The SSNIP test can be a means for finding out which are the competitive products. Potentially every global financial product can play this competitor role for alternative channels and the other way around. The SSNIP test asks if a small but permanent increase in the product's price (of about 5 %) makes the customers use another competitive product. The test can also be reverted into a steady price for a product and other competitors lowering their prices permanently by 5 %. Since the price is the main criterion when picking a transfer channel the cross-price elasticity of demand can be assumed to be given for a very large number of product combinations.

The remittance products are traditionally very heterogeneous, namely they offer a transfer of money from one country to another. In areas with a big supply of transfer channels and many offering companies the change rate can potentially assumed to be high. Also, the calculation of the market potential of both business models can only be assumed theoretically.

6.2 Direct and indirect Impact

First and foremost, it must be clear that only about 5 % of international remittances were sent online in the year 2016 (Sreda Life 2016, p. 166). This is only a small share, but still equals about 22.5 billion US $. It can be assumed that the amount will increase fast within the next years, due to the global technological progress and the technological adaption in developing countries. In her study on M-Pesa in international transactions Ntara also included competition issues of the market in- and outside of Kenya. The first statement, that "Banks and other financial institutions outside Kenya poses a threat to the use of M-Pesa in international transactions "(Ntara 2015, p. 78) and the second statement that „M-Pesa is threatened by similar forms of mobile money in other countries" (Ntara 2015, p. 78) were both with 88.89 % agreed or strongly agreed to. In both cases 11.11 % of the employees stayed neutral on the given issue and there was no disagreement. It can be seen that M-Pesa is aware of competitors internationally and doesn't see itself as established as they are in the national market (cf. for this passage Ntara 2015, p. 78). The other way around, the statement about other financial institutions across the border being threatened by the dominance of M-Pesa still got agreed to or strongly agreed to by 55.55 % of those polled. 22.22% stayed neutral on the statement and 22.22 % disagreed (Ibid.). So, M-Pesa employees are also aware of their dominance in the Kenyan market, which can have a leverage effect for the international transfer business.

Furthermore, it implicates that other financial institutions outside of Kenya are influenced by the dominance of M-Pesa in the local Kenyan market, but also in the other African markets in which M-Pesa is present and in the global market.

One strength of Bitcoin in the remittance context is its potential and already established use as an intermediary currency and further a settlement currency. The advantages of a Bitcoin transaction being complete in about 10 minutes and the very small transfer fee qualify Bitcoin to work as a intermediary between bigger fiat currencies. For this kind of intermediary currency Brett Scott claims that a liquid market must be given and Bitcoin should be attainable and resalable in a short period of time for a relatively stable price (cf. Scott 2016, p. 5). When a transfer company has agencies in many different countries money for the local customers can be paid out immediately or transferred via the local banking system with small fees. The agency in the country from the sender's country is by that in debt at the receiving agency. All transactions made like this can be bundled and the surplus or deficit needs to be balanced at a certain time. Bitcoin can function as this settlement currency because also the high settlement sum will not cause higher transaction costs, since the transfer fees are calculated by file size not value transferred (cf. Caffyn 2015). As already mentioned, transferring money physically is not efficient. A settlement system with local payout channels is much faster and cheaper. Nearly all remittance Bitcoin startups and M-Pesa use these kinds of clearing system. This makes them superior over banks and competitive against MTOs and informal remittance providers that use similar systems, whereas the MTO system is much more complicated, inefficient and dependent on banks. Bitcoin can circumvent the account-to-account transfer process by processing the transfer decentralized within 10 minutes. After 10 minutes the conversion into a local currency can be made, this fastens the process. Bitcoin is open source and can easily be adapted by startups and emerging small businesses.

As Bitcoin and M-Pesa are a serious threat for informal remittance channels in pricing and transaction speed these alternative channels have the chance to acquire customers who normally rely on informality. Further Bitcoin remittance startups guarantee for the paid-in amount also being paid-out. Furthermore, their transaction politics are very transparent. Customers know their remittances to be in safe keeping. So, the conditions are better using a Bitcoin startup than to rely on informal channels where the possibility of third persons picking up the money persists and it is not guaranteed to get a compensation for a loss of money. Bitcoin is practical for these kind of settlement processes, but it is dependent from local fiat currency which is the dominant payment method in all receiving countries (cf. Buenaventura 2017, p. 19). This brings up the issue with Bitcoin having an extremely instable exchange rate.

Bitcoin was developed with a deflationary background and now that there are many speculators that hoard their Bitcoin trying to scale up the price it makes Bitcoin very volatile. Since most Bitcoin startups already have local cash deposits at the payout channels in the receiving countries, the amount of Bitcoin they receive centrally can be converted immediately after the receipt. When the remittance payment is only initiated, the funds are already in the distribution process to the receiver. The Bitcoin amount is converted immediately to settle the deficit in local currency at the payout channel. So, the Bitcoin price rate is only a minor part of the Bitcoin remittance system (cf. For this passage Buenaventura 2017, pp. 18 - 20). The currencies apart from the top global currencies are not traded freely on the international market. This makes an integration in a Bitcoin exchange model very difficult. The advantage is that Bitcoin startups have liquidity in local currency the Bitcoin payments don't need to be converted. However, they can be converted if there is a suitable offer in the free trading market. If there are only inferior offers and no cash reserves this can also be a disadvantage.

Since Bitcoin is a deflationary and volatile "currency" and the price has been permanently increasing since its introduction in the long term better conversion conditions can be expected. This can also be very risky for startups that aren't that financially stable. The in chapter 5.2 introduced company OK Link is a service for connecting Bitcoin remittance startups that settles balances via Bitcoin.

Therefore, OK Link works as an intermediary between services and connects these to each other, similar as the SWIFT network for traditional banks. If one person wants to remit 100 € via an European Bitcoin startup to Vietnam and there is no connection between the European and any Vietnamese recipient company, OKLink is able to establish this connection. This is possible because the European startup and OKLink have access to a multi signature Bitcoin wallet.

This means the European startup pays into this wallet, OK Link is performing the settlement and the Vietnamese startup is safe to pay out Vietnamese Dollars to the receiver (cf. for this passage Buenaventura 2017, p. 42). The fees that OKLink set after expiration of the 100,000,000 $ free of charge are rather small. For this 100 € payment to Vietnam a fee of 0.81 € is included (cf. OKLink 2017).

Scott reports in his paper on social finance through cryptocurrencies, that

"Bitcoin also has potential to facilitate small-scale international commerce. Local merchants in poorer countries may struggle to access international payments systems to sell their goods abroad. For example, a rural crafts cooperative from Zimbabwe might struggle to set up a website with an integrated credit card payments system, but getting a Bitcoin address might enable them to sell products in exchange for Bitcoin tokens, thereby avoiding traditional e-commerce systems (which often involve having to set up a merchant account with a formal bank). Provided that a market exists to exchange such bitcoins received in trade back into a usable local currency, this could prove useful. For example, imagine a scenario where a small-scale independent producer of sustainable cocoa butter products sold them to US clients in exchange for Bitcoin tokens that

were then redeemed for local - or foreign - currency on a Bitcoin exchange. Likewise, a small-scale non-governmental organization can easily set up to receive Bitcoin tokens as donations. " (Scott 2016, p. 5)

Bitspark and Rebit are examples of startups that established a cash-in cash-out Bitcoin remittance channel. And there are many intermediaries connecting traditional with alternative market. For example, WorldRemit, Transferwise and other digital transfer channels offer bank to M-Pesa transfers, so that customers will directly receive the converted fiat money amount in airtime.

A case study on the adoption of Bitcoin in Kenya with a focus on Bitpesa, published by the University of Nairobi in 2014, found out that Bitpesa actually reduces the costs for international money transfer.

Therefore, the costs of Bitcoin, Western Union and Paypal transfers were analyzed and compared. Especially in the micro remittance sector of 2 to 10 £ a use of PayPal and Western Union doesn't make sense for the customer, as the costs for these types of remittances are the same as the amount sent in some cases. Bitcoin and companies like Bitpesa make the sending of this microremittances possible (cf. for this passage Njuguna 2014, p. 22).

Do Bitcoin and M-Pesa have a direct influence on the costs of sending remittances? Yes, they are part of the competition. Thereby they positively influence the already decreasing average costs of remittances, cause the alternative channels are much cheaper than the mean. The sunken mean price and the direct competition is acknowledged by the competing transfer providers and advects their pricing strategies. Competition is the main factor for remittance costs decreasing by 2.5 % from 2008 to 2016 (cf. World Bank Group 2016, p. 11).

As the study "What explains the cost of remittances? " found out the more competition among providers in remittance corridors persists the lower the transaction costs tend to be (cf. Beck, et. al. 2009, p. 17).

Moreover, a higher frequency of the banking network in the receiving country leads to higher remittance costs (Ibid.). There are certain sending corridors without real competition to rural areas in Africa only MTOs will offer their service of transferring. This means that the fees are on a corresponding high level. Alternative sending channels with digital money that can be used for direct payment are able to compete with the local MTO services. Many of the Bitcoin remittance startups are targeting numerous corridors at once and also providing an alternative receiving channel besides banks. This new global competition initiated by startups tackles the average remittance prices in all remittance channels as they cover all and keep expanding their sending and receiving destinations. Mobile operators offer a pricing rate of 2.87 % on average what makes them more than half as expensive than their nearest competitors (World Bank 2017, p. 12). Especially in the high price Kenyan market, where some remitters have to pay fees of 17 % the fixed price rate of 3 % of BitPesa and low priced transfers via M-Pesa make a real difference (cf. Heuler 2015).

All in all, there is a huge opportunity for new companies, new technologies and new business models, because the whole financial service market is in transition. Numerous fintechs are challenging the traditional financial institutes. Traditional companies like Western Union and Money Gram launched their online money transfer clients by now. The amount of online transactions worldwide increased by more than 80 % from 2011 (21.3 billion) to 2015 (38.5 billion) (Statista 2017). This gives an idea of how vibrant the online payment market is and how many people are shifting to make payments and transactions online. So, there is a possibility of remittances to being increasingly processed online in the next years.

Another big customer issue, the duration that a remittance transaction takes, can get smaller when alternative transfer channels are used. A direct Bitcoin transfer peer-to-peer takes no longer than 10 minutes until the transfer is verified.

Bitcoin remittance services take a little longer depending on the pay in method and how many times the money must be converted into other currencies. M-Pesa transactions are processed almost real time, what means that when the SMS is sent and received the receiver is in funds and can access the money immediately and pay at shops that accept M-Pesa via mobile payment. This relatively fast speed of alternative channels is helpful for migrants with a short time preference. If they send money spontaneously alternative channels and informal channels should be their method of choice. Also, if there was an incident back home and the money is needed immediately, migrants can depend on these types of payment. A further scope for these transactions is a prompt term for payment and the migrant has to save money until they have the full sum. With this small amount of time needed the payment date can be sticked with. Bitcoin and M-Pesa can tackle the inefficiency of transferring money physically.

Alternative channels compete with informal channels concerning speed and costs. In general, it can be assumed that both channels are even in these categories. Of cause, there are differences from provider to provider and from agent to agent but on the whole they are fast and cost effective. Big disadvantages are the technical requirements for migrants and their commitment to traditional functional transfer methods. Persons especially with a low education level tend to maintain with processes they know and trust in.

As seen in chapter 2.2 average years of education of the migrant's sample were 12.35 which indicates a secondary or tertiary education. It can be assumed that African intra-continental migrants don't have that sort of education level. But all in all, alternative channels can be seen as an opportunity to pull migrants out of informality. The lack of technological knowledge of senders and especially elder receivers is a problem that hugely affects the spread of alternative channels. As the requirement for the usage it can only be tackled by intensified marketing and upgraded customer service.

Since especially Bitcoin remittances are a niche business model in the huge remittance market, marketing campaigns and word-to-mouth advertisement are essential for acquiring new customers and clientele.

One advantage of digital payments that only exist in book money or virtual currency is, that the receiver has the opportunity to make also their payments fully digital. So, there is no need to collect money from an agent. Therefore, no long travels from rural areas to the agent destination need to be undertaken and the risk of getting robbed with carrying a lot of paper cash is zero. When no paying out agent is involved the cash also can't be collected by third persons. Unbanked people have more opportunities to send and receive money besides MTOs and informal channels. Bitcoin wallets can be created easily online and be accessed directly via mobile phones. This wallet complies with a banking account without accounting fees and small transaction fees (Krause 2016, p. 22). This also applies to M-Pesa, while their service is locally limited and Bitcoin is tradable worldwide (Ibid.). This also includes so called illegal migrants into the financial process.

WiFi and Internet penetration is still a problem for sending Bitcoin remittances, since every transaction is made online. Whereas M-Pesa's international transactions work without connection to the Internet, but via telecommunication networks. So, more people in rural Africa have the chance to send their remittances via mobile phone and also can process their transactions directly without contacting an agent (only for in-payments). If a remittance sender wants to make clear that the money they send is exclusively used in a certain disposition, for example their child's education, this can be attained via blockchain based smart contracts[7]. Education fees in Kenya can also directly be payed via M-Pesa (Vodacom 2017). The interstation of remitting to the family in Kenya who then pays the educational fees can be left out.

[7]Smart contracts can be set up between two partners and are monitored and accomplishhed by themselves. That means that if a certain condition is fulfilled the digital money gets paid out.

Price discrmination is at least in Bitpesa's stable fee model not possible. The price discrimination of M-Pesa aims at people who transfer sums slightly above the transition stages of the pricing model.

In addition to that, no double markup can be charged, because the price is stable and visible upfront. Bitcoin and M-Pesa are free from capital controls, since it is no actual money. Thereby it is not possible that any amount of both is held in by financial or governmental institutions. But still the airtime movement of M-Pesa can be tracked, whereas Bitcoin sending and receiving locations are not visible, only the remitted amount. This gives users more possibilities to anonymously send remittances. Though, M-Pesa and Bitcoin are regulated, in different ways depending on the country. M-Pesa has a maximum limit of airtime that can be transferred with one transaction. The amount of Bitcoin that can be transferred within one transaction is not capped.

Besides the regulatory issues for fiat money remittances (chapter 4.3) there is a next tier included when Bitcoin is regulated, too. "In May 2016, Japan issued its first set of regulations for Bitcoin exchanges, along with some clarifications regarding how the law views cryptocurrencies." (Buenaventura 2017, pp. 22-23) Many other countries and organizations recognize Bitcoin, but don't really know how to approach it. Certain laws could exacerbate the work of Bitcoin remittance companies, because they then have to not only stick to the rules of international currency exchange and anti-money laundering laws, but to the Bitcoin regulations, which are different from country to country.

7 Conclusion

This paper examines the market structure of remittances and cuts out the newly emerging alternative remittance channels. It needs to be clear that the alternative channels still belong to a niche market and there is nearly no research on their economic de-

velopment potential. Still the expansion in the traditional market is possible since the choice of a remittance channel is highly dependent from price, speed and safety of the transaction.

A clear market demarcation or equilibration of the market potential is not possible. There are numerous types of channeling remittances. The most frequently used are MTOs, banks and informal providers. Huge differences arise in costs for using these channels with banks being the most expensive, MTOs being in the middle price segment and informal remittance providers being rather cheap. It is hard defining an average price for informal remittances, because there is simply no research data available. Nevertheless, alternative remittance channels like M-Pesa or Bitcoin undercut the formal remittance prices by far.

They establish a real competition in the pricing sector and lower the average costs of remittances. Also in the cause of speed and safety alternative channels are competitive. M-Pesa and direct Bitcoin transactions are processed nearly in real time which is a huge advantage for senders, receivers and for companies that adopt these technologies for setting up their remittance business.

Bitcoin and M-Pesa are attractive alternatives for small amount remittance senders. As the fee for little value remittances is traditionally high at MTOs and especially banks, alternative channels are also rewarding small sums to be remitted, due to their low stable or proportionate fees. Bitcoin is open source and can be adopted without additional costs.

Furthermore, in rural areas the online attainability of alternative channels is an advantage, because the receiver doesn't need to approach an agent. On the other hand, the internet penetration in these areas is weak. This is also a reason for Bitcoin not being that widespread in developing countries. Actually, the premises of high inflation, financial relations and more unbanked population are suffused.

There are many emerging small companies using mobile or Bitcoin technique, establishing a variety of business models. Many of these new remittance companies stick with a settlement process that uses the alternative currency/payment method as an intermediary clearing system. This fastens and cheapens the clearing process between branch offices. It makes the transfer process more efficient since no physical money is sent in various transactions. This is a model that gets adopted by more and more providers. A huge barrier of increasing the use of alternative channels is the low technological knowledge especially in developing countries. Further persons with a rather low education level close their mind to unknown schemes and rather stick with the well-known. The high volatility of Bitcoin as remittance method can be overcome by converting it instantly into local currency after receiving.

If the 3 per cent target of the United Nations can be complied is impossible to foresee. Alternative remittance products step into the right direction, cause their costs are already below 3 % and by this practice new customers are acquired and rivals are pressured. All in all, it can be said that electronic payment systems can have a positive impact on international money transfer and some basic approaches and ideas are already affecting the market.

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