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How Blockchain-Based Technology Is Disrupting Migrants' Remittances: A Preliminary Assessment

Massimo FLORE

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How Blockchain-Based Technology Is Disrupting Migrants' Remittances: A Preliminary Assessment

Abstract

Migrants' remittances represent one of the most important financial flows for developing countries: they contribute to improving the living conditions of families who live in poverty, supporting the development of the most backward economies, and have an immediate impact on families. Remittances are recognized by the UN Global Compact for Migration as an important source of private capital that cannot be equated with any other international financial flow. The cost of sending money abroad is still high, and the fees charged by the various money transfer agencies are particularly expensive and these costs are passed on to the already fragile migrant population. Thanks to the speed of innovation and subsequently declined cost of hardware, a vast number of developing countries are seeing an increase in smartphone ownership. This, connected with poor banking infrastructure and concern about national currency, has fuelled the exploitation of blockchain-backed digital payments. Considering the recent increased volume of online cross-border credit transfers, corporate payments and interbank transfers, blockchain-based technology promises to revolutionize the payments industry, speeding up processes and reducing transaction costs. This report aims at offering a first integrated approach to understanding the potential opportunities, risks and challenges arising from the rapid development of blockchain based technologies in the international remittance industry.

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1 Introduction

In the last ten years, the global volume of remittances to developing countries has increased by 51%. According to the World Bank, remittance flows have increased by 10.8% only in 2018, reaching the record amount of \$528 billion.¹

Every year, nearly one billion people in the world send or receive money, generating an amount of 500 billion dollars in total transfers, roughly three times the amount of development aid.² About 40% of remittances are sent to rural areas, and estimations quantify around €200 transaction per person sent on average each month. In Europe, main sending countries are Germany, France, and Italy.³

Remittances are commonly defined⁴ as "a certain quantity of money sent regularly to families based in home countries that it is commonly used to improve alimentation, access to healthcare, education, housing, raising entire communities over the poverty threshold".⁵ In the last 10 years, remittances grew

Population, migrants, remittances and past decade growth rates

Areas	Population of receiving countries (million)	Growth rate 2007-2016 (%)	Migrants from receiving countries (million)	Growth rate 2007-2016 (%)	Remittances (US\$ billion)	Growth rate 2007-2016 (%)
Africa	1209	25	33	29	60.5	36
Asia and the Pacific	3967	10	77	33	243.6	87
Europe	177	-2	26	19	43.5	5
Latin America and the Caribbean	612	11	33	21	73.1	18
Near East and the Caucasus	198	18	19	38	24.6	37
Total	6163	13	188	28	445.3	51

Source: UNDESA; World Bank

vastly above migration movements, representing a strategic tool for developing countries.

There is a vast literature on remittances, which rose from being a neglected topic to becoming central as a development tool. Migrant remittances are the most visible contribution to the United Nations' Sustainable Development Goals,⁶ and clearly mentioned in the 2030 Agenda for Sustainable Development as primary tool to foster inclusive growth in countries of origin, transit and destination.⁷

Remittances industry is currently dominated by Money Transfer Operators (MTO)⁸, which often charge high transaction fees resulting in a large amount of money not reaching its recipients.

¹ Dilip Ratha, Supriyo De, Sonia Plaza, Ganesh Seshan, Nadege Desiree Yameogo, Eung Ju Kim, Migration and Remittances, recent developments and outlook, World Bank, December 2018.

² F. Ponsot, B. Vásquez, D. Terry, P. de Vasconcelos, *Sending Money Home: Contributing to the SDGs, one family at a time*, Ifad, June 2017.

³ Ifad, *Global Forum on Remittances, Investment and Development 2017*, United Nations, New York, 2017.

⁴ Other studies define remittances as the sum of selected balance of payments flows. In some studies, the sum of workers remittances and compensation of employees, in others the sums of the above balance of payments component plus migrants' transfer are used as proxy for remittances". Alessandra Alfieri, Ivo Havinga, *Definition of Remittances*, Issue Paper, United Nations Statistics Division, February 2006.

⁵ Pedro de Vasconcelos, Frédéric Ponsot, Donald F. Terry, Bibiana Vásquez, *Sending Money Home: Contributing to the SDGs, one family at a time*, Ifad, Rome, 2015.

⁶ <https://sustainabledevelopment.un.org/>

⁷ *Remittances – an untapped engine for sustainable development*, 8 May 2018.

⁸ According to IMF "Money transfer operators (MTOs) are financial companies (but usually not banks) engaged in cross border transfer of funds using either their internal system or access to another cross-border banking network".

Startups using blockchain-based technology promise to solve many of the industry major problems, like high processing fees, slow transaction times and fraud.

This report explores the new channels for money transfer provided by companies operating on blockchain-based technologies. Chapter 2 will offer a brief overview on remittances, its costs and composition. Chapter 3 will address the importance of financial education for migrants' communities and how remittance's role changes at each stage of social inclusion. Chapter 4 will present how cryptocurrencies are beginning to be used as alternative method to transfer money to home countries by migrants.

2. Remittances

Remittances generally consist of both transfer and income elements, defined by the IMF⁹ as "personal transfers and compensation of employees". Money transfers from EU largely show net outflows, while compensation of employees shows more inflows than outflows. Europe was usually a major contributor in personal remittances until 2008, but due to the economic crisis, it has decreased ever since.¹⁰ Not surprisingly, as a result of citizens' freedom of movement, almost 60% of the total personal remittances in Europe came from EU member states. Although some data is incomplete, confidential, or asymmetrical, the analysis of major corridors highlighted the importance of natural proximity. For instance, Germany, Belgium and Luxembourg are exposed to their neighbouring countries for border and seasonal work, just as France, Germany, Italy, and Austria benefit from inflows from residents working in Switzerland. Data shows that for personal remittances (intra and extra EU) the major sending countries in Europe are Germany, France, and Italy.¹¹

In December 2018, the UN General Assembly endorsed the adoption of the Global Compact for Safe, Orderly and Regular Migration (GCM), following the two-day Intergovernmental Conference on Migration in Marrakech (Morocco), to improve governance and international understanding of migration, and to strengthen the contribution of migrants and migration to sustainable development.¹² Objective 20 explicitly promotes "faster, safer and cheaper transfer of remittances and fosters financial inclusion of migrants". Some of the commitments include harmonizing remittance market regulations and increasing the interoperability of remittance infrastructure along corridors by ensuring that measures to combat illicit financial flows and money laundering do not impede migrant remittances through undue, excessive or discriminatory policies.¹³

Migrant remittances are an important source of funding for a large number of developing countries. At the same time, correct collection of outgoing remittance flows is also a priority for the advanced countries, both for an undistorted assessment of policy interventions and for a correct compilation of the national balance of payments. The works that address the issue of quantification of the flows that circulate through informal channels not detected by official statistics are relatively few and are always focused on the size of the resident foreign population.¹⁴

The economic literature has focused mainly on the economic, institutional and socio-demographic factors that influence remittance flows, including both micro and macroeconomic variables. The former refer to the individual characteristics of the migrant or, where the data do not allow otherwise, to the characteristics of his / her community: gender (or gender distribution), age (or percentage of working age population), presence of a family unit, level of education and professional qualification. These are variables indicative of income / saving capacity and the degree of motivation to support the family of origin.¹⁵

The macroeconomic factors instead reflect the economic, institutional and socio-demographic characteristics of the country of origin of the migrant and the host country: GDP per capita and

⁹ International Monetary Fund.

¹⁰ Ifad, *Global Forum on Remittances, Investment and Development 2017*, United Nations, New York, 2017.

¹¹ Eurostat, *Personal Transfers in the EU*, Eurostat Newsrelease, November 2017.

¹² Intergovernmental Conference to Adopt the Global Compact for Safe, Orderly and Regular Migration, (<http://undocs.org/A/CONF.231/3>).

¹³ United Nations, *Global Compact for Safe, Orderly and Regular Migration*, Final Draft, 11 July 2018.

¹⁴ Robert Obrzut, *Personal remittances statistics*, Eurostat, 2017.

¹⁵ Pedro de Vasconcelos, Frédéric Ponsot, Donald F. Terry, Bibiana Vásquez, *Sending Money Home: Contributing to the SDGs, one family at a time*, Ifad, Rome, 2015.

growth, exchange rate (nominal and real), interest rate, unemployment rate, quality of institutions.¹⁶

Balance of personal transfers in EU Member States (in € million)

	2011	2012	2013	2014	2015	2016
Extra-EU balance of personal transfers	-20.4	-19.8	-19.0	-19.5	-20.3	-20.4
Extra-EU inflows	10.2	10.8	10.4	10.6	11.0	9.9
Extra-EU outflows	30.6	30.6	29.4	30.1	31.3	30.3
Intra-EU flows	13.3	13.1	14.0	13.6	14.2	14.2

Source: Eurostat

Geographical distance, as a rule, is not among the variables that contribute to determine the flow of remittances. Less attention was given to the estimate and analysis of remittance flows not reported by official statistics. The World Bank, in an effort to build a global database of bilateral flows, has developed a methodology that allows, at least in part, for estimating the informal channel as well.¹⁷ In this approach, the bilateral flows are estimated starting from the total remittances entered by each country; these are then distributed pro quota to the various source countries on the basis of the weight of the resident community of emigrants and the economic gap between the two countries.

The World Bank methodology provides, as a first approximation, an estimate of bilateral flows based on the total revenue declared by the receiving countries. The estimate includes official and informal flows, but only to the extent that these are recorded at least by the receiving country; it is not possible to grasp the transactions that escape detection in both the country of origin and the beneficiary country. For the purposes of these estimates, however, both the remittances of the workers in the strict sense and the "income from work", i.e. the income received by workers temporarily present in European territory (residents for periods of less than one year), were considered jointly.¹⁸

The decision to consider these jointly is due to the fact that many countries do not publish remittances and income from work separately. The incomes of cross-border and seasonal workers have a considerable impact. The results thus obtained cannot therefore be considered an estimate of remittances in the strict sense and it is not clear how much of the discrepancy with official data can be attributed to the informal component due to the different aggregate considered.¹⁹

¹⁶ Robert McNabb, M.I.T.El-Sakka, *The Macroeconomic Determinants of Emigrant Remittances*, World Development, Vol. 27, No. 8, pp. 1493-1502, 1999

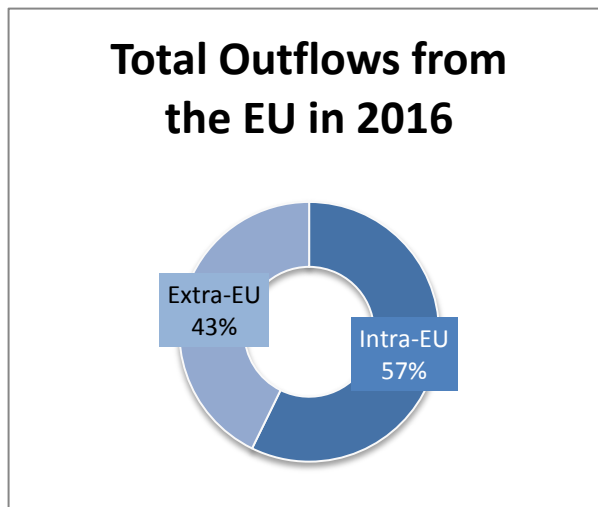
¹⁷ World Bank, *Migrants' Remittances from the United Kingdom*, London, July 2015.

¹⁸ Ibrahim A. Elbada, Robert de Rezende Roch, *Determinants of Expatriate Workers' Remittances in North Africa and Europe*, The World Bank, Washington DC, November 1992.

¹⁹ Robert Obrzut, *Personal remittances...*

For this reason, in 2012 Banque de France updated its methodology for estimating remittances based on the approach of the World Bank; the results obtained (the data after 2009 were revised), were about double compared to those of the previous approach. However, even if in this case the starting aggregate is limited to remittances only, it is not possible to attribute the extent of the correction solely to the inclusion of the informal channel, as the previous system, based on the reports from the banks that operated on behalf of customers, did not report remittances sent through non-bank intermediaries such as MTOs.²⁰

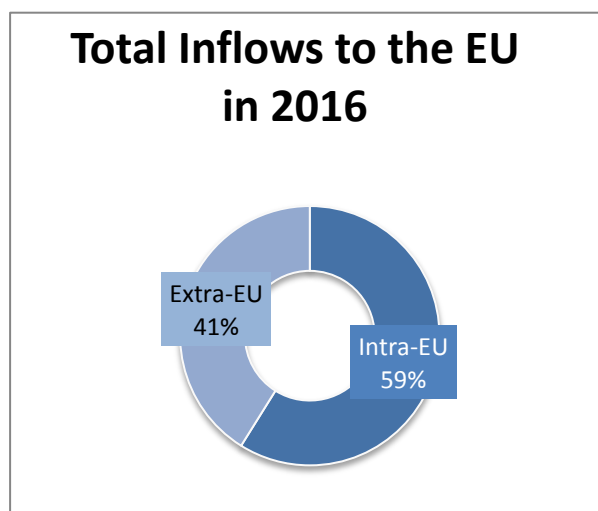
The first attempt to estimate the size of the informal channel for a large number of countries was carried out in 2005 by economists Freund and Spatafora²¹. The authors used a longitudinal dataset (panel) containing remittances received from 104 countries in the world for the period 1995 -



Source: Eurostat

2001. After estimating a theoretical cost index for the set of countries considered, the authors calculate the elasticity of remittances compared to it; therefore they hypothesize that the average cost of the official channel is reduced to a level comparable to that of the informal channel (what-if analysis) and calculate the increase in the flow of remittances that would be observed based on the estimated parameters of the model.²²

According to this approach, the size of the movements that flow through informal channels would be between 35 and 75 percent of the official ones, depending on the country in question. In general, the size of the informal flows would be more substantial for the beneficiary countries of Africa, Eastern Europe and Central Asia, and less substantial for those of East Asia of South America. The research also found a significant correlation between the growth of officially recognized remittances and the reduction of the item "errors and omissions" in the balance of payments of the countries in the sample, and concludes that part of the increase observed



Source: Eurostat

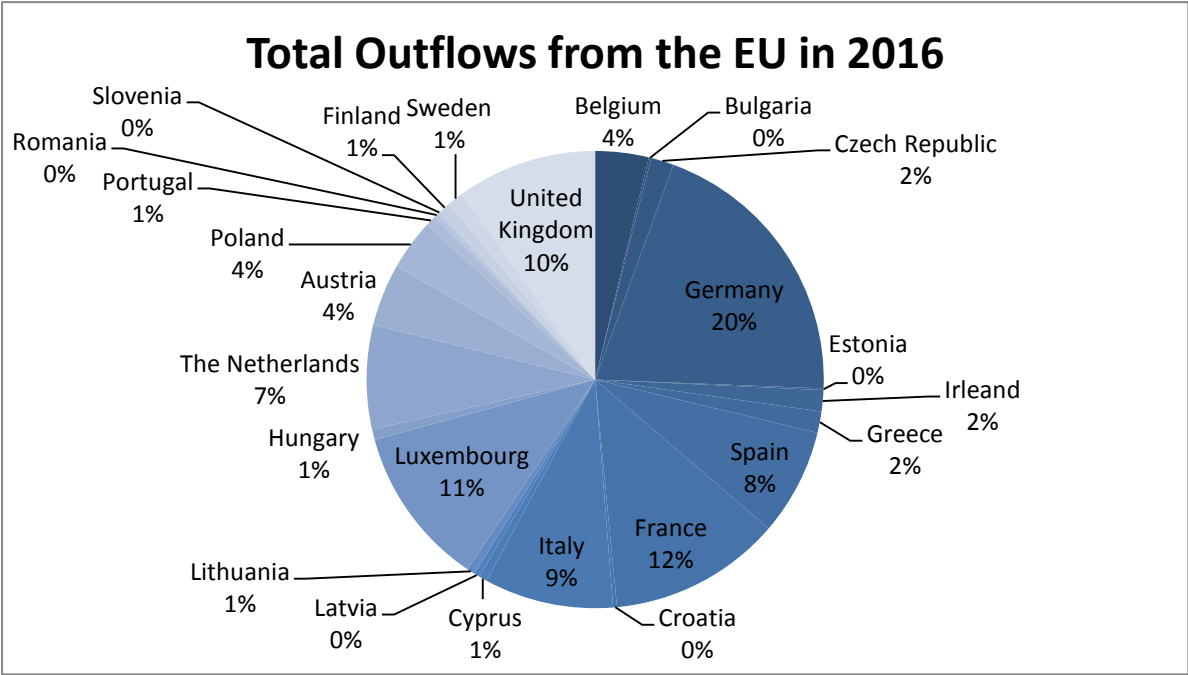
over time in official remittance flows is probably due to the "emergence" of transactions previously conducted through informal channels, favoured by the progressive reduction of costs at a global level.

²⁰ World Bank, *De-Risking in the Financial Sector*, 7 October 2016

²¹ Caroline Freund, Nikola Spatafora, *Remittances: Transaction Costs, Determinants, and Informal Flows*, Policy Research Working Paper; No. 3704. World Bank, Washington, DC, 2005.

²² Caroline Freund, Nikola Spatafora, *Remittances: Transaction Costs...*

Factors influencing the choice of channel to send remittances have recently been analysed using the evidence obtained from a special sample survey conducted in the Netherlands on 1680 migrants. The study confirms that recourse to the informal channel depends on cost considerations (due to the presence of fees and fixed fees applied by official intermediaries,



Source: Eurostat

remittances of small amounts are more likely to be transferred informally) and, to a lesser extent, by the socio-economic level of the migrant (recourse to the informal channel decreases as the level of education increases). The results are in line with previous studies, which identify the cost of official intermediation as the main reason for using the informal channel.²³

Remittances have always played a central role in the global economic ecosystem. What began with a simple barter system, through the ages evolved into the modern day sophisticated technological money transfer structure. Transportability is one the primary characteristics that qualify a good medium of exchange. Chinese paper voucher known as "flying money" in the VII century, meant to safeguard travellers against robbery, may be considered as the first money transfer system in history, followed by the written instruction of exchange bills used to transfer money to crusaders, with Templars and Hospitallers functioning as bankers.²⁴

Present day money transfer works mainly using "wire transfer", an electronic based system that goes from a bank or credit institution, to another using a network such as SWIFT or Fedwire. Wire transfers are backed by traditional financial institutions that ensure coverage, speed, and security. On average, the remittance process may take a couple of days or even weeks, when an "exotic currency" is involved, and goes through a lengthy clearing process from central banks.²⁵

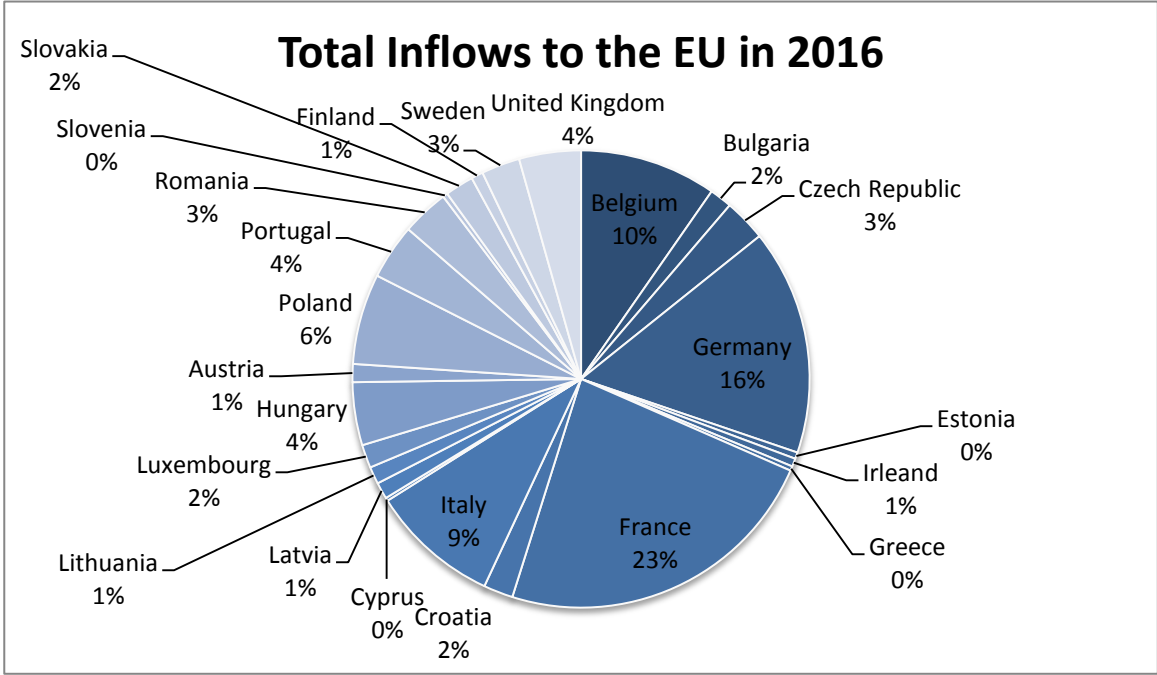
To send a cross-border payment, customers must find a transmitter with contacts with financial institutions in both the transmitting and recipient countries. The process is further complicated by the presence of many intermediaries, each one charging their own fees for the service.

²³ Caroline Freund, Nikola Spatafora, *Remittances: Transaction Costs...*

²⁴ Dilip Ratha, *The impact of remittances on economic growth and poverty reduction*, Migration Policy Institute, Washington DC, 2016.

²⁵ Sophie Edwards, *Five trends affecting the remittance industry*, Devex, 9 December 2016.

In general, remittances are processed through specific models, such as: pre-fund and post-fund. The former works on corridor basis (e.g. Germany – Turkey; Italy – Morocco; France – Ivory Coast) allowing the sending agent to quickly settle the net amount with the beneficiary bank. In the post-fund model it is instead the beneficiary bank that advances the amount to the beneficiary and has to absorb the loss if the sending bank defaults. In both models, costs are borne by either part and represent a major issue for cross-border remittances. For instance, in the pre-fund model the transfer agent has to keep a deposit with the receiving bank, in most cases without interest.²⁶



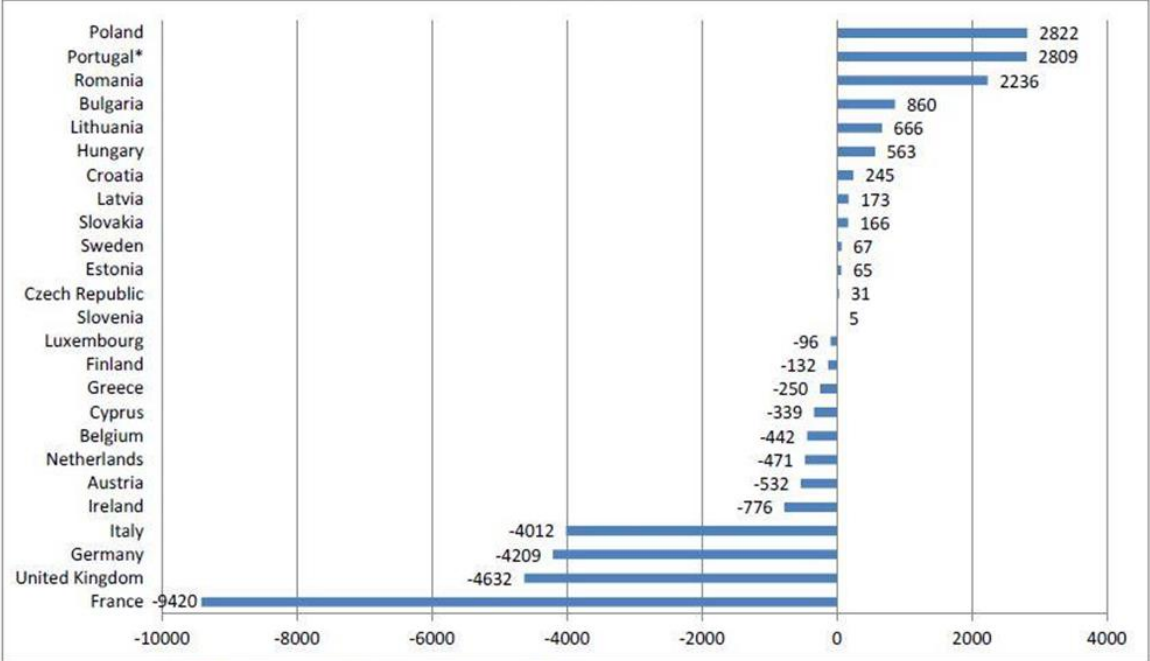
Source: Eurostat

Moreover, experts believe SWIFT²⁷ is proving to be inefficient in the settlement of cross-border payments due to its lack of transparency in clearing risks and payment status, particularly for non-bank customers. Cross-border payments definitely represent the weak link in the global remittance chain, in particular if the customer lives in an underserved or under-banked community. In such cases, although very common, the person would have troubles accessing money transfers through the established channels.²⁸

²⁶ Giulia Bettin, Andrea Filippo Presbitero, Nikola Spatafora, *Remittances and Vulnerability in Developing Countries*, International Monetary Fund Working Paper, 2014.
²⁷ SWIFT stands for "Society for Worldwide Interbank Financial Telecommunication". It is an internationally recognized identification code for banks around the world.
²⁸ Ifad, *Global Forum on Remittances, Investment and Development 2017*, United Nations, New York, 2017.

Remittances represent a critical lifeline for many people, improving financial inclusion, boosting (in some cases) countries' GDP, and are mostly the result of migration flows around the world. Remittances are recognized for their potential to reduce poverty and act as insurance for the poor developing countries. Remittances frequently represent the quickest form of aid to reach disaster-hit regions. This was, for instance, evident in 2015 during the aftermath of the disastrous Nepal earthquake.²⁹

Balance of personal transfers in EU Member States, 2016
(in € million)



Balance is not presented for Member States for which data are confidential.
* Data refer to workers' remittances only.

Source: Eurostat

Sending money overseas is expensive and is particularly disadvantageous for the migrant communities receiving it. According to the World Bank, the global average cost for remittances was 7.1% in 2018, but it can be higher depending on the corridor used.³⁰ For instance, sending money from Europe to some countries in Africa may cost an extra 15%, while the fees for intra-African transfers can be painful.³¹

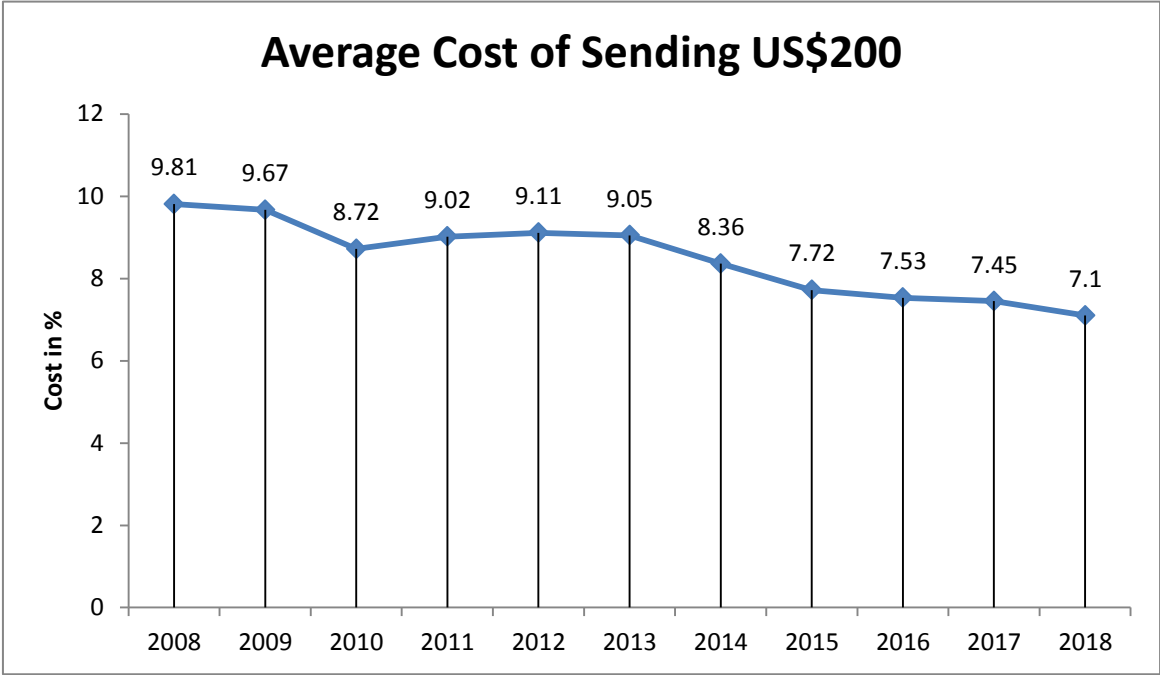
UN Member States have agreed that in order to achieve a safer, orderly and regular migration, a cheaper, safer and faster remittances system should be implemented. In the Sustainable Development Goals there is a target on reducing the cost of transfer from an average of 7% to less than 3% by 2030.³²

Competition in mature corridors helps keeping fees down, as a high remittances volume attracts new service companies, but does not guarantees high competition. Exclusive access to the distributional network, such as post offices, may distort competition in the corridor.³³

²⁹ Giulia Bettin, Andrea Filippo Presbitero, Nikola Spatafora, *Remittances and Vulnerability in Developing Countries*, International Monetary Fund Working Paper, 2014.
³⁰ The World Bank, *Remittance Price Worldwide*, Issue 28, December 2018.
³¹ World Bank, *Remittance Prices Worldwide*, Issue 26, June 2018.
³² United Nations, *Global Compact for Safe, Orderly and Regular Migration*, Final Draft, 11 July 2018.
³³ George Borjas, *The Economics of Immigration*, Journal of Economic Literature, Issue 32, December 1994.

There are several reasons why international money transfers costs are so high. The vast majority of transfers happen through Money Transfer Operators (MTOs), where a few vendors hold a dominant market share. The oldest is Western Union, founded in 1851 as a telegraph company; it currently has about 550,000 agents in more than 200 countries.³⁴

Together with MoneyGram and RIA, it controls more than a quarter of the international market. In their model, agents pay all the operating costs in exchange for their franchise and a commission on sales.³⁵



Source: World Bank

The lack of competition and often unclear financial regulations in a highly regulated industry has constantly been the focus of various development groups. Dilip Ratha,³⁶ one of World Bank's remittances top experts, openly stresses that "money transfer companies structure their fees to milk the poor" for what is commonly referred as "super-tax" on international transfers paid in particular by African migrants, with some smaller exchange providers who even charge fees to people collecting remittances.³⁷

According to recent studies, an estimated range amount from 33 to 44.6 billion euros is diverted from their final recipient, and ends up in fees and opaque foreign currency charges. The size of remittance also plays a role in shaping the fee: for instance, fees may drop from 21% to below 4% if the transaction amount increases to near 1000€.³⁸

The World Bank assessed that derisking - defined as "the practice of financial institutions to close the accounts of clients perceived as high risk for money laundering or terrorist financing abuse" - is the biggest threat the remittance industry is facing. It is threatening the progress made in the last years on financial inclusion, with negative effects on the reduction of

³⁴ Patrick Collinson, *The huge profits earned by big banks on overseas money transfers*, The Guardian, 8 April 2017,
³⁵ Ben Schiller, *The Fight For The \$400 Billion Business Of Immigrants Sending Money Home*, Fast Company, 28 April 2018
³⁶ Dilip Ratha personal website, see <http://dilipratha.com/>
³⁷ Dilip Ratha, *Workers' Remittances: An Important and Stable Source of External Development Finance*, The World Bank, Washington DC, 2003.
³⁸ Dilip Ratha, *The impact of remittances on economic growth and poverty reduction*, Migration Policy Institute, Washington DC, 2016.

remittances prices and fee as an increasing number of banks close or restrict access for money transfer operators, in particular those that operate in areas with political conflicts or natural disasters.³⁹

The global restrictive financing regulations, combined with the 2008 financial crisis, have convinced a number of financial institutions to progressively abandon sectors assessed as high-risk, unprofitable or complicated which, together with the progressively inefficient ways of identifying senders, is diverting remittance payment to informal channels. Nowadays migrants are also looking for new services beyond simply sending cash home, which can include bank credits and managing money in more than one country.⁴⁰

The remittances industry is slowly embracing technology to enhance real-time transaction scanning, automated identification, real-time cross-border settlements, and better foreign exchange management. In a world where the Internet has opened up communication, and Chinese low-cost Android phones have given to millions of people the possibility to manage all essential aspects of their human and economic relationships, several enterprises were born during the last decade.

M-Pesa is a remittance company launched in Kenya in 2007 by Safaricom, a Vodafone associate, and represents a textbook case of "leapfrog technology" in a developing country. The name puts together M – for Mobile – and Pesa, which in Swahili means "money". The project – inspired by how many African customers used to transfer each other prepaid airtime as a sort of currency – was initially developed by Sagentia, with the cooperation between the United Kingdom's Department for International Development and Vodafone, as a tool to improve access to financial services. Soon after its launch, it became clear that customers were using the service for more than microfinance projects: M-Pesa was used to avoid robberies by businesses, which preferred to deposit the money digitally rather than keeping it in a safe, or by people to feel secure during long trips. It quickly became a safer option to send money back home, instead of entrusting a bus driver with an envelope full of cash. In ten years, thanks to an agreement between Vodafone and MTN Mobile Money, M-Pesa reached countries like Albania, Egypt, Ghana, India, Uganda, Rwanda, Cameroon, Liberia, Nigeria, Zambia, Kenya, Lesotho, Mozambique, Ivory Coast, Benin, Democratic Republic of Congo, South Africa, Romania, Tanzania, Afghanistan, and many others. For a small fee, clients can easily charge their account through an agent to pay for goods and services, deposit or transfer money, thus preventing the risk of theft, and increasing the access to financial services for a large amount of population. M-Pesa currently serves about 30 million users and employs almost 290 thousand agents.⁴¹

Another example is WorldRemit, a London-based company that defined itself as the "WhatsApp of Money". Founded in 2010 by Somalian Ismail Ahmed, a former United Nations officer, it provides international remittance services from 50 to more than 140 countries, with the aim of reaching parity in the near future.⁴²

On the other hand, TransferWise goes in a completely different direction, moving money virtually without any cross-border transfer. Inspired by Hawala, the traditional Islamic banking system, where value moves around an international network of brokers, in a system defined as "money transfer without money movement", TransferWise pairs money transfers according to mutual corridors. For example: if somebody from Germany would like to send 100€ to Turkey,

³⁹ World Bank, *De-Risking in the Financial Sector*, 7 October 2016.

⁴⁰ Tracey Durner, Liat Shetret, *Understanding Bank De-Risking and its Effects on Financial Inclusion*, Global Centre, November 2015

⁴¹ Nick Hughes, Susie Lonie, *M-PESA: Mobile Money for the "Unbanked" Turning Cellphones into 24-Hour Tellers in Kenya*, Innovations, Winter/Spring 2007.

⁴² Ingrid Lunden, *WorldRemit nabs \$40M at a \$670M valuation to boost its money transfer business*, TechCrunch, 7 December 2017.

TransferWise finds someone who wants to send money the other way round. Each customer puts the money in a TransferWise account in their own country, and then it's up to the company to perform the virtual transfer.⁴³

Informal remittances networks, such as: hawala; hundi; fei chien; etc., rely on trust and self-regulation and have proven to be able to protect customers against losses, but not completely against fraud. The growing reliance on informal or parallel channels represents clear evidence that reducing transaction fees would not only increase the disposable income of remittance recipients, but also regain them to the more formal channels.⁴⁴

In the future, remittances may be commoditized and become free, as the customers would pay for other products, such as loans and business microfinance. Some banks have already been offering free remittance services to attract new business. According to recent studies, lowering remittances fees will increase flows to developing countries, as migrants would send more money if the costs were reduced. In a recent survey performed by the World Bank on Senegalese migrants in Belgium, the large majority declared they would send more money through established MTOs if costs were significantly lowered.⁴⁵

2.1 Remittances and Money Laundering

Although official remittances channels have not been openly used to finance illicit activities, some problems arose with the informal remittances systems, which is virtually out of reach for the anti-laundering regulations.⁴⁶ In a recent hearing at UK House of Lords, EU Counter-terrorism Coordinator explained that "while hawala and other alternative remittance systems serve entirely legitimate purposes, they may also offer an opportunity for criminals and terrorist organisations to move funds virtually without there being any traceability".⁴⁷ Letting these informal networks operate outside the regulatory space is deemed to pose "serious macroeconomic management problems" and "fundamentally destabilising conditions" for countries.⁴⁸

Money transfer industries operate in a heavily regulated environment, where a licence is required in every jurisdiction, anti-money laundering, and anti-terrorism regulations were tightened after the 9/11 attacks, thus also raising the cost of sending money internationally. For

⁴³ William D. Porteous, *The Enabling Environment for Mobile Banking in Africa*, Department for International Development, 2006.

⁴⁴ Mohammed El Qorchi, Samuel Munzele Maimbo, and John F. Wilson, *Informal Funds Transfer Systems. An Analysis of the Informal Hawala System*, International Monetary Fund, August 2003.

⁴⁵ Massimo Cirasino, Carlo Corazza, Isaku Endo, Jose Antonio Garcia, Rahul Kitchlu, Marco Nicoli, Kai Schmitz, Paloma Monroy, *Guidance report for implementation of the CPSS-World Bank general principle for international remittances services*, World Bank Financial Infrastructure Series, October 2012.

⁴⁶ This is an example of money laundering activity disguised as informal remittance service, as described in 2010 FAFT report: "An East African residing in Belgium, Mr X, stated that he performed Hawilaad banking activities. His account was exclusively credited by cash deposits and numerous transfers in small amounts. During several months the funds were transferred to company A in Eastern Africa. Shortly afterwards the funds were transferred to company B in Western Europe. Companies A and B performed money remittance transactions around the globe. Mr X claimed that he performed Hawilaad activities for fellow countrymen wishing to send money to Eastern Africa. However, he did not hold any position within Belgian companies and he was not registered as manager of an authorised exchange office. The individual did not have an authorisation from the CBFA (banking supervisor) either. Police sources revealed that he was known to be a member of a terrorist organisation. In this case the alternative remittance system may have been used for terrorism financing".

⁴⁷ House of Lords, *Money laundering and the financing of terrorism - European Union Committee*, European Union Committee - Nineteenth Report, London, 14 July 2009.

⁴⁸ Joanna Trautsolt, Jesper Johnson, *International anti-money laundering regulation of alternative remittance systems: Why the current approach does not work in developing countries*, Journal of Money Laundering Control, Vol. 15 Issue: 4, 2012, pp.407-420.

this reason, financial institutions are required to identify customers and report transactions above \$10,000, putting a compliance burden that establishes a high barrier to new entrants. Experts agree that the money transfer system is not immune to misuse, but argue that the average size of remittances is between 200 and 300 Euros per transaction, making it essentially inefficient as money laundering tool.⁴⁹

On the other hand, Informal Remittances Systems, which came under scrutiny for their allegedly role in financing illegal activities, were sometimes connected to terrorist organizations. This particular system to transfer money has numerous advantages. It is quick, discreet and reasonably priced, making it attractive for both legal and illegal use.⁵⁰

It is difficult to prove illegal activities, as these systems are trust-based, secretive and unregistered. Some countries have tried to regulate their activities, establishing licensing and registration for services, and monitoring the compliance with law through the implementation of a sanction regime. Some other countries have simply forbidden every informal money transfer, without much success.⁵¹

The criminalisation of Informal Remittances Systems as a vehicle for financing illegal activities has indeed proven ineffective. The application of formal financial sector regulations has created resistance, having been perceived as an external imposition which did not take in consideration important cultural, social and religious factors. Moreover, it completely failed to consider the informal remittance system as a legitimate exchange mechanism used for non-criminal purposes by millions of people around the world, thereby losing the opportunity to use it as a collective action for community engagement.⁵²

⁴⁹ Karina Shedrofsky, *Remittances and Trade-Based Money Laundering, Organized Crime and Corruption Reporting Project*, 12 June 2018.

⁵⁰ *Money Laundering through Money Remittance and Currency Exchange Providers*, Fatf Report, Council of Europe, June 2010.

⁵¹ Mohammed El Qorchi, Samuel Munzele Maimbo, and John F. Wilson, *Informal Funds Transfer Systems. An Analysis of the Informal Hawala System*, International Monetary Fund, August 2003.

⁵² Gichuki Edwin Mugo, *The role of money remittance companies on money laundering and channelling money for illegal activities in Kenya on the growth of financial sector in Kenya*, International Journal of Economics and Finance (IJEF), 2015, volume 1 (2), 78-99.

3. Migrants Integration and Financial Exclusion

Financial exclusion is commonly identified as a main obstacle in migrants' integration process. A common definition describes it as: "the impossibility or reluctance for some individuals - or companies - to access basic financial services, such as current and deposit accounts, loans, insurance services, and payment".⁵³ There may be different degrees of financial exclusion, depending on the level of complexity of the services used and/or the use of unofficial suppliers. However, the World Bank considers "financially excluded" only those who do not have any kind of access to financial products. At the beginning of the seventies, social exclusion was defined as "the set of complex processes that deprive some people of access to a predominant lifestyle". A definition that goes beyond the concept of poverty - assumed as the minimum income threshold - and which is the result of a complex system of deprivation. Nevertheless, considering the three dimensions of social exclusion (economic, political and relational), the definition of financial exclusion must take into account its link with social exclusion, defined as "the capacity of the individual to participate actively in the economic life of the country in which he lives".⁵⁴

The migrant, from a socio-economic point of view, is greatly vulnerable. Without a financial and credit history, with a higher level of job insecurity, difficult access to housing, no skills recognition, together with linguistic and cultural difficulties related to his or her immigration status, migrants are definitely more at risk of social exclusion.⁵⁵

Access to services and financial products is essential in the process of integration and inclusion, as it reduces vulnerability, both with respect to savings capacity - thus reducing the use of informal channels - and with respect to the capacity to deal with emergency situations. The availability of asset-building instruments aimed at accumulating and protecting savings seem essential to increasing the chances of entering the social fabric (e.g. personal development, investment in education and professional training) and production (e.g. work, business activities, possibility of investment). Furthermore, financial inclusion is one of the most important instruments for labour mobility in Europe.⁵⁶

The prevailing international literature demonstrates that the definition of financial exclusion as the mere possession of a current account or a financial product does not describe the complexity of the phenomenon. For these reasons a complete definition of financial inclusion should mention "a set of activities developed to facilitate access and effective use of banking services from part of subjects and organizations not yet fully integrated into the ordinary financial system".⁵⁷

Technological advances, financial innovation, and the development of markets do not seem to have been accompanied by proportional growth in citizens' economic knowledge. Education is therefore an essential component of the financial inclusion process, capable of preventing and removing some of the causes that fuel the phenomenon of exclusion. Recent studies have clearly shown the positive link between a higher level of economic education and a better level of financial inclusion, while also highlighting that unemployed, low-income families, immigrants are social groups that need special attention in the field of financial education initiatives.

⁵³ Uuriintuya Batsaikhan, Maria Demertzis, *Financial literacy and inclusive growth in the European Union*, Policy Contribution, Issue n. 08, May 2018.

⁵⁴ United Nations, *Remittances – an untapped engine for sustainable development*, 8 May 2018.

⁵⁵ Ibrahim A. Elbada, Robert de Rezende Roch, *Determinants of Expatriate Workers' Remittances in North Africa and Europe*, The World Bank, Washington DC, November 1992.

⁵⁶ Giulia Bettin, Andrea Filippo Presbitero, Nikola Spatafora, *Remittances and Vulnerability in Developing Countries*, International Monetary Fund Working Paper, 2014.

⁵⁷ Dilip Ratha, *Workers' Remittances: An Important and Stable Source of External Development Finance*, The World Bank, Washington DC, 2003.

Greater financial literacy, as well as a more efficient management of financial resources, also translates into greater confidence in established intermediaries, with less reliance on informal and illegal channels.⁵⁸

Social integration, financial inclusion and financial education are therefore the processes that are combined and mutually self-reinforcing and cannot be split within the wider process of economic integration. According to a recent World Bank estimate, more than half of the adult world population (about 2.5 billion people and 450 million businesses) and over 97% of those living in emerging and developing countries do not use official financial services. While financial exclusion approaches the world average (equal to 49.5% of the adult population) in most geographic areas, in the case of Africa it reaches peaks of 80%. According to experts, the first cause of financial exclusion is socio-economic (65% of adults without a bank account feel like they do not earn enough for living), while the main entry barrier is made up of high costs (25% of adults who do not have a bank account), followed by accessibility in terms of geographical distance. Authorities can intervene at different levels in each of these issues, promoting social financial inclusion, fostering innovation and competition in the financial services market, providing or encouraging direct private investments in infrastructure, and providing adequate protection for users as well as supporting financial education initiatives.⁵⁹

3.1 Integration Process

A recent study by Italian Think Tank CeSPI provides a schematic description of the gradual formation of different immigration profiles based on three identified different stages of the integration process, highlighting the connections between financial inclusion and integration.⁶⁰

Phase	Integration Process	Financial Needs
1 - Arrival	<ul style="list-style-type: none"> ➤ Find a Job. ➤ Documents and Permits. ➤ Linguistic Barrier. ➤ Rely on migrant's community. 	<ul style="list-style-type: none"> ➤ Access to financial system. ➤ Send money home to repay travel debt.
2 - Stabilization	<ul style="list-style-type: none"> ➤ Steady Job. ➤ Beginning of the Integration Process. 	<ul style="list-style-type: none"> ➤ Access to credit and saving. ➤ Send money home to support family.
3 - Integration	<ul style="list-style-type: none"> ➤ Remain in hosting country. ➤ Family long-term needs. 	<ul style="list-style-type: none"> ➤ Access to complex financial instruments. ➤ Send money home for investments and support to the community.

Source: CeSPI

⁵⁸ Simon Batchelor, *Changing the Financial Landscape of Africa: An Unusual Story of Evidence informed Innovation, Intentional Policy Influence and Private Sector Engagement*, IDS Bulletin Volume 43 Number 5 September 2012.

⁵⁹ Kevin Watkins, *Remittances: the huge cost to Africa in money transfer fees*, Odi, 2016.

⁶⁰ Daniele Frigeri, *Osservatorio Nazionale sull'Inclusione Finanziaria dei Migranti in Italia*, Terzo Rapporto, CeSPI, 2014.

The first phase (Arrival) is characterized by the necessity for regularization and access to residence permit to meet basic needs. This is a particularly demanding phase, where in most cases a poor (or non-existent) knowledge of the language constitutes a significant obstacle. There is therefore a need for language learning assistance, and for a quick catch up with the cultural, social institutions and services of the hosting country. The extended family and community constitute the main point of reference as well as the main source of information and financial support for the migrant. At this stage, financial needs are very limited, mainly related to access to the payment system and the possibility of accumulating small savings to deal with emergencies. From a financial point of view, the arrival phase is characterized by a high level of fragility and vulnerability, thus access to basic financial instruments may be essential for entering the economic system and avoiding or reducing the weight of informal circuits that expose individuals to greater risks and costs. The need to send money back home in the form of remittances plays an important role, as it is essentially a way to repay the debt contracted by migrating.⁶¹

The second phase (Stabilization) is where the process of integration begins and work stability is undoubtedly the main factor. The financial needs, characterized by the prevalence of savings and credit, change and will continue that way until the integration process is completed. The process of integration requires increasing resources and access to credit therefore becomes an essential component for guaranteeing the education of children, the purchase of consumer goods, or the start of a small business. In this phase, sending money back home takes a new dimension: once the migration debt has been repaid, what remains is the moral debt to support the family in the home country and contribute to improving their living conditions. After all, migration is very often an investment resulting from a strategy decided at family level. For this reason, financial inclusion becomes fundamental for sustaining and accelerating the ongoing integration process.⁶²

The third phase (Integration) represents the most advanced stage of the process and often coincides with the decision to stay in the hosting country, with the creation of a family through reunification or from scratch. At this stage, financial needs and behaviours take different and more complex connotations, ranging on a medium-term horizon, and often includes the purchase of a house, the creation and management of supplementary pension forms and investments, always with particular attention to the future of children. At this stage, sending money home is still present; however it assumes a different dimension, because alongside the support for the family of origin and the improvement of its living conditions, a third dimension appears, linked to the investment opportunities in the country of origin, like buying property or land, starting a business or simply investing in financial products, taking advantage of the international differential rate.⁶³

At each stage there are corresponding needs and therefore very different financial inclusion strategies. If the arrival phase is characterized by a need for access to basic financial services at reduced costs, the stabilization phase appears to be the most complex, where the interaction

⁶¹ Daniele Frigeri, *Osservatorio Nazionale...*

⁶² Daniele Frigeri, *Osservatorio Nazionale...*

⁶³ Daniele Frigeri, *Osservatorio Nazionale...*

between public policies and strategies operators can contribute to optimizing efforts and avoid financial exclusion. Finally, the integration phase is the one in which migrants and local clients do not distinguish themselves anymore and indeed do not want to be distinguished, even if some characterizations remain.

Remittances represent a distinctive factor and constitute a key element of migrants' financial behaviour, remaining always present, though with different meanings during the integration process. Volume and frequency of remittances vary depending on a wide array of variables, including the characteristics of the socio-economic and cultural context and the migration project, the behaviour of migrants in their integration process, the instruments used for sending remittances, and the complex interaction between the destination territory, the level of income and the cost of living. In the first phase of migration, sending money to the country of origin is not only a need, but an obligation and a responsibility. In many cases, there is the necessity to repay the debt contracted to make the journey, or to provide for the family in deep financial difficulty.⁶⁴

The World Bank launched in 2011 a project called Greenback⁶⁵ 2.0, offering financial education workshop for migrants' communities of several selected cities. The objective was to make the remittances market more transparent, efficient, and promote migrants' access to financial services for them to better contribute to the local economy.

A further consideration should be made of the ongoing shift within the remittance market, from the traditional cash-to-cash transactions, to the use of IT and mobile channels, such as online transfer through smartphones. While in fact official data only reveal the cash-to-cash methodology, field surveys are highlighting an increasing, albeit for the moment marginal, role in the intermediated volumes of these new money transfer models.⁶⁶

⁶⁴ Ferruccio Pastore, Flavia Piperno, *Welfare Transnazionale: un ambito strategico d'intervento per la cooperazione decentrata?*, CeSPI, 2006.

⁶⁵ More info: <https://remittanceprices.worldbank.org/en/project-greenback-20-remittances-champion-cities>

⁶⁶ Uuriintuya Batsaikhan, Maria Demertzis, *Financial literacy and inclusive growth in the European Union*, Policy Contribution, Issue n. 08, May 2018.

4. Remittances through Cryptocurrencies

In recent years, a new trend has emerged among migrant workers to send money back to families in home countries: the use of cryptocurrency services. The cryptocurrency market is still in a nascent stage in terms of reaching the migrant population masses, but it may have considerable potential in the future. With the advent of blockchain, several companies and startups have begun adopting cryptocurrencies like Bitcoin to offer remittance services.⁶⁷ In a sector highly dominated by Western Union and MoneyGram, these new players are offering a different money transfer service, trying to solve multiple issues such as the high transfer costs, the limited money distribution methods, limited brand options, limited ways to deal with money, etc. Most of remittances receivers do not live in big urban centres and, most of time, they must walk for several hours, sometimes an entire day, in order to get to the nearest money transfer office, receive the money and go back to the place where they live.⁶⁸ It is not only time consuming, but depending on weather conditions, it may be impossible to reach the urban sites for prolonged periods of time. Moreover, rapid growth in smartphone adoption⁶⁹ is one of the main reasons why the digital remittance market has steadily increased in size. At the moment, the fastest developments are happening in Southeast Asia, in particular the Philippines and Vietnam, but some African countries – like Kenya, Tanzania, Nigeria, and Uganda - have entered the market.⁷⁰

4.1 What is Blockchain?

One of the most striking features of Blockchain is undoubtedly that it is a system which encompasses all the technology necessary for the creation and management of a single database, which enables transactions between different nodes in the same network. This sort of virtual portfolio, created to handle encrypted transactions, was born in 2008 along with Bitcoin - the first cryptocurrency used for online transactions - which over time has been joined by others. To date, there are hundreds of cryptocurrencies available on the market.

⁶⁷ Iyke Aru, *From Flying Money to Blockchain: How Remittance Industry Has Reached Turning Point*, Cointelegraph, 1 July 2017.

⁶⁸ Tavneet Suri, *Mobile Money*, Annual Review of Economics, Vol. 9, Palo Alto, 2017, pp. 497-520.

⁶⁹ See also https://www.theregister.co.uk/2017/08/03/itu_facts_and_figures_2017/

⁷⁰ Nir Kshetri, *Can blockchain technology help poor people around the world?*, The Conversation, 1 May 2017.

Although its official establishment was in 2008, the idea behind blockchain actually dates back many years. It was inspired by the method of exchange used on the island of Yap in Micronesia, nearly 1500 years ago.⁷¹

At that time, its inhabitants, following the example of the first rudimentary banks, began to mint the first stones called Rai. Their purpose was to allow commercial



Rai Stones on Yap Island

exchanges involving foreign exchange payments. However, the main problem with these new coins was their weight. The huge round stones weighted in fact almost four tons, making it impossible to transport them continuously. To remedy the problem, the entire population was provided with a register in which they would have to report ownership of each Rai stone and all commercial transactions carried out. All the information in the register was shared by all the inhabitants of the island, assessing at any time who was the owner of every single Rai stone. In this way it was impossible for anyone to spend the same currency twice or run the risk that others would illegally declare something their own property, since the economic situation of each individual was under the watchful eyes of the community. All this happened almost 1500 years ago, and incredibly it is the system that inspired the more modern blockchain and cryptocurrencies.⁷²

Blockchain, a term literally translated as a chain of blocks, carries out that same function of a shared register in the new era of the Internet. In really simple terms, all the transactions performed are recorded in blocks of data which are saved on all nodes of the network, similar to what happened with the ancient Rai stones.

The blockchain is a technology that allows the creation and management of a large distributed database for the management of transactions and it is shared between several nodes of a network. In a nutshell, the blockchain is represented by a chain of blocks that contain multiple transactions. Miners create blocks based on previous verified transactions in the blockchain. Each block in turn is also an archive for all transactions and is unmodifiable and therefore immutable. In addition to immutability, the other great feature of the blockchain is the use of

⁷¹ Gordon Stewart Parsonson, *The settlement of Oceania: an examination of the accidental voyage theory*, The Journal of Polynesian Society, Volume 71, 1962.

⁷² Lee C. Cora, *The Stone Money of Yap: a numismatic survey*, Smithsonian Studies in History and Technology, Washington, DC, 1975.

cryptographic tools to ensure security of each transaction and maximum resistance to tampering.⁷³

This is alternative to the traditional centralized logic, represented by the strictly centralized One-To-Many relationship, where everything must be managed by a centralized structure or authority or system. In a centralized ledger, trust is in "an authority" or system that represents the "Centre" of the organization. The decentralized ledger instead has no longer a "big" central subject but many "central subjects".

Organizations based on the decentralized ledger define governance that establishes forms of centralized coordination. The real change is represented by the distributed ledger, where the logic of governance is built around a new concept of trust among all the subjects. No one has the opportunity to prevail and the decision-making process passes strictly through a rigorous process of consensus building. The blockchain is doing with the transactions what the Internet has done with the information and it is doing it thanks to a process that combines distributed systems, advanced cryptography and game theory. Blockchain is not an application, it is not a system, and it is not a technology: it is a new paradigm for information management that allows securing the real immutability of the data by guaranteeing its history. Potentially, every form of transaction and collaboration can be supported and managed with the blockchain.⁷⁴

4.2 Cryptocurrencies

A cryptocurrency is a digital currency. Imagine that the Euro did not exist anywhere else except in a piece of code written on some server, this is a cryptocurrency: a virtual token that you can access by opening your computer. Each currency has its own evaluation that varies over time: this means that digital tokens can be converted with other currencies or used to buy items. In most cases, the spread of new tokens is sided so that they do not circulate too many, which would cause the immediate devaluation.⁷⁵ The blockchain network ultimately allows payments and transactions to be executed in real time, without the holders of currencies being forced to reveal their identity and with high levels of security. The history of the cryptocurrency is rather fascinating.⁷⁶ The first to be established, the Bitcoin, made its appearance in a forum of computer enthusiasts by a mysterious user who introduced himself with the pseudonym of Satoshi Nakamoto.⁷⁷

⁷³ Ian Dillon, *How Blockchain Can Make A Positive Impact On Global Issues*, Entrepreneur Middle East, 19 april 2017.

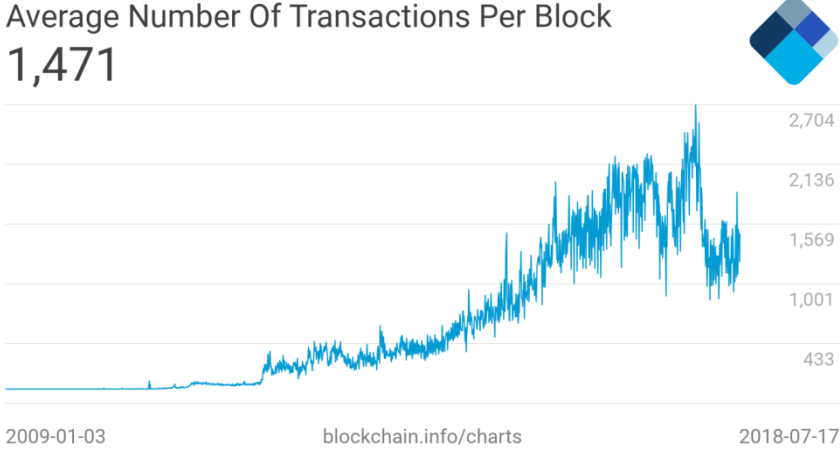
⁷⁴ Mandagolathur Raghu, *Remittance agents can advance with Blockchain technology*, *The National*, 5 April 2017

⁷⁵ George Harrap, *The truth about Bitcoin Remittances*, 24 December 2016.

⁷⁶ To know more about the history of cryptocurrencies, see <https://medium.com/@enbofficial/history-of-cryptocurrency-and-bitcoin-f82946ffa7e0>

⁷⁷ About Satoshi Nakamoto, see <https://www.economist.com/technology-quarterly/2018/09/01/satoshi-nakamoto-bitcoins-enigmatic-creator>

Blockchain based cryptocurrencies have the potentiality to disrupt the remittances industry, as a typical transfer takes a few minutes (around ten for Bitcoin) to be confirmed by the network. By avoiding all intermediaries – banks, agents, etc. – costs are significantly reduced. According to recent surveys, the use of blockchain-based technology in cross-border transactions may reduce costs by up to 60%. In the same way that Uber or Airbnb have disrupted



traditional business models, blockchain-based start-ups may find themselves in the same position if they succeed in convincing country regulators. Currently, strict banking regulations and unwillingness to work in "risky" sectors threaten to make it more difficult to modernize cross-border money transfers.⁷⁸ Blockchain is also considered a more secure way of saving and securing data, which can cut down fraud. Centralized SWIFT takes a longer time to process transactions, which makes it easier to compromise. For this reason, banks have to allocate capital to insure against risks, with the costs ending up being passed onto the consumer, while a blockchain-based cross-border money transfer would simply rearrange the same parties so they instantly receive the same information simultaneously. If there are any anomalies, the transaction will not be performed, leaving close to zero the chances for criminals to intervene. Clearly, the risk is not eliminated, but highly reduced, thus reducing also the costs passed to consumers, the very people that need that money the most.⁷⁹ Transactions are also fully traceable, giving customers the possibility of knowing where their money is and if it has been successfully received, in sharp contrast with current systems, where money seemingly disappears for few days after it has been sent. Blockchain technology is still in its youth, but disruption is inevitable, so gearing up to the knowledge and adapting quickly is the only way out, as the question is not if it will happen, but when and what it will look like.

Blockchain based companies take advantage of the Internet to enable a quick, secure and relatively cheap transfer of money across the globe. A private blockchain⁸⁰ may also offer benefits to banks that need to settle payments in the same currency between intermediaries and other banks; however there is no way to avoid FX markets if other currencies are involved. Banks concern with digital currencies is mainly related to risk management and the perception

⁷⁸ Iyke Aru, *From Flying Money to Blockchain: How Remittance Industry Has Reached Turning Point*, Cointelegraph, 1 July 2017.
⁷⁹ Tracey Durner, Liat Shetret, *Understanding Bank De-Risking and its Effects on Financial Inclusion*, Global Centre, November 2015.
⁸⁰ According to IBM: "The sole distinction between public and private blockchain is related to who is allowed to participate in the network, execute the consensus protocol and maintain the shared ledger. A public blockchain network is completely open and anyone can join and participate in the network. A private blockchain network requires an invitation and must be validated by either the network starter or by a set of rules put in place by the network starter". (The difference between public and private blockchain, <https://www.ibm.com/blogs/blockchain/2017/05/the-difference-between-public-and-private-blockchain/>)

that cryptocurrencies are anonymous. Barclays have become involved in blockchain since 2015, partnering with payment company Circle, without fear of being associated with a technology allegedly involved in the shadowy activities of the so-called "dark web".⁸¹

Before its establishment, any economic transaction would require an intermediary to facilitate trust between counterparts. Bitcoin was the first to solve the double spending problem. It also enables global interoperability independent from the platform used. Powered by blockchain, the public Bitcoin ledger is distributed among all users, meaning anyone can view it. Digital currencies have a unique set of use cases depending on the properties of the software, and some are used as a payment rail for value transfer. To send money between two countries requires first being able to convert local currency into Bitcoin, then sending the amount to the receiving country that needs to have exchange platforms with strong banking partners.⁸²

The European Commission has recently established a legal framework to regulate digital currencies with the 5th Anti-Money Laundering directive.⁸³ The new rules enact stricter transparency requirements directed at "virtual currency exchange platforms" for the purposes of money laundering or terrorist financing, increasing the cooperation and exchange of information between anti-money laundering and prudential supervisors, including with the European Central Bank.⁸⁴

4.3 Digital Remittances

Although still in its early development days, the cryptocurrency market has already reached the migrant population masses and promises massive potential in the future. At the moment, there are several companies actively offering digital money transfer based on Blockchain technology.

Thanks to the speed of innovation and subsequently declined cost of hardware, a vast number of developing countries are seeing an increase in smartphone ownership. This factor, connected with poor banking infrastructure and concern about national currency, has fuelled the exploitation of blockchain-backed digital payments. Blockchain-based companies promise to disintermediate corresponding banks from the settlement process; however, even if they may offer a greater convenience at either end of the transfer they still have to go through the banking system.⁸⁵

The distributed ledger technology is in its development stage, but it has the potential to become the settlement engine for a vast array of financial products, running simultaneously on millions of devices, offering a cheaper, more secure record-keeping than the banking system. Eventually

⁸¹ Robby Houben, Alexander Snyers, *Cryptocurrencies and blockchain. Legal context and implications for financial crime, money laundering and tax evasion*, European Parliament Study, June 2018.

⁸² Michael Taggart, *BitShares Taking Remittance Industry By Storm*, 6 December 2017.

⁸³ Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU.

⁸⁴ European Commission, *Strengthened EU rules to prevent money laundering and fight terrorism financing enter into force today*, press release, 9 July 2018.

⁸⁵ Michael Barr, Karen Gifford, Aaron Klein, *Enhancing anti-money laundering and financial access: Can new technology achieve both?*, Regulation and Markets, Brookings Institution, April 2018, Washington DC.

the whole idea of cross-border remittance will be gone, just like there is no such thing as cross-border email, or cross-border web browsing. Using cryptocurrencies as a settlement medium can be challenging initially, but with clear immediate advantages: transactions would be paid in real time, and businesses would not need to store enormous amounts of cash reserves in destination countries, avoiding the international wire system.⁸⁶



The first step to transfer money is finding a broker, called "first mile", who can exchange currency into the selected cryptocurrency. The First Mile transfers the amount to the Last Mile, who is in the receiving country. Although this operation is performed in a matter of minutes, in practice most companies prefer to simply pre-fund their balance in the selected cryptocurrency well in advance, allowing them to have only few large transactions instead of many during a single day. It may resemble to the traditional method, but the use of cryptocurrencies means avoiding banking waiting times and the unpredictable exchange rate with local currencies. In some cases, Last Milers act as First Milers for another corridor, letting the cryptocurrency flow freely from country to country, dispersing and reforming all across the region in an ever-expanding web of real-time settlement. Currently there are some drawbacks to using a cryptocurrency in the remittance industry because, surprisingly, it is not always the cheapest solution compared to other offerings, but blockchain technology may allow for much cheaper solutions in the long run. Big players like Western Union are working on their approach to blockchain, but still haven't delivered a significant business value and are not yet prepared to tear up their existing business, even if this is migrating to mobile or online social messengers.⁸⁷

⁸⁶ Kevin Rands, *How blockchain technology is disrupting the remittance industry*, CIO, 14 November 2017

⁸⁷ Luis Buenaventura, *Reinventing Remittances with Bitcoin*, Bloom Solutions, 2017.

4.4 Blockchain Based Remittances Companies

In the last years, a large number of blockchain based remittances start-ups were established in most parts of the world, particularly in South East Asia, each one with a creative solution to cross-border transfers.⁸⁸ Here some notable examples:



Abra is an American company founded in 2014. It first used the USA-Philippines corridor but soon expanded to cover more than 150 countries. It provides person-to-person money transfers through an app, letting users to store their cash directly on their mobile device or through an authorized "Abra teller", or letting those sending funds instantly with their smartphones. Bitcoin is used as back-end infrastructure; funds are denominated in US dollars, but during transactions they are quickly settled in the local currency on the other end. Like Uber drivers, Abra tellers act as "human ATM" and they are located by customers using the app. In this way the company is building an extensive network of agents without making expensive investments in infrastructure.

BitSpark is a Hong-Kong based company which offers a digital remittances service powered by the BitShares platform. It offers some peculiar features, which are not limited to speed and liquidity, as payment providers have to go through gatekeepers in order to access almost 200 world currencies, allowing them to trade their assets (value pegged to EURO, US\$, or CNY) on their decentralized exchange platform, therefore reducing the risk of reliance on a centralized

⁸⁸ William Suberg, *Alibaba Offshoot Trials First Blockchain Remittance to Philippines, Plans Global Expansion*, Cointelegraph, 25 June 2018

third party that can be compromised. BitSpark is currently serving the Asian regions, with a strong focus on Indonesia, Pakistan, Vietnam, and the Philippines.

Coins.ph is one of the first bitcoin wallet services which is vastly used as a mobile remittance service in particular in the Philippines. The technology is quite sophisticated, allowing door-to-door delivery or giving the possibility to send Bitcoins that can be retrieved directly from any Bitcoin ATM around the world. It can also convert the amount into local money and deliver it the next business day.

BitPesa is the first African digital money transfer company. Established in 2013 in Nairobi, Kenya, it is currently active in Nigeria, Tanzania, and Uganda. It was able to remove correspondent banks from the transaction chain relying on Bitcoin transfer and digital brokers who deposit the money in the currency of the receiving country.

Stellar instead decided to adopt another approach based on consensus, which speeds up transactions confirmations to a few seconds. Stellar is a non-profit, open source distributed payments infrastructure based on a hybrid blockchain. Founded in 2014 by Jed McCaleb (creator of eDonkey and Overnet) it allows money transfers through its own cryptocurrency named Lumen (XLM). Several non-profit organizations are implementing Stellar as a financial infrastructure, particularly in the developing world, including the Praekelt Foundation which integrated Stellar into its Vumi messaging app to enable young women in sub-Saharan Africa to save money. In recent years the company expanded in Africa and Asia, partnering with African mobile payment firm Flutterwave, and French remittances company, Tempo Money Transfer, which would allow people to send money from Europe to banks connected to the Stellar network.

A relevant initiative has been launched by the Bill and Melinda Gates Foundation⁸⁹ in 2017, an open source software called Mojaloop designed to deliver financial support to people living in areas undeserved by banks. Developed in cooperation with Ripple, Dwolla, ModusBox, Crosslake Technologies and Software Group, it relies on blockchain technology to share financial information. The software is easily accessible on GitHub⁹⁰ platform and it is not owned by the Gates Foundation. However, it will be used in the foundation's ongoing work to promote the development of pro-poor, digital payment platforms.

Other relevant enterprises are: Rebit a Philippine based company, owned by Satoshi Citadel Industries, a financial technology startup specialised in blockchain based financial products. Rebit allows users to transfer money directly in Bitcoin or to exchange them in local Philippines pesos for a small fee. CoinPip, a Singapore based company that allows customers to send money using a blockchain based technology. It is mainly used by migrants to send money back to China, Philippines, Indonesia, and India. Mexican Volabit mainly serves the Latin-American market. Toast is another Filipino company which allows overseas workers – mostly in Singapore and Hong Kong – to send money to their families without the need of owning a formal bank account. Californian ZipZap combines traditional bank payment and blockchain technology to

⁸⁹ Bill and Melinda Gates Foundation, <https://www.gatesfoundation.org/>

⁹⁰ GitHub is a web-based version-control and collaboration platform for software developers. This is the Mojaloop dedicated page: <https://github.com/mojaloop>

identify the most efficient and less expensive transfer option. Circle, on the other hand, uses Bitcoin for transfers but takes possession of funds without charging fees.⁹¹

⁹¹ Jessie Willms, *Blockchain-Based Remittance Companies Win at RemTECH Awards Ceremony*, Bitcoin Magazine, 22 June 2017.

5. Conclusion

Migrant remittances represent one of the most important financial flows for developing countries: they contribute to improving the conditions of people who live in poverty, stimulating the development of the most backward economies, and have an immediate and direct impact on their families and communities. At macroeconomic level, the inflow of remittances strengthens the national balance of payments of the poorest countries by reducing their debt to richer countries.

It is not a coincidence that the relevance of remittances has been formally acknowledged in “Objective 20” of the Global Compact for Safe, Orderly and Regular Migration, agreed this year by the United Nations member states. In fact, remittances are recognized as an important source of private capital that cannot be equated with any other international financial flow. Moreover, the Global Compact for Migration provides specific commitments from member states to increase the transparency and competition on the remittance transfer market and to establish a “conducive policy and regulatory frameworks that promote a competitive and innovative remittance market, remove unwarranted obstacles to non-bank remittance service providers in accessing payment system infrastructure”. It recognizes the role of remittances in the migrants’ integration process by promoting “financial literacy and inclusion of migrants and their families through education and training”, as well as the role of technology by “develop innovative technological solutions for remittance transfer, such as mobile payments, digital tools or e-banking, to reduce costs, improve speed, enhance security, increase transfer through regular channels and open up gender-responsive distribution channels to underserved populations, including for persons in rural areas, persons with low levels of literacy, and persons with disabilities”⁹².

This report aimed at offering a first integrated approach to understanding the potential opportunities, risks and challenges arising from the rapid development of Distributed Ledger Technologies (DLTs) in the international remittance industry, out of the various application areas.

Taking into account the recent increased volume of online cross-border credit transfers, corporate payments and interbank transfers, blockchain-based technology promises to transform the payments industry, speeding up processes and reducing global transaction costs, provided the technology is made accessible to all. Factors that explain the growing interest in this technological infrastructure, still in its early days, are the ability to record and archive all transactions that take place within a specific computer network, increasing their transparency, lowering customer verification costs (“Know your Customer”) and eliminating the need for a “trusted” third party (controllers, notaries or central institutes). In fact, it represents a horizontal and shared network which is part of the worldwide emerging trend of disintermediation, including in the financial services sector.

The cost for sending money abroad is still high, and the fees charged by the various money transfer agencies are particularly expensive and these costs are passed on the often fragile

⁹² United Nations, *Global Compact for Safe, Orderly and Regular Migration*, Final Draft, 11 July 2018.

migrant population. Compared to a few years ago, there has been a huge progress in terms of financial inclusion of foreigners, but much remains to be done, as many migrants send remittances to their home countries almost exclusively by informal channels or through the specialized money transfer agency that are outside the traditional banking system.

Technological advances have made smartphones accessible to a large majority of population at a cheaper price. The establishment of new forms of payment, no longer bound to the bank system, may improve migrant's money transfer, especially for those who are underserved or disfranchised by their local formal financial system. An increasing number of companies have begun using blockchain-based technology to speed up procedures and visibly lower financial costs are now borne by users. Although most large financial institutions and services are still reluctant to forego traditional currency and cash for the digital currency, a recent survey by the World Economic Forum⁹³ shows that 80% of banks will adopt blockchain for at least some activities in the next years. Among these, international payments and bank transfers stand out. A large-scale adoption in the next few years by the banking industry, according to the survey, could allow savings of between 15 and 20 billion dollars a year starting from 2022.

In that event, distributed ledger technologies could become a real breakthrough for achieving the 2030 Sustainable Development Goals' target of reducing the transaction costs of migrant remittances to less than 3% and eliminating remittance corridors with costs higher than 5%, as well as reaching large portions of the population without bank accounts and generally improving the lives of the over 250 million migrants in the world.

It should not be forgotten that the 2008 global financial crisis had particular negative repercussions on migrants' remittances, hitting emerging market countries severely, which represent the second source of external financing after the inflows of foreign direct investments, on average more than 3-4% of the gross domestic product. A steady flow of remittances would indeed limit the probability of a crisis due to the loss of official reserves and the aggravation of debt exposure abroad – for which DLTs are being considered as one possible solution.

For all these reasons, some migrant communities would need targeted (and strenuous) inclusion pathways. For instance, migrants' financial inclusion in Europe represents an often-neglected opportunity to activate virtuous processes in the financial infrastructure of the countries of origin, in particular in rural and remote areas. The ability of the financial system to intercept and contribute to the valorisation of remittance flows (in terms of financial leverage, productive and non-productive investments) therefore becomes essential and indispensable.

However, while there are many convincing benefits from using blockchain-based technology, there are also considerable negative associations with the technology itself, as it is perceived to lack the robustness of the formal financial infrastructure, also given the possible risks from non-compliance with Anti-Money Laundering and Counter Terrorism Financing regulations. Moreover, governments and regulators across the world are, in general, in disagreement about how best to respond to the challenges posed by blockchain and related crypto-assets. Therefore, a key issue

⁹³ World Economic Forum, *The impact of emerging technologies on the creative economy*, White Paper, February 2018.

in technology adoption and consequent cost reduction in remittance transactions could concern regulatory inertia and uncertainty – whose impact could be worth examining in future studies.

Ultimately, it is important to underline that remittances fulfil a promise to the country of origin, migrants' families and their community, and this may have many cultural implications. Even though remittances are not conceived as a typical form of savings, they represent to migrants the most precious possession in terms of affection.

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7. ANNEXES

Most used extra-EU corridors.

Sending Country	Receiving Country	Total Average Cost Percent (%)
Austria	Bosnia and Herzegovina	6.89
	Kosovo	7.12
	Serbia	7.48
	Turkey	7.28
Belgium	Algeria	9.95
	Congo, Dem Rep	7.74
	Morocco	5.58
	Turkey	8.15
Czech Republic	Ukraine	10.50
	Vietnam	8.68
France	Algeria	9.48
	Cameroon	4.25
	China	7.81
	Comoros	4.54
	Cote d'Ivoire	5.55
	Haiti	8.88
	India	7.33
	Lebanon	7.55
	Madagascar	5.99
	Mali	5.16
	Morocco	4.86

	Senegal	4.96
	Serbia	8.18
	Togo	5.48
	Tunisia	6.96
	Vietnam	7.94
Germany	Afghanistan	10.58
	Albania	6.91
	Ghana	7.44
	Morocco	6.39
	Nigeria	7.22
	Tajikistan	6.82
	Thailand	9.81
	Togo	9.52
	Turkey	8.09
	Vietnam	8.22
Italy	Brazil	7.06
	China	8.15
	Ecuador	4.91
	Egypt	6.25
	Ethiopia	6.83
	India	4.39
	Morocco	6.06
	Nigeria	8.39
	Philippines	5.67
	Senegal	5.41
	Sri Lanka	4.83

	Tunisia	9.91
	Ukraine	5.63
The Netherlands	Dominican Rep	7.81
	Ghana	7.64
	Indonesia	9.25
	Morocco	5.87
	Nigeria	7.11
	Somalia	6.07
	Suriname	7.99
	Turkey	6.80
Portugal	Brazil	5.82
	Cabo Verde	8.32
	Mozambique	5.92
Spain	Bolivia	4.64
	Brazil	5.88
	China	12.51
	Colombia	5.24
	Dominican Rep	5.14
	Ecuador	5.02
	Honduras	5.84
	Morocco	4.95
	Nigeria	7.41
	Peru	4.44
	Philippines	5.48
Sweden	China	5.72
	India	6.02

	Lebanon	8.97
	Somalia	9.84
United Kingdom	Afghanistan	10.68
	Bangladesh	4.46
	Brazil	7.26
	China	6.54
	Eritrea	12.77
	Ethiopia	9.66
	Gambia	11.07
	Ghana	5.60
	India	3.39
	Jamaica	7.56
	Kenya	5.38
	Nepal	6.41
	Nigeria	5.80
	Pakistan	4.68
	Philippines	5.36
	Rwanda	10.29
	Sierra Leone	8.79
	Somalia	6.38
	South Africa	7.98
	South Sudan	10.75
	Sri Lanka	4.65
	Tanzania	9.71
	Thailand	9.80
	Uganda	7.27

Vietnam	8.25
Zambia	12.84
Zimbabwe	7.09

Source: World Bank

7.1 List of mentioned Blockchain-based Money Transfer Companies.

Ripple: <https://ripple.com>

Bitpesa: <https://public.bitpesa.co>

Coinspark: <https://coinspark.io>

Abra: <https://www.abra.com>

Coin.ph: <https://coin.ph>

Stellar: <https://www.stellar.org>

Rebit: <https://rebit.ph>

Coinpip: <https://www.coinpip.com>

Volabit: <https://www.volabit.com>

ZipZap: <https://zipzap.me>

Circle: <https://www.circle.com>

Mojaloop: <http://mojaloop.io/>

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