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The Economic and Social Impact of the Novel Coronavirus (Covid-19) on Migrant Remittances: An Overview of Tunisia and Morocco

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The Economic and Social Impact of the Novel Coronavirus (Covid-19) on Migrant Remittances: An Overview of Tunisia and Morocco.

Hajer Habib[1]

Abstract:

The spread of the novel coronavirus and 'stay at home' measures in response to this global health crisis is profoundly changing societies and economies around the world. The objective of this work is to analyze the economic impact of Covid-19 by focusing on their implications on migrant remittances flows in Tunisia and Morocco. Indeed, we analyze in which countries, where individuals depend on remittances and where this dependence intersects with economic vulnerability and inadequate financial infrastructure. We use micro-data from the Afrobarometer survey, wave 2016-2018. Based on Principal Component Analysis (PCA), the results show that the decline in remittances will exacerbate economic difficulties during the crisis for individuals who depend on remittances. In Tunisia, 60% of individuals who say they are dependent on remittances are unemployed and 46% of those who say they are dependent on remittances face a lack of liquidity. In Morocco, 63% and 43%, respectively the share of individuals who say they are dependent on remittances are unemployed and the share with liquidity problems. Also, "stay at home" measures are likely to limit the ability of individuals to receive funds from abroad. Both countries have similar access to infrastructure, more than 46% of people who depend on remittances do not have a bank account and 37% do not have access to the internet. They would therefore be less able to adapt to a restriction on in-person remittance services during a lockdown to contain the Covid-19 virus. For this reason, the paradigm shift from cash to digital money is necessary.

Keywords: Remittances, Covid-19, Economic vulnerability, Principal Component Analysis (PCA).

Jel classification: F22, F24, O15, I10, R2

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I. Introduction

Countries around the world have imposed restrictions on mobility and locked down a large part of their societies to try to limit the spread of the new virus. This will have serious repercussions on the world's economic prospects. The OECD (2020) records a halving of the annual rate of global economic growth in 2020. The IMF (2020) predicts a contraction of the world economy by 3% in 2020. Similarly, the potentially significant impact of the Covid-19 crisis is hitting the flow of remittances following mobility restrictions that prevent individuals to meet providers of remittance services in sending and receiving countries (Asare et al. (2020) Bisong et al. (2020), Gagnon (2020), World Bank (2020)). According to the World Bank (2020), migratory remittances are expected to experience an unprecedented decline in recent history to 19.9%. This collapse is equivalent about $ 110 billion. Removing a major source of income for many developing countries, their ability to cope with and come out of the crisis is severely affected.

Tunisia has experienced a growth in remittances in recent years, particularly from European countries. This improvement has started to bear fruit in the development of the country. Tunisia recorded a share of remittances in GDP of 4.9% in 2019. This progress will certainly be interrupted by the Covid-19 pandemic. While the global economic slowdown is expected to have significant repercussions on the Tunisian economy as it moves into its deepest recession. The Tunisian National Institute of Statistics (INS) shows a decline in GDP of about 21.6% during the second quarter of 2020. This high loss is the result of the total lockdown imposed on the country to contain the pandemic. Therefore, this research work assesses the potential impacts of the expected reductions in this remittance flow using Tunisia and Morocco as a case study.

Although, the Covid-19 virus spread to Africa later than to Asia or Europe, as of November 12, 2020, 81003 cases have been detected and 2396 deaths recorded in Tunisia[2] and 296189 cases have been detected and 4850 deaths in Morocco[3]. The decline in remittances is considered among the main exogenous impacts of Covid-19 on global economies. A decline of this magnitude is likely to affect some populations differently than others. The greatest impact can be expected for individuals who are more dependent on remittances, and where this dependence intersects with economic difficulties and an infrastructure deficit to adapt to the crisis.

In the context of the Covid-19 epidemic, the question addressed in this research work is the following: What are the socio-economic impacts of the new coronavirus on the outlook for the flow of migratory remittances?

Until now, the majority of research on the relationship between remittances and the Covid-19 crisis has been based on aggregate indicators such as remittance flows. Our analysis is based on

[2] Data from the Tunisian Ministry of Health, accessed November 12, 2020.

[3] Data from the Moroccan Ministry of Health, accessed November 12, 2020.

micro-data from the Afrobarometer[4] survey that allows us to examine the characteristics of individuals who receive remittances. We compare two North African countries where their economic situations are very similar and in order to avoid saying that one country is intrinsically more or less vulnerable to the crisis generated by Covid-19 than the other.

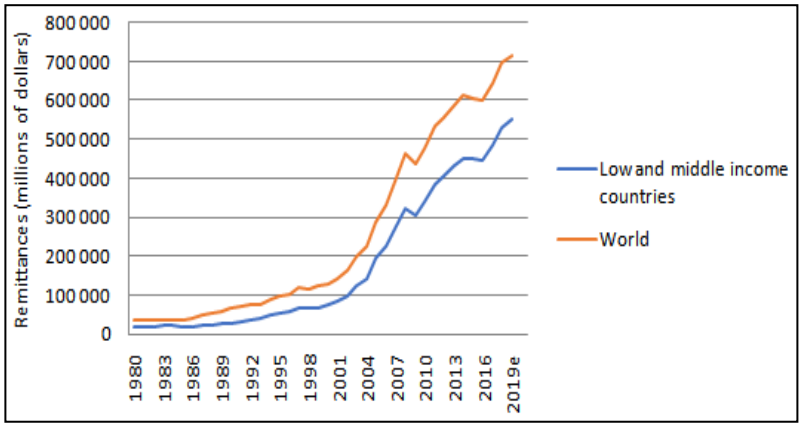
The paper will be structured into four sections. The next section will focus on the magnitude of the expected decline in remittances and compare with previous crises. The third section will examine the dependency on remittances. Then, we will make a comparison between Tunisia and Morocco based on composite indicators. And, the last section will conclude the work.

II. The extent of the decline in remittances in 2020.

Remittances are among the main drivers of economic growth and poverty reduction in several developing countries. In recent decades, remittances received from migrants working abroad have steadily increased, from $ 36 billion in 1980 to nearly $ 714 billion in 2019. They are a major source of foreign exchange receipts in low- and middle-income countries (72% of the total) (Figure 1). According to the African Union (2020), migratory remittances have been the main source of international financial flows to Africa since 2010, accounting for about a third of total external financial inflows. It should be noted that these figures refer to official data on formal remittances. However, if we take into account informal channels for transferring money, the real value of remittances is certainly much higher to developing countries (Freund and Spatafora (2005)).

In 2019, remittances from migrants represent a significant share in the GDP of several developing countries (more than 10% of GDP). They exceed foreign direct investment (FDI) as the main source of external financing. Unlike other private capital flows that tend to decline during downturns, remittances tend to be stable and increase during periods of economic downturn and natural disasters (Yang (2006)), meaning that they can be an important development lifeline supporting crisis adaptation (Radha (2005), Gagnon (2020), World Bank (2020)).

Figure 1. Remittances in absolute numbers 1980-2019.

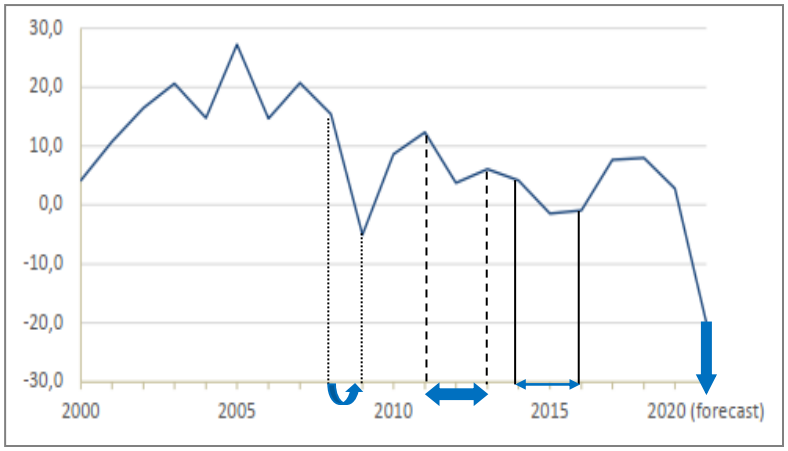


[4] The survey collects nationally representative samples of 1200 observations per country. The dataset used in this study comes from the 2016-2018 wave of the Afrobarometer survey, which was published in 2019. It is available on : https://dial.ird.fr/enquetes-statistiques/enquetes-afrobarometre

Source: Author's presentation based on World Bank data (2020)

The term "countercyclical"[5] of remittance flows loses its meaning today. The World Bank (2020) predicts a significant reduction in this global flow resulting from the spread of Covid-19, from $ 714 billion in 2019 to $ 572 billion in 2020, a decline of 19.9%. In low- and middle-income countries, the projected decline is from $ 554 billion to $ 445 billion, a decrease of 19.7%. This decrease will be unprecedented in the recent remittance history (Figure 2). Since 2000, the 5% drop in remittances occurred during the global financial crisis of 2008-2009 (Figure 2). The expected fallout from the spread of Covid-19 in 2020 would overshadow this. A significant decrease in remittances will be due to lower wages for migrant workers in countries affected by Covid-19 and the impact of containment and lockdown measures on people's ability to access the remittance service.

Figure 2. Variation in remittances (%) between 2000-2020.



Source: Author's presentation based on World Bank data (2020).

The previous figure also shows that the impact of Covid-19 on remittances and on the households receiving these flows varies from one crisis to another. Figures on remittance flows from previous pandemics show a mixed set of trends. Thus, the remittance flows are affected by the A.H1N1 influenza crisis originating in Mexico, which lasts from 2009 to 2010 (the period of the global financial crisis), the respiratory syndrome crisis in the Middle East (MERS- CoV) which was first detected in 2012 in Saudi Arabia and the Ebola virus disease (EBOV) epidemic in West Africa in 2013. During all these crises, remittances have declined, but with different percentages. For example, during the H1N1 crisis, the world's first migration corridor, the United States/Mexico recorded the largest decrease in remittances. There is a slight decline in the inflows and outflows of remittances from Saudi Arabia during the MERS outbreak. And, a decline in the amount of remittances to Guinea (originating from the disease) during the Ebola crisis between 2014-2015. However, the experiences of previous pandemics are geographically concentrated in particular countries or regions. On the other hand, the Covid-19 crisis has acquired a global reach since the measures banning mobility in

[5] See Mouhoud M. (2016)

most countries of the world, along with a decrease in jobs for migrant workers, lead to a reduction in international migration, which reduces the number of migrants sending remittances to their countries of origin (Clemens (2020)). This decline in the remittance flows will have different implications for countries affected by the health crisis.

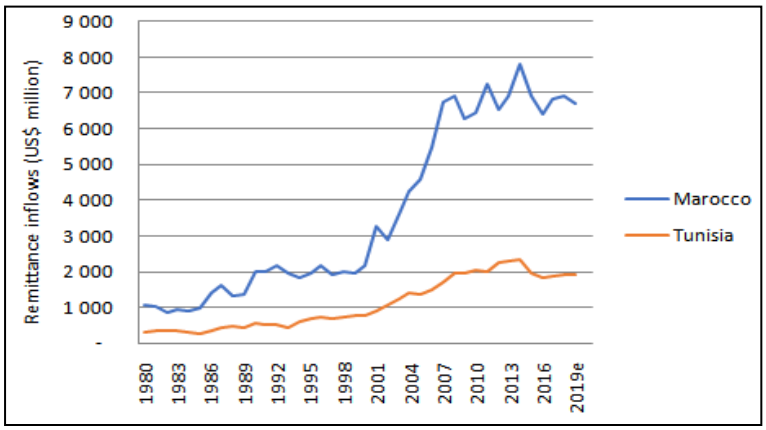
As a result, analyzes made of the potential implications of the Covid-19 crisis on remittances remain on a global scale. In our study, we try to focus on a cross-country comparison (Tunisia and Morocco) and examine macroeconomic data from the World Bank and microeconomic data from the Afrobarometer survey.

III. Are Remittances a Vicious Cycle of Economic Dependence[6]?

The available data on remittances and on existing recipient individuals in countries of origin indicate which countries are most vulnerable to the expected decline in remittances resulting from the Covid-19 crisis. We analyze whether this decline has a significant economic impact in countries characterized by a higher proportion of remittances in their GDP. As well, we can expect if the decline in remittances will have a significant impact on the households that depend on them the most, and on those who have cash shortages.

The World Bank (2020) shows that, since 2013, remittances have exceeded foreign direct investment (FDI) in the Middle East-North Africa (MENA) region. In 2019, Morocco and Tunisia are among the countries in the region that received significant amounts of migratory remittances, (Morocco $ 6669 million and Tunisia $ 1902 million). In terms of GDP, remittances have been estimated at about 5.6% of GDP in Morocco and 4.9% of GDP in Tunisia.

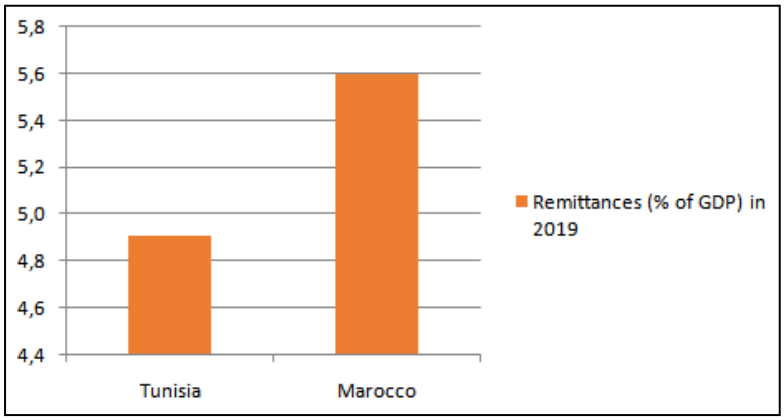
Figure 3. Remittances inflows to Tunisia and Morocco in 2019 (US$ million).



Source: Author's presentation based on World Bank data (2020).

[6] See Chami and al. (2018).

Figure 4. Remittances to Tunisia and Morocco in 2019 (as % of GDP).



Source: Author's presentation based on World Bank data (2020).

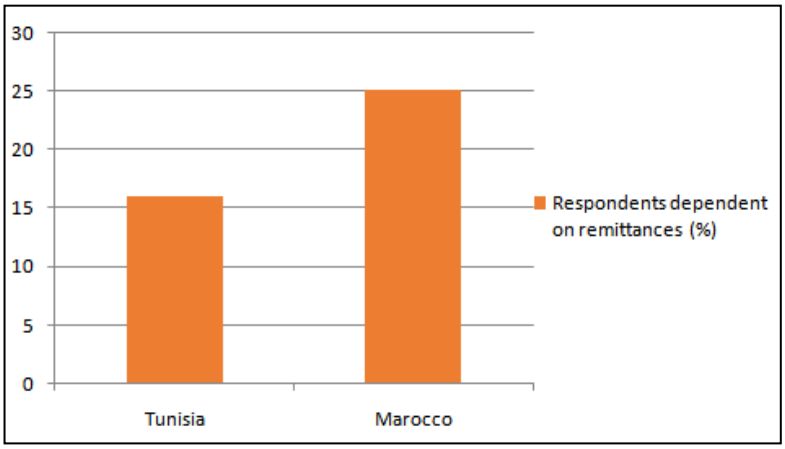
Remittances to Tunisia and Morocco come from different countries of origin, mainly Europe. A more diversified remittances flow in terms of countries of origin may be better protected against the effects of the Covid-19 pandemic than it has not affected all countries to the same degree simultaneously.

Some recipient households see migratory remittances as a lifeline when there are money problems (Radha (2005)). Individuals dependent on remittances are the respondents to the Afrobarometer survey question if they receive remittances and to what extent they depend on them[7]. Individuals who consider themselves dependent on remittances may respond "A little bit", "Somewhat" and "A lot". The sum of these three responses indicates the proportion of the population that depends on remittances. We assume that these individuals are more likely to see their economic situation negatively affected by a sudden decline in remittances due to the Covid-19 crisis.

As shown in figure 6, Morocco registers a share of more than 25% of respondents saying they are highly dependent on remittances. For Tunisia, the proportion of individuals declaring to be dependent on it is only 16% of respondents.

[7] The survey question: Considering ALL the activities you engage in to secure a livelihood, how much, if at all, do you depend on receiving remittances from relatives or friends living in other countries? The possible answers are: Not at all = 0, A little bit = 1, Somewhat = 2, A lot = 3, Don't know = 9.

Figure 5. Dependence on remittances.



Source: Author's presentation based on Afrobarometer survey data.

As part of its assessment of "lived poverty" (Mattes (2020)), the survey indicates that the individuals who report dependence on remittances are the most or the least economically vulnerable[8], depending on their labor market[9] situations and the lack of money problems that may be faced[10]. If remittances are interrupted, we assume that individuals who are unemployed and with cash flow problems may be considered more vulnerable as they lose a potential safety net to solve these problems.

Figures 7 and 8 present the distribution of the share of the Tunisian and Moroccan population who declare to be dependent on remittances by labor market status (with employment and without employment)[11] and by incidence of liquidity problems. In the context of the coronavirus pandemic, many jobs are at risk. More than 60% of individuals dependent on remittances, say they do not have a job in both countries. As well as the majority of individuals dependent on remittances report that they have had no liquidity problems in the previous year (more than 50% of respondents). On the other hand, the proportion of individuals dependent on remittances who said they still have problems with lack of money is around 20% of respondents in Morocco and 16% of respondents in Tunisia. This underscores how vital remittances are for these individuals, as they are less able to solve these problems without foreign income.

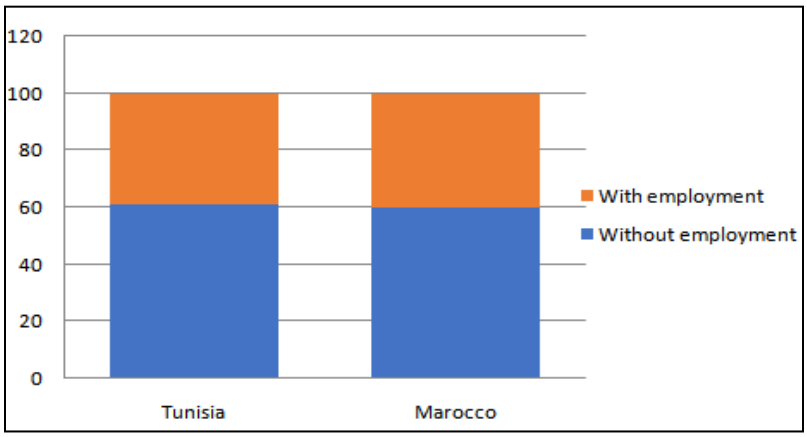
[8] The concept of economic vulnerability is the risk of a country's development being hampered by natural shocks (Adger and Kelly, 1999). The economic vulnerability here is not only the share of individuals dependent on remittances in different countries who face liquidity problems, but also the share of those unemployed individuals.

[9] The survey question: "Do you have a job that pays a cash income? [If yes:] Is it full time or part time? [If no:] Are you currently looking for a job?". The possible answers are: No, not looking=0; No, looking=1; Yes, part time=2; Yes, full time=3; Don't know=9.

[10] The survey question: "Over the past year, how often, if ever, have you or anyone in your family: Gone without a cash income? The possible answers are: Never=0; Just once or twice=1; Several times=2; Many times=3; Always=4; Don't know=9".

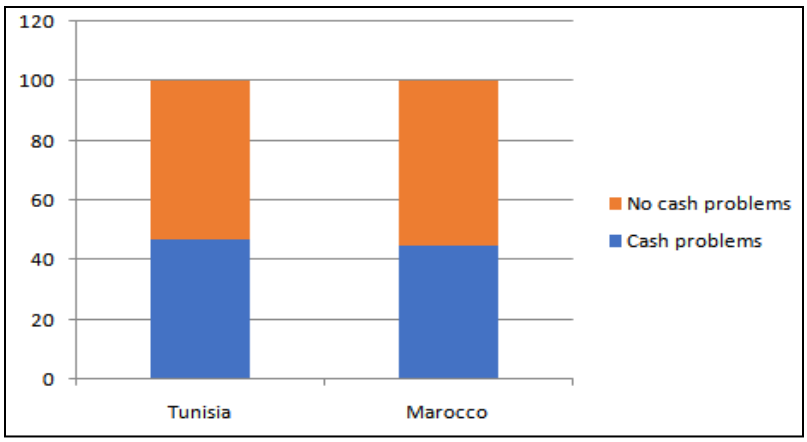
[11] The share of respondents "with employment" includes those who report on a situation of full-time and also part-time employment.

Figure 6. Employment status of those dependent on remittances.



Source: Author's presentation based on Afrobarometer survey data.

Figure 7. Shortage of liquidity reported by those who depend on remittances.

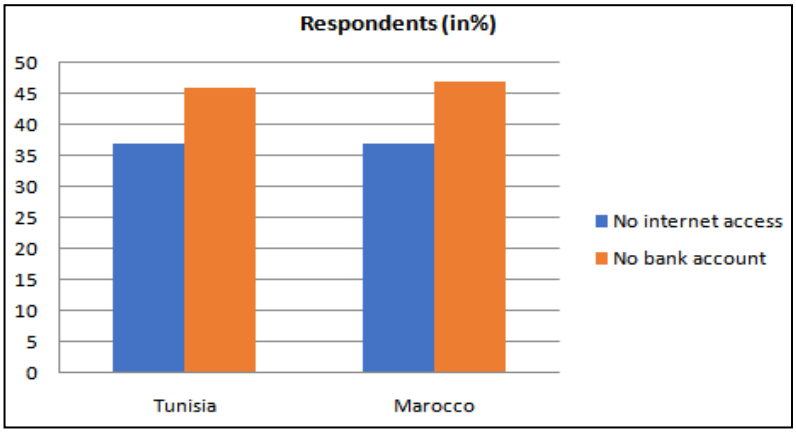


Source: Author's presentation based on Afrobarometer survey data.

On the financial infrastructure side, bank and money transfer operator closures have been reported in several countries around the world during the Covid-19 crisis (Miles (2020), Win and Barkawi (2020), Zaatari (2020)). These measures have an influence on the amounts of remittances as they can affect individuals to meet with intermediaries and remittance service providers. Thus, the economic effects of Covid-19 worsen with the problems of inadequate infrastructure in a country. The individuals who receive remittances, but do not have internet or a bank account access, will have fewer opportunities to receive remittances if mobility is blocked in their country. Bisong and al. (2020) indicate that the transition to digital remittances is needed as a solution to this challenge. This type of remittance does not require individuals to physically go to an office and respond to containment measures. Also, the authors show that digital remittances are often less expensive than other forms of remittance, according to the World Bank, perhaps 50% cheaper than traditional remittance tracks. The availability of the digital infrastructure for sending and receiving funds depends on a bank account and an internet connection.

According to the responses to Afrobarometer's[12] questions, figure 9 shows that nearly half of individuals who receive remittances declare they do not have a bank account (46% in Tunisia and 47% in Morocco). Thus, a proportion of about 37% of individuals who depend on remittances do not have access to the internet via a mobile phone in both countries (Tunisia and Morocco). In this way, in these two countries where remittances represent a high proportion of the GDP, access to the internet and to bank accounts is not widely available. This does not allow residents of these countries to adapt the way they receive remittances to the restrictions imposed during a Covid-19 lockdown.

Figure 8. No bank account, no Internet access among those who depend on remittances.



Source: Author's presentation based on Afrobarometer survey data.

IV. Methodology: Construction of composite indices.

The previous section describes the dependence on remittances, the potential economic vulnerability, and the inadequacy to digital infrastructure. Indeed, the variables are complex and remain difficult to interpret. At this level, the construction of composite indicators[13] makes it possible to overcome this complexity. The OECD (2008) and Chiappini (2012) show that the composite indicator is formed when individual components are combined into a single aggregate variable. We construct three composite indices according to the availability of the survey data used:

Table 1. Components of composite indices.

Composite indices	Components
1) Dependence on remittances (DR)	**DR1:** Share of the population dependent "A little" on remittances. **DR2:** Share of the population dependent "Somewhat" on remittances. **DR3:** Share of the population dependent "A lot" on remittances.

[12] The survey question: "Which of these things do you personally own: Bank account? [If "No":] Does anyone else in your household own one?". The possible answers are: No, don't own=0; Yes, someone else owns=1; Yes, do own=2; Don't know=9.

The survey question: "Which of these things do you personally own: Mobile phone? [If "Yes" to personally owning a mobile phone:] Does your phone have access to the Internet?". The possible answers are: No, does not have internet access=0; Yes, has internet=1; Don't know=9.

[13] See Kalantaryan et McMahon (2020)

2) Economic vulnerability (EV)	**EV1:** Share of the population dependent on remittances, facing cash problems "Sometimes" per year. **EV2:** Share of the population dependent on remittances, facing cash problems "Several times" per year. **EV3:** Share of the population dependent on remittances, facing cash problems "Always" **EV4:** Share of the population declaring to be dependent on remittances and unemployed.
3) Inadequate infrastructure (II)	**II1:** Share of the population dependent on remittances, without a bank account. **II2:** Share of the population dependent on remittances, resides in areas without a bank[14]. **II3:** Share of the population dependent on remittances, without access to internet by mobile phone.

Source: Author's presentation based on Afrobarometer survey data.

When the composite index is derived from different distributions, normalization of the basic components of this index may be necessary. The data normalization method is used so that the variables, measured at different scales, have comparable values. This method consists of normalizing the basic components to bring the data on the scale of 0 to 1 by subtracting the minimum and dividing by the maximum of all observations (Daumas (1982)). Each basic component $X_{(j)}$ for a country j has been transformed into:

$$N_{(j)} = (X_j - \text{Min}_{X_j}) / (\text{Max}_{X_j} - \text{Min}_{X_j})$$

With: Min_{X_j} and Max_{X_j} are the minimum value and the maximum value of the basic component $X_{(j)}$ in country j (Tunisia and Morocco). The normalized components are between 0 (the lowest level of dependency remittances) and 1 (the highest level of dependency remittances).

Table 2. Descriptive statistics.

Composite indices	Basic components	Observation	Mean	St-dev	Min	Max
Dependence on remittances	DR.1	2	0.115	0.212	0.1	0.13
	DR.2	2	0.055	0.212	0.04	0.07
	DR.3	2	0.25	0.0070	0.02	0.03
Economic vulnerability	EV.1	2	0.205	0.212	0.19	0.22
	EV.2	2	0.045	0.0070	0.04	0.05
	EV.3	2	0.04	0.0282	0.02	0.06
	EV.4	2	0.625	0.0494	0.59	0.66
Inadequate	II.1	2	0.365	0.0070	0.36	0.37

[14] The sampling unit / enumeration area is randomly selected after the national sample is stratified by the main subnational unit of government (province, region, etc.) and by location (urban or rural). The survey dataset provides a set of characteristics of the area to which the respondent belongs (eg.: the availability of a bank).

infrastructure	II.2	2	0.49	0.141	0.48	0.5
	II.3	2	0.37	0.155	0.26	0.48

Source: Author's calculation.

We use Bartlett's sphericity[15] test to test the correlation of the basic components. The higher the correlation, the higher the probability that the basic components are globally dependent.

Table3. Correlation matrix of the basic components of the composite indices.

Composite indices	Basic components	DR.1	DR.2	DR.3	EV.1	EV.2	EV.3	EV.4	II.1	II.2	II.3
Dependence on remittances	DR.1	1									
	DR.2	**0.3**	1								
	DR.3	**0.5**	**0.6**	1							
Economic vulnerability	EV.1	0.05	-0.1	-0.25	1						
	EV.2	-0.08	-0.03	0.1	**0.1**	1					
	EV.3	0.1	0.11	0.2	**0.08**	**0.46**	1				
	EV.4	0. 3	0.2	0.28	**0.21**	**0.3**	**0.6**	1			
Inadequate infrastructure	II.1	-0.02	-0.06	0.01	0.01	0.63	0.51	0.4	1		
	II.2	-0.01	-0.1	-0.01	0.05	0.74	0.4	0.5	**0.8**	1	
	II.3	0.15	0.18	0.2	-0.07	0.4	0.24	0.3	**0.31**	**0.4**	1

Source: Author's calculation based on Afrobarometer survey data.

Based on the correlation matrix, we find that all the basic components of the composite indices are positively correlated with each other. The correlations between the basic components of the infrastructure inadequacy and the dependence on remittance are stronger than the correlation between the basic components of the economic vulnerability index. These basic components correctly measure the three composite indicators.

In order to construct a composite index, we rely on Principal Component Analysis (PCA), a multivariate statistical technique which consists in transforming correlated variables making it possible to reduce the number of observed variables to a smaller number of new variables (e.g. example the three basic components describing the composite variable, dependence on remittances). Indeed, each composite index constructed through the sum of the basic indicators, each multiplied by the corresponding squared coefficients taken from the PCA analysis. Table (4) and figure (10) below describe the results obtained:

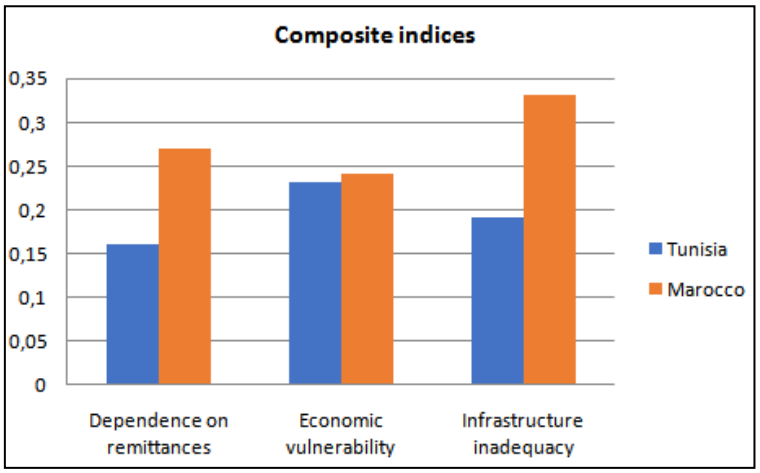
Table 4. Composite indices, Principal Component Analysis (PCA).

Country	Composite indices		
	Dependence on remittances	Economic vulnerability	Infrastructure inadequacy
Tunisia	0.16	0.23	0.19
Marocco	0.27	0.24	0.33

Source : Author's calculation.

[15] The Bartlett Sphericity Test is a statistical test relating to the overall independence of the components of a random vector. The test concerns the validity of H(0): the variables are globally independent and H (1): the variables are globally dependent.

Figure 9. Composite indices, Principal Component Analysis (PCA).



Source: Author's presentation based on Afrobarometer survey data.

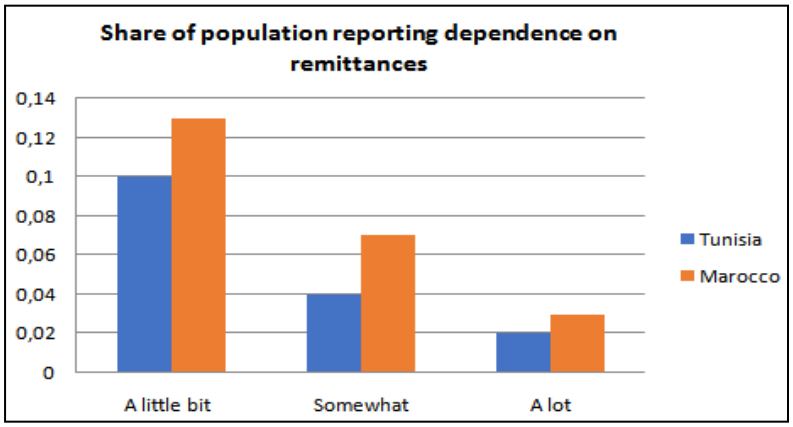
The remittance dependency indicator measures the share of the population that reported being dependent on remittances. It ranks countries from least to the most dependent on remittances. Scores closer to 1 show a greater depending on remittances, while scores closer to 0 shows less dependence on remittances. The results for Tunisia and Morocco are shown in the graph (9). Morocco records the highest score (0.27) compared to Tunisia (0.16). The Moroccan population is considered to be the most dependent on remittances.

Table 5. The basic components of the composite index, Dependence on Remittances.

Country	Share of population reporting dependence on remittances		
	A little bit	Somewhat	A lot
Tunisia	0.1	0.04	0.02
Marocco	0.13	0.07	0.03

Source : Author's calculation.

Figure 10. Composite Indicator, Dependence on Remittances.



Source: Author's presentation based on Afrobarometer survey data.

The shutdown of remittances to households existing in countries of origin during the Covid-19 crisis removes a safety net when individuals face liquidity problems and are unemployed. These individuals can be considered economically more vulnerable.

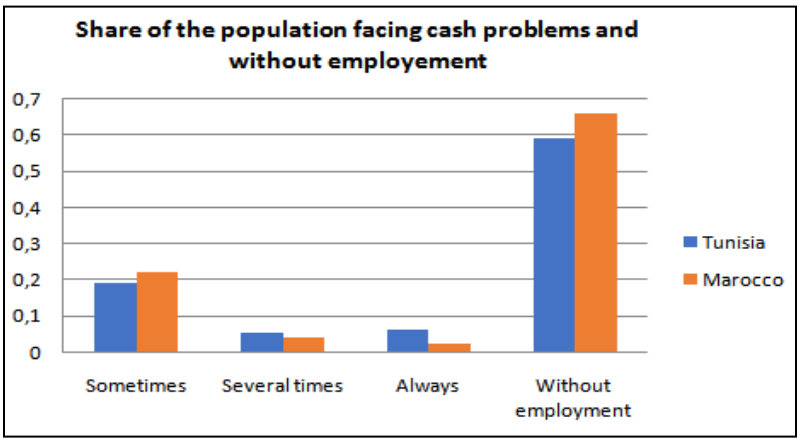
The Economic vulnerability index ranks countries from least to the most vulnerable in terms of the economic situation of individuals dependent on remittances. Graph (9) summarizes that Tunisia and Morocco have lower economic vulnerability scores respectively 0.23 and 0.24. Indeed, if we analyze the figures of the main components of the index, we find that the share of the Moroccan and Tunisian population dependent on remittances and unemployed has higher scores respectively 0.66 and 0.59.

Table 6. The basic components of the composite index, Economic vulnerability.

Country	Share of population facing cash problems			Employment status
	Sometimes	Several times	Always	Without employment
Tunisia	0.19	0.05	0.06	0.59
Marocco	0.22	0.04	0.02	0.66

Source : Author's calculation.

Figure 11. Composite indicator: Economic vulnerability.



Source: Author's presentation based on Afrobarometer survey data.

In a context of "staying at home" in response to the Covid-19 crisis, individuals who do not have access to the internet, to a bank account or to a bank are considered to be in a situation of increased financial exclusion. They will have fewer digital tools to adapt the way they receive remittances. The inadequate infrastructure index shows the extent to which the share of the population reporting dependence on remittances has access to banking services and the internet. For this index, we used the following basic components: the share of individuals with their own bank account, the share of individuals residing in areas with a bank and the share of individuals with access to the internet by mobile phone. It ranks countries according to the level of digital and financial inadequacy from lower level to higher level in terms of the extent to which individuals dependent on remittances have access to digital infrastructure.

Using graph (9), we conclude that in a context of social distancing measures to surround the spread of the virus, individuals dependent on remittances in Morocco may be less likely to be able to continue receiving remittances from abroad (total score recorded of this composite index is equal to

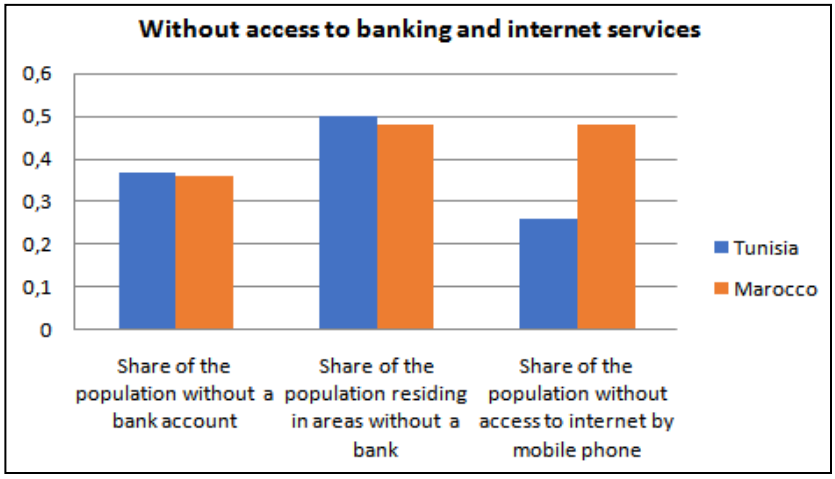
0.33). On the other hand, individuals dependent on remittances in Tunisia are better placed to be able to adapt to the health crisis in their country by having access to digital and financial infrastructure that will allow them to receive remittances without leaving their home (recorded score is 0.19). Also, table (7) shows that the score of the basic component of the index, the share of the population residing in zones without a bank for Tunisia and Morocco is high and registers, respectively 0.5 and 0.48. Thus, in the case of Morocco, the score for the share of the population without access to the internet by mobile phone is about 0.48.

Table7. The basic components of the composite index, Inadequate infrastructure.

Country	Access to banking services		Access to internet by mobile phone
	Share of the population without a bank account	Share of the population residing in areas without a bank	Share of the population without access to internet by mobile phone
Tunisia	0.37	0.5	0.26
Marocco	0.36	0.48	0.48

Source : Author's calculation.

Figure 12. Composite indicator, Inadequate infrastructure.



Source: Author's presentation based on Afrobarometer survey data.

V. Conclusions and policy implications:

Covid-19 and the lockdown to contain it present difficult choices. It is widely recognized that the current health crisis will have major implications for migrant flows and their remittances. According to the World Bank (2020), a decline of about 20% in remittances is recorded globally. In a context of broader economic decline as governments seek to contain the virus, a decline in remittances, which would be unprecedented in recent history, will remove a safety net for many poor and vulnerable families in developing countries. Thus, this decline can have a major impact on individuals and households, even in countries that do not receive particularly large remittance inflows at the macroeconomic level.

In order to reflect on the potential implications of the Covid-19 crisis on migrant remittances, we draw on Afrobarometer survey microeconomic data. Using a comparative study between Tunisia and Morocco, we described in which countries individuals are more or less dependent on remittances, and to what extent these populations dependent on remittances are potentially economically vulnerable in a context of "staying at home" in their country. Our results reveal the greatest convergence of remittance dependence, economic vulnerability, and inadequate infrastructure in two countries considered by our study. The fact that many Tunisians and Moroccans depend on remittances leaves them in a vicious cycle of economic vulnerability. Thus, individuals who depend on remittances face more economic shortages and have fewer financial and digital resources. However, the increased use of digital money sending services is seen as a potential benefit to exiting the crisis, as its services are often cheaper and have less risk of spreading the Covid-19 virus than in-person services which are feared as a potential route of contagion.

The frequency with which citizens find themselves without cash underlines the need for social protection measures to protect families from the shocks induced by the national lockdown. Also, given the significant impacts of remittances on developing economies and recipient households, it will be important to facilitate the flow of migratory funds. Receiving and sending countries should continue to recognize remittance service providers as one of the "essential businesses" to enable migrants and families to conduct seamless transactions during the crisis. Also, technology plays a crucial role in helping families by supporting sending remittances through online and digital channels. For this reason, the government can encourage and support digital remittance service providers. This requires actions to promote financial and digital culture in beneficiary communities and improve internet connectivity. Likewise, there is still a lack of information to understand how remittances circulate during crises, particularly at the micro level (migrants and beneficiary households). It will be important to pilot and establish a monitoring system that can inform policy makers and facilitate rapid responses when remittances experience volatility.

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