

Assessment of the impact of migrant remittances on the living conditions of the population in Morocco: micro econometric analysis

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Abstract

Making reference to the 2006-2007 household living standards survey and the 2013-2014 household consumption and expenditure survey in Morocco, we analyse the factors explaining the propensity of Moroccan migrants to carry out transfers and the money amounts involved. Afterwards, we attempt to measure the impact of these remittances on the households' welfare and their investments in human capital, such as children's schooling and accessibility to health care services. As the first survey aforementioned includes a specific section on the characteristics of migrant workers, members of the surveyed households, the determinants could be identified for each of the questions raised. But for the third question, we had to use a matching of households receiving transfers to form a control group. The results show that the demographic and socioeconomic characteristics of the migrants are not sufficient to explain the transfers. Those of households contribute significantly to the understanding of behaviors and are also decisive in assessing the impact.

keywords: Remittances, Moroccan migrants, Standard of living, Heckman, Matching.

1. Introduction

Remittances have an important role in the economic and social development of many developing countries. They contribute to increase household income in the countries of origin and consequently to improve living standards. In Morocco, the volumes transferred have increased significantly over time, except during the last international crisis (Table 1): from 4.1 billion dirhams in 1980, they rose to 19.3 billion in 1998 and to 62.2 billion in 2016. They represent currently the second largest source of foreign currency for the country after tourism and their volume is one quarter of bank deposits.

Table 1: Recent evolution and economic weight of MRA's transfers

	1998	2004	2005	2006	2009	2010	2011	2015	2016
MRA's transfers (in millions of dirhams)	19311	37422	40738	47834	50210	54387	58630	61750	62200
MRA's transfers/GDP	5,0	7,4	7,7	8,3	6,9	7,12	7,3	7,0	7,0

Source: Authors' calculations based on data from the Exchange Office and the High Commission for Planning

These transfers can be intended to meet fundamental needs of the population, but also for education and health expenditure: in other words, for human capital investment. A large part is allocated to real estate investment.

Several studies have highlighted the positive impact of remittances on poverty reduction. Thus, on a panel of countries, Adams and Page (2005) confirm that migrant remittances contribute to decrease both poverty levels and the gaps between social groups. They point out that a 10% increase in migrants' transfers leads to a 3.5% reduction in the poor population. Other studies (Mghari, 2011) show that in Morocco, the poverty rate in 2007 would have been 10.1% instead of 8.9% in the absence of transfers from Moroccans Resident Abroad (MRA).

For migrants, the decision to transfer funds is linked to their demographic and socioeconomic characteristics and particularly to their qualifications. Adams (2008) has shown that highly skilled migrants transfer less than the low-skilled ones. The first category proves to be better integrated in host countries and are more likely to receive family members there. Furthermore, they are less likely to consider the prospect of returning to their country of origin¹, and they come from families who are less in need of remittances as a source of income. On the other hand, families of fewer skilled migrants have higher expectations of a return on investment: efforts to finance the emigration of one of their members require compensatory transfers. Moreover, their migrants are more likely to consider returning to their country of origin. From this perspective, the process involves three phases of an implicit contract: the first phase when the family finances the worker's emigration, which is considered as a debt that will be repaid -in the second phase- in the form of transfer refund. Finally, the migrant concerned comes back to his country and risks "sanctions" if he has not fulfilled expectations. Other motivations help to justify the transfers; we observe an

¹ Cf. Jelili and Jellal (2002) have similar results and analyzes on the effect of skill level and the prospect of return.

altruistic behavior of migrants towards their families who live in the country of origin.

After a brief presentation of literature review on the determinants of migrants' transfers and their socio-economic impact on the households of origin (2), we investigate the decision of Moroccan migrants to transfer funds and then the amounts at stake, first, according to the demographic and socioeconomic characteristics of migrants, particularly the duration of migration, and then to the households to which they belonged (3).

In Section 4, we examine the impact of remittances by addressing the following questions: What would be the effect of the background and the region of residence? What is the contribution of these transfers to overall household consumption? How large is the reduction in poverty, vulnerability and inequality in Morocco? Particular emphasis will be placed on the impact of transfers on the children's schooling and on the accessibility of health care. To answer these questions, we constituted a control group of households that do not receive transfers.

2. Literature review, data and methodology

i. Lessons learned from works on transfers

i.i The motivations of migrants' remittances

The theoretical framework of Lucas and Stark (1985) provided the basis for many empirical studies on remittances issues. Indeed, they were the first to formalize the motivations for remittances. They distinguish three types of motivations: "pure altruism", "pure self-interest" and "tempered altruism".

These advances have given rise to interesting applied research on the motivations behind migrants' transfers.

If the migrant is motivated by an "altruistic" motive, his well-being depends also on his family's well-being who stayed in his native country (Coulibaly, 2016). Diagne and Rakotonarivo (2010), Bouoiyour and Miftah (2015) confirm this hypothesis by showing that the probability and the amount of transfers increase at the same time as the income of the migrant increases. For some authors, as long as the duration of migration is extended, the migrant performs less transfers. This result is explained by the distension of family ties (Merkle and

Zimmermann, 1992; Blue, 2004; Coulibaly, 2016). On the other hand, other researchers working on samples from other countries, note that migrants maintain strong transnational ties for long periods (Goza and Ryabov, 2012).

In contrast to the "altruistic" motive, the "selfish" motive is characterized by a dependence on the migrant's well-being only. Ownership of assets and/or part of his family (wife, children, etc.) in his country of origin may encourage the migrant to transfer them money with the aim to reassure himself that they take responsibility for their property and/or their family (Cox et al., 2004). In addition, the intention to return to his country of origin may also induce the migrant to transfer funds in order to invest in real estate and financial assets, for example (Gundel and Peters, 2008).

But the decision to remit may be more complex and also based on more "balanced" aspects than those previously explained. It is an "implicit contract" in which the transfer takes place within a broad family framework. The transfers would be endogenous to the migration process. They are seen as a counterpart of expenditure met by the migrant's family to bring him up (Bouoiyour and Miftah, 2015). In this case, the transfers are part of an "implicit coinsurance agreement" or of an "implicit family loan agreement" (Germenji et al., 2001). We suppose that, initially, the migrant acts as the insured person and his family as the insurer because it finances his migration, and, later on, the migrant acts as the insurer.

We note that there is no consensus on the general theory of transfers. Various empirical studies provide relevant results, but the explanations remain partial and present inherent limits in the geographical, socio-cultural and temporal contexts.

i.ii The impact of migrant remittances:

The studies on the impact of transfers on poverty generally indicate a reduction in poverty regardless of the indicator or method used. In his study on Lower Kabylia (Algeria), Benallaoua (2009) assessed the impact of remittances on households' monetary well-being using two methods. First, based on household income, he used the Ordinary Least Squares method. Then, he created a binary indicator from these incomes indicating whether the household is poor or not and used a Probit model. He shows that receiving transfers reduces the probability of household falling into poverty by 7.2%.

In order to measure the impact of external remittances on poverty in the Comoros, Younoussa (2011) adopts another methodology which consists of calculating two categories of expenditure, namely, households' expenditure per capita including and excluding remittances. The results show that receiving transfers reduces the incidence of poverty by 3.5%, depth by 7.4% and severity by 5.8%.

In addition to poverty decline (Adams and Page, 2005), remittances also affect positively education, health and the accumulation of human and physical capital (Edwards and Ureta, 2003; Woodruff and Zenteno, 2001).

ii. Data and methodology

The study of the determinants and the impact of transfers from Moroccans residing abroad is based on data from socioeconomic household surveys in Morocco.

The main source for addressing the issue of the determinants of remittances and their amount is the National Survey of Household Living Standards (ENNVN) conducted in 2006-2007 by the High Commission for Planning of Morocco. This is the most recent survey available in Morocco which includes information on the characteristics of migrants from the households surveyed. The total gross sample consists of 7200 households (4320 from the urban areas and 2880 from the rural ones). Its construction is based on a stratified three-stage sampling plan. The sample we are working on is made up of 992 households, 653 of whom receive MRA's transfers. These are households that have at least one family member living abroad.

For the analysis of the impact of MRA's transfers, we are using more recent data: the National Household Consumption and Expenditure Survey (ENCDM) conducted in 2013-2014 by the High Commission for Planning with 15970 households. The survey is stratified in two stages. The sample on which we are working here is made up of 1707 households that have benefited from migrant transfers. This survey is representative on a regional scale².

From a methodological point of view, we resort first to Heckman's procedure (1979) to study the determinants of remittances from Moroccan migrants and

² We hypothesize that the reasons for the transfers did not vary significantly between 2006 and 2013 and thus specify that the use of two bases spread over time is not prejudicial. It also has the merit of giving a more recent view of the benefits currently derived by households from transfers.

the amounts involved. We then use the matching method to assess the impact of these remittances on the population's living conditions³.

3. Econometric modeling of Moroccan remittances

The volume of remittances operated by Moroccans residing abroad experienced a strong growth during the period 1980-2012. It grew more than thirteen-fold, rising from 4.4 billion dirhams to 58.7 billion, i.e. an average annual growth rate of 8.4%, double the economic growth rate during this period. This growth can be explained by several factors:

First of all, it is inherent to the increase in the number of migrants and also to the structure: elevation of qualification's level (and, as a corollary, a better integration into the labour market of the host countries) and feminization of emigration too.

Secondly, at the macroeconomic level, in the context of the liberalization of the economy and in particular of the "post-structural adjustment" policies, the monetary and financial authorities have implemented incentive reforms. This is the case with the possibility given to migrants to hold "convertible currency accounts". Opening this type of account allows them to repatriate all or part of the sums held without having to seek authorisation from the Exchange Office. This strategy has more lasting effects than the successive devaluations of the 1980s (known at the time as the "slide of the Dirham"). It was later supplemented with the inclusion of migrants in the advantages granted to foreign investors who can repatriate all of their investments (including on the stock market) as well as the profits made.

Our study takes place at the micro-economic level; we first studied the decision to make transfers and then we considered the value of these remittances, using the method of Heckman (1979) presented in the appendix. The results of the estimates are shown in Table 2 below. The first column gives the results relating to the decision to transfer and the second, those linked to the volume of funds.

The results obtained are generally satisfactory. For the volumes, the "inverse Mills ratio" coefficient is largely significant (Student's T of -14.5). It is the same for the Chi-squared test which shows that the model is significant as a whole. Almost all of the variables have the expected signs and some of them are largely significant.

³ Details on the methodologies are given in the appendix (Boxes 1 and 2).

Table 2: Results of the two-step estimation

Variables	Selection equation (Probit): Probability of sending funds (1)	Regression equation (OLS): Value of transfers (2)
Migrant's characteristics		
Gender		
<i>Female</i>	<i>Reference</i>	
<i>Male</i>	-0.108 (0.117)	0.440*** (0.159)
Age	0.0524** (0.0252)	-0.0170 (0.0307)
Age²	-0,001 (0.001)	0,001 (0.001)
Kinship tie to the head of household		
<i>Spouse of head</i>	0.151 (0.254)	0.721*** (0.260)
<i>Other relationships</i>	<i>Reference</i>	
Marital Status		
<i>Single</i>	<i>Reference</i>	
<i>Married</i>	0.362*** (0.105)	-0.289** (0.140)
<i>Widowed ou divorced</i>	0.571** (0.265)	-0.140 (0.308)
School level		
<i>Without school level</i>	<i>Reference</i>	
<i>Primary</i>	0.102 (0.127)	-0.0264 (0.155)
<i>Secondary</i>	-0.0384 (0.161)	0.109 (0.198)
<i>Higher</i>	0.0766 (0.172)	-0.0414 (0.222)
Study location		
<i>Morocco</i>	<i>Reference</i>	
<i>Foreign countries</i>	-0.204 (0.200)	0.170 (0.268)
Socio-Professional Category		
<i>Senior managers</i>	0.855*** (0.238)	-0.0971 (0.300)
<i>Middle managers, employees, traders, skilled artisans</i>	0.886*** (0.135)	-0.424** (0.201)
<i>Agricultural and non-agricultural</i>	0.611***	-0.382**

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Variables	Selection equation (Probit): Probability of sending funds (1)	Regression equation (OLS): Value of transfers (2)
<i>operators, workers and labourers</i>	(0.128)	(0.194)
<i>Unemployed or inactive</i>	<i>Reference</i>	
Length of residence		
<i>Less than 5 years</i>	-0.00431 (0.185)	-0.235 (0.230)
<i>From 5 to 9 years</i>	0.238 (0.171)	0.409* (0.212)
<i>From 10 to 14 years</i>	0.217 (0.195)	0.527** (0.229)
<i>From 15 to 19 years</i>	0.186 (0.191)	0.0615 (0.234)
<i>20 years and over</i>	<i>Reference</i>	
Country of current residence		
<i>Spain</i>	<i>Reference</i>	
<i>France</i>	-0.131 (0.131)	0.0553 (0.169)
<i>Italy</i>	-0.221* (0.130)	0.229 (0.156)
<i>Germany-Belgium-Netherlands</i>	0.328** (0.139)	-0.316* (0.181)
<i>Arab countries</i>	0.347 (0.218)	-0.0985 (0.259)
<i>Other countries</i>	-0.583*** (0.211)	0.636** (0.289)
Financing the migrant's departure		
<i>Yes</i>	-0.0107 (0.0917)	0.276** (0.116)
<i>No</i>	<i>Reference</i>	
Characteristics of the household in the country of origin		
Gender of Head of Household (HH)		
<i>Female</i>	<i>Reference</i>	
<i>Male</i>	-0.290*** (0.108)	-0,156 (-0.131)
Proportion of children under 15 years old	-0.691*** (0.248)	0.643** (0.310)
Predicted expenditures per capita	3.626*** (1.328)	-2.629* (1.578)
Predicted expenditures per capita squared	-0.191*** (0.0677)	0.141* (0.0803)

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Variables	Selection equation (Probit): Probability of sending funds (1)	Regression equation (OLS): Value of transfers (2)
Géographic characteristics		
Area of residence		
<i>Urban</i>	-0.0499 (0.103)	0.109 (0.128)
<i>Rural</i>	<i>Reference</i>	
Region		
<i>Other regions</i>	<i>Reference</i>	
<i>Chaouia Ourdigha</i>	0.351** (0.137)	--
<i>Marrakech Tensift Al Haouz</i>	0.634*** (0.174)	--
<i>Rabat Salé Zemmour Zaer</i>	0.580* (0.333)	--
<i>Tadla Azilal</i>	0.334*** (0.127)	--
<i>Fès Boulemane</i>	0.708** (0.284)	--
Constant	-19.18*** (6.529)	21.99*** (7.802)
Inverse Mills ratio		-1.393666 (0.096)
Log Likelihood	3026	
Chi-squared (sig)	93,72 (pr=0,000)	
Number of observations	992	653

Source: Results obtained from data from the National Survey of Household Living Standards 2006/07 - High Commission for Planning.

Gender does not significantly influence the decision to make transfers. In contrast, men send a higher amount than women. The age of the migrant exerts a positive and significant influence on the decision to make transfers, but not on the volume of remittances. This result is due to the fact that, during the life cycle, the youngest migrants are generally in the study phase or job seekers, which reduces the chances of money transfers to their country of origin. Furthermore, age does not seem to have a non-linear effect.

The family relationship to the head of household does not affect the propensity to make transfers but influences their volume. Indeed, migrants who have their

spouses in Morocco transfer higher amounts than the others. This result can be explained, as suggested by Rapoport and Docquier (2006), by the selfish motive of migrants: having part of their family (wife, children, etc.) in their country of origin can incite them to send them money to ensure their well-being. This result is similar to that of Cox et al. (2004).

The level of education has no significant effect, neither on the decision nor on the volume.

The migrant's activity and profession turn out to be the main determinants of the decision to send remittances and their volume. Compared to the inactive and unemployed who serves as a reference, being "middle managers, employees, traders or skilled artisan" increases the probability of transferring more money compared to "senior managers" and even more so than "agricultural and non-agricultural operators, workers and labourers ". On the other hand, the coefficients of these modalities become negative for the volume transferred.

Employed migrants have an income and are therefore more likely to support financially their families back home. Since we do not have at our disposal a dataset about their income levels, their employment status can serve as a proxy. Thus, the value of the coefficients affecting the workers' modalities explains the differences in the propensity to transfer and confirms the existence of altruistic behaviour among migrants. This result is similar to that noted by Diagne and Rakotonarivo (2010).

The opposite signs in the transfer amounts equation can be explained by the fact that when the "unemployed and inactive" people transfer, they grant large amounts. Descriptive statistics show that in this category, the percentage of those who transfer is low compared to the others⁴. Thus the low proportion of those who transfer (wealthy rentiers) have the financial means to transfer higher amounts.

The length of stay of migrants in host countries has a significant effect on the amounts of remittances: migrants who have resided in host countries for a long time (20 years and more), transfer higher amounts than those who have resided there for less than 14 years. Moroccan migrants keep an emotional attachment to their country of origin and preserve the links that the authorities' strategy seeks to maintain (a Ministry is dedicated to migrants and various measures also encourage them to invest, particularly in housing).

On the one hand, this result joins that of Goza and Ryabov (2012) who explain that migrants keep strong transnational links during long periods of migration;

⁴ 41.4%, less than 79.5% among middle managers or 78.8% among senior managers. On the other hand, in the MRA's population making transfers, the "unemployed and inactive" represent only 17.3% (27.3% in the total sample).

and, on the other hand, it confirms the observation made above on the diversity of behaviour inherent in the importance of sociological contexts.

The decision to transfer remittances and their value differ according to the migrants' current country of residence. Compared to Spain, where resides a large Moroccan community, the probability of making remittances is higher among those living in Germany, Belgium and the Netherlands. This probability is lower among those living in Italy and "other countries". In fact, the waves of migration to Spain are more recent⁵. The proportion of migrants who are unemployed or in the process of settling there is higher and therefore they do not have the means to carry out transfers. On the other hand, those who are able to transfer remittances make greater efforts to send higher amounts, due to the fact that their migration is more recent.

This is why we notice that the influence of the country of residence is significantly correlated with the amounts of transfers only for "Germany, Belgium and the Netherlands" and "other countries". Indeed, although they are more inclined to make remittances comparatively to migrants in Spain, those settled in these three countries send lower amounts. Their period of migration is much longer; so, although they maintain their ties, they make less efforts in terms of amounts.

Having received financial assistance before departure to the host country has no effect on the decision to make transfers, but it affects significantly and positively the amounts transferred. The population of those who have received financial aid is heterogeneous: it includes migrants from wealthy backgrounds who do not need further help afterwards, and those from modest backgrounds who need to make transfers. Therefore, Moroccan migrants transfer funds irrespective of the aid they received when leaving their country of origin. They send funds to their home households to repay the "debts contracted" at the time of departure, but also out of altruism and solidarity with their families.

Among other characteristics of the original household, the gender of the head of the household has a significant effect: the migrant's propensity to transfer funds is higher if their household of origin is headed by a woman. These women usually take over the household after their spouses have left, and they exert greater pressure because foreign remittances represent their main means of subsistence.

In order to assess the effect of the financial situation of households, we chose expenditure per capita as an income proxy. To avoid the problem of endogeneity that could exist between the amounts of transfers and expenditure per capita, we used an instrumental variable: "expenditure per capita" before remittances. We obtained the predicted values of this expenditure by regressing the logarithm of consumption expenditures per capita on several variables such as: the average

⁵ 6.2 years on average for Spain, 15.4 for the Netherlands and 10.1 in Belgium.

education level of household members, the area of residence, the proportion of employed active members, possession productive assets, etc.

The standard of living of the households of origin has a significant effect on their propensity to make transfers and, to a lesser extent, on their amounts. Expenditure per capita has a non-linear effect (inverted U-shaped) on the receipt of remittances. The probability increases with the standard of living (and the human capital endowment of the migrant) until a certain threshold and then decreases (because households become independent of remittances).

In terms of amounts, the relationship is U-shaped. Vulnerable households exert more pressure and receive higher amounts, which decrease alongside with the increase in per capita expenditure until a certain threshold is reached, and then they increase. Migrants from well-to-do households can be considered well-endowed in human capital and consequently engaged in well-paying activities. Thus, those among them who decide to make transfers, do so in order to make investments. They often live between their host country and the country of origin, where they develop business. Hence the amounts they transfer are higher.

4. Impact of MRA's transfers on household living standards

i. Impact of transfers on household living standards, poverty and vulnerability

A good understanding of the impact of transfers requires a comparison of the standard of living and the state of poverty of two samples of the population: the first is made up of households that receive transfers and the second of those that do not. This option overcomes the methodological problem inherent in the fact that it is not possible to observe the expenditure levels and the poverty status in which the receiving households would have been if they had not benefited at all from the transfers. The "counterfactual" analysis thus permitted is common in impact-assessment methods.

In keeping with this approach, we proceeded to a matching to obtain the comparison group, by identifying non-beneficiary households whose certain characteristics are similar to those of the beneficiaries. Among the observable variables, we selected for the estimation of the propensity scores those which influence the chances of being a transfer recipient: the area of residence, the region, the type of habitat, the household size, the age of the head of household, his marital status and his education level (For a presentation of the matching method used, see Box 2 in the appendix).

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The comparisons show that transfers have a significant impact on consumption expenditure per capita, poverty and vulnerability status (Table 3). We note that the remittances have improved the standard of living of each recipient household by 4026 MAD (or around 378 €) per year (the gain was 2190 MAD or 206 € in 2006). The poverty and vulnerability rates of recipient households are 2.2 and 8.7 percentage points lower, respectively.

Table 3: Impact of transfers on total consumption expenditure, poverty and vulnerability by area of residence

Area of residence	Average effect of MRA's transfers		
	Total annual expenditure per capita	Poverty rate	Vulnerability rate
Urban	4942 MAD	-1,2 %	-5,1 %
Rural	3492 MAD	-5,9 %	-21,1 %
National	4026 MAD	-2,2 %	-8,7 %

Source: Results obtained from data from the National Household Consumption and Expenditure Survey 2013/14 - High Commission for Planning.

The distribution by area of residence shows that the gains inherent in transfers, in terms of standard of living, are greater among households living in rural areas.

MRA's transfers have also contributed to the reduction of income⁶ inequality (Table 4). Therefore, the Gini index shows that they contributed to the reduction of inequalities by 0.5% at the national level, going from an overall value of 0.397 to 0.395. The drop is 0.8% in urban areas and 0.3% in rural areas. It is interesting to note that in terms of level, the earnings of rural households are more substantial; but in terms of inequality it is in the urban area that they are more limited. Similarly, compared to the situation in 2006, the gains in levels were lower (in current Dirhams) but the Gini index showed a more significant drop (0.413 to 0.407, or 1.4%).

⁶ Income is approached here by total consumption expenditure. This is why the terms “expenditure” and “income” are used interchangeably.

Table 4: Impact of transfers on inequalities by area of residence

Area of residence	Gini Index		Effet of transfers on the reduction of inequalities in %
	Without transfers	With transfers	
Urban	0,391	0,388	0,8
Rural	0,318	0,317	0,3
National	0,397	0,395	0,5

Source: Results obtained from data from the National Household Consumption and Expenditure Survey 2013/14 - High Commission for Planning.

At the regional level, the effect on the level of expenditure per capita is higher in the regions of "Rabat-Salé-Kénitra", "Southern regions" and "Casablanca-Settat" (Table 5). However, the impact in terms of poverty reduction in these regions is lower (between 0 and 2.2 percentage points). This is due to the lower poverty rate in these regions (between 2 and 3.8%, HCP).

Table 5: Impact of transfers on expenditures per capita, poverty and vulnerability by region of residence

Region of residence	Average effect of MRA's transfers		
	Expenditures per capita	Poverty rate	Vulnerability rate
Tanger_Tétouane_Al Hoceima	3865	-3,2	-4,0
Oriental	1233	-4,2	-13,7
Fès-Meknès	4211	-4,8	-10,2
Rabat-Salé-Kénitra	9908	-2,2	-6,1
Beni Mellal-Khénifra	2406	-1,6	-14,7
Casablanca-Settat	5121	-0,4	-5,7
Marrakech-Safi	1189	0	-11,3
Daraa-Tafilalet	0	-1,7	-10,1
Sous-Massa	3299	-2,2	-10,7
Southern Regions	7123	0	-9,2

Source: Results obtained from data from the National Household Consumption and Expenditure Survey 2013/14 - High Commission for Planning.

On the other hand, it is in the poorest regions (who are the main feature of poverty rate of 5.3% according to HCP statistics) where transfers have alleviated

poverty. These are "Fès-Meknès" and the "Oriental" regions, where poverty rates fell by 4.8 and 4.2 percentage points respectively.

A trend seems to be emerging: the effect on expenditures per capita is smaller in the poorest regions, but the effect on poverty and inequality is higher. This is the case for the "Daraa-Tafilalet" region, where the average level of expenditure does not change due to transfers but where the reduction in the poverty rate amounts to 1.7 percentage points. This region is the poorest in Morocco, its poverty rate being 14.6% in 2014 (HCP).

In addition to the overall effect on living standards, the available data also allow us to apprehend the impact on poverty dynamics, in particular the improvement of children's schooling and accessibility to health care services.

ii. ii. Impact of transfers on children's schooling and on access to health care

Typically, low-income households face financial constraints and are unable to pay for their children's schooling or to look after the health of their members. Do migrant remittances enable these households to meet these needs?

The impact of MRA's remittances on education is apprehended here by the school enrolment rate of children in age range of 6 to 14 years. As for that on access to care, it is captured by the rate of medical consultations of everyone (at any age) who declared being sick or having an injury during the last two months preceding the survey.

The results in Table 6 reveal that belonging to a household receiving transfers increases the net school enrolment rate of children by 2.2 points (93.9% whose households do not receive transfers and 96.1% among those who receive transfers). The gains are more marked in rural areas (+ 5.2%).

Table 6: Impact of transfers on children's schooling and on accessibility to health care services by area of residence

Milieu	Average effect of MRA's transfers	
	School enrolment rate of children 6-14 years old (%)	Rate of medical consultation (%)
Urban area		
With transfers	98,2	88,9
Without transfers	96,5	88,0
Average effect	1,7	0,9
Rural area		
With transfers	91,5	79,9
Without transfers	86,3	78,9
Average effect	5,2	1,0
At the National level		
With transfers	96,1	86,5
Without transfers	93,9	86,3
Average effect	2,2	0,2

Source: Results obtained from data from the National Household Consumption and Expenditure Survey 2013/14 - High Commission for Planning.

Regarding the access to health care, MRA's remittances contribute to a slight improvement in the rate of medical consultation in the event of illness or injury (86.5% versus 86.3%). It is in rural areas that the gain is more noticeable (+1 percentage point).

It should be noted that compared to 2006, the percentage gains appear less clear-cut, but on the one hand they relate to a higher volume of population and, on the other hand, the infrastructures have been improved.

5. Conclusion

The MRA's community has experienced a strong expansion over the last fifty years, to the point of representing some 10% of the legal population counted in September 2014. At the same time, the transfers they make are steadily increasing, to the point of representing an average of 7% of GDP during the

period 2008-2012. On the other hand, 13.5% of Moroccans receive these transfers.

Empirical analysis of the determinants of remittances has made it possible to assess the probability of receiving them by Moroccan households, and on the other hand to identify the factors influencing the variability between the amounts they receive.

The decision to make transfers and the amounts involved depend on several factors: the individual characteristics of the migrants (gender, marital status, socio-professional category, educational level, etc.), the place of residence before migration, the duration of residence in the host countries and its characteristics. Other variables linked to the characteristics of the original households (standards of living, characteristics of the household head and other members) help to explain both the propensity to receive remittances and their amounts. In the case of Morocco, altruism and family solidarity remain the main determinants.

Migrant remittances represent an important financial windfall for many developing countries and can help stimulate growth, improve living standards and thus reduce poverty in these countries. Morocco is no exception to this reality.

To assess the impact of remittances on the living conditions of recipient households, we conducted a counterfactual analysis that involved matching households from two databases. Remittances contribute significantly to improve the well-being of the households concerned. Thus the expenditure per capita of the latter is 22.5% higher than that of non-recipient households. As a result, their poverty and vulnerability rates are respectively 2.2 and 8.7 percentage points lower (the gains were 4.6 and 9.4 points in 2006). The remittances have also contributed to the reduction of inequalities by around 0.5%.

Transfers marginally favour the children's schooling between the age of 6 and 14 (the net enrolment rate reaches 96.1% against 93.9% in the absence of remittances). At this level, the improvement is more marked in rural areas (5.2 percentage points against 1.7 in urban areas).

Finally, as regards accessibility to health care (with medical consultation rates as an indicator), the improvement is significantly more marked in rural areas (1 percentage point) compared to urban areas (0.9).

Although migrant remittances are beneficial for a sizable number of Moroccan households, the question of their sustainability remains unanswered. The links with the economic situation and political trends in the host countries also deserve in-depth analysis.

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Appendix 1: Presentation of the two-stage estimation used, the Heckman method (1979)

The first step is to estimate the model for the decision to transfer. It is a Probit with variables relating to the characteristics of the migrant and those of the household to which he belonged before his departure⁷. The variable to be explained (decision to send funds), is a dichotomous qualitative variable taking 2 modalities:

$$\text{Sending remittances} : \begin{cases} 1 & \text{if the migrant transfers funds} \\ 0 & \text{otherwise} \end{cases}$$

We consider a variable y_i which takes two ordered modalities 0 and 1. The latent variable y_i^* which is not directly observable is the sum of a deterministic component (including the explanatory variables used) and a random element:

$$y_i^* = \beta' x_i + \varepsilon_i \quad (1)$$

Where x_i represents the vector of the exogenous variables, β is that of the parameters, and ε_i the residual error.

The second step is to estimate the amount of funds transferred⁸. The equation is written:

$$Y_i = \beta' z_i + v_i \quad (2)$$

With Y_i corresponds to the vector of the Log of the value of the transfers made by the i^{th} migrant, Z_i is the matrix of the explanatory variables, β is the vector of the estimated parameters and v_i the error term.

The estimation by Ordinary Least Squares (OLS) method would not be appropriate due to the existence of a selection bias inherent to the non-inclusion of migrants who do not remit. This bias is corrected by introducing the inverse

⁷ The characteristics of migrants retained are: gender and age, relationship with the head of household remaining in the country of origin, marital status, level of education, study location, socio-professional category, length of residence abroad, country of current residence and the existing of financing the migrant's departure. For the characteristics of the households, we retained: the gender of the head of the household, proportion of children under 15 years old, area of residence, the region of residence and predicted expenditures per capita (before transfers): instrumented variable whose value is obtained by regressing the logarithm of consumption expenditure per capita on several variables such as the proportion of literate people in the household, the place of residence, the proportion of employed members, the possession of productive assets, etc.

⁸ The estimate relates only to migrants who have made transfers in cash or in kind to their original household.

Mills ratio, obtained from the estimation of the selection equation in the first step⁹.

Finally, the equation to be estimated for the amounts transferred is as follows:

$$R_i = \beta' z_i + \eta' \lambda_i + v_i \quad (3)$$

Where λ_i is the inverse Mills ratio and η' the corresponding parameter.

⁹ The inverse Mills ration is the ratio of the probability density function to the the cumulative distribution function.

Appendix 2: Presentation of the matching method used

The propensity score matching method (Rosenbaum and Rubin, 1983) consists of associating each household that received transfers from an MRA with a household that did not receive transfers but that has similar demographic and socio-economic characteristics. This second sample serves as a comparison group.

Matching is based on the estimation of propensity scores, using a Probit model (default). The variable to be explained is binary: $D_i = 1$ if the household receives transfers and $D_i = 0$ otherwise (control group household). Given that Y_i represents the variables of interest¹⁰, the measurement of the average effect of receiving transfers on the treatment group (recipient households) is as follows:

$$\Delta_{ATT} = E(Y_{i1} | D_i = 1) - E(Y_{i0} | D_i = 0) \quad (4)$$

To understand this effect using the matching method, two hypotheses must be respected : The Conditional Independence Assumption (CIA) and Common Support (Caliendo and Kopeinig, 2008).

The first hypothesis implies that the selection is based only on the observed characteristics X . While the second ensures that for each treated household, there is a control household identified using the same observed variables, for which it shows strong similarities or proximity, as measured by propensity scores (but these variables are not introduced for the impact measure).

Thus, the propensity score is estimated on variables that influence the chance of receiving transfers. In our case, we have chosen the following variables: the place of residence, the region of residence, the type of habitat, the size of the household, the age of the head of the household, his marital status and his level of education.

¹⁰ Variables relating to the socio-demographic and economic characteristics of heads of households and their geographic location.