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Macroeconomic Determinants of Migrants' Remittances in the Southern and Eastern Mediterranean Countries

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Introduction

International migration flows are a very sensitive subject in the public opinion. Simultaneously, migration plays a very decisive role in the insertion process of the less developed countries in globalisation. In fact, international migration flows, economic globalisation and regionalisation process are, at least in the short or middle run, complements rather than substitutes (Alba, Garson and Mouhoud, 1998). Migrant workers remittances constitute the second biggest source of foreign transfers to the developing world with Foreign Direct Investment (FDI) and are more important than the public aid, official development aid and private capital transfers. Thus, international organisations (IMF, World Bank, etc.) or home and host country governments consider remittance flows as an engine of development. Some policy makers and academicians give a very important role, maybe more than their actual impact on development, to international migration and remittances. In some cases they are also used in macroeconomic financing by major receiving countries. For example, in Turkish case, in the second half of 1960s, the migrants' transfers played an important role for the sustainability of the external deficit. In 1969, remittances were about 18% of the imports.

However, the economic impacts and determinants of remittances on the receiving countries are not enough documented in the existing literature. Recent economic research brings very ambiguous responses to this phenomenon. The economic impacts of remittances depend largely on their use in the home countries (investment, consumption, health, education etc.) The motivations of remittances can be clearly distinguished using macroeconomic data analysis for those related to consumption or investment. However, to have a better understanding of the subject and to confirm the results of the estimations of the macroeconomic determinants; analysis should be complemented with individual survey data. Exactly, what are the determinants of migrant remittances at the macroeconomic and microeconomis level? How do remittances sent by migrants are used in the home countries?

In the first section, the paper analyses the remittance flows from Europe to the southern and eastern Mediterranean countries. In a second section, the existing literature on the determinants of remittances (with a special emphasis on the macroeconomic determinants) both at theoretical and empirical level is investigated. This section also presents an

econometric analysis of the macroeconomic determinants of remittances for the main South and East Mediterranean Countries (Turkey, Egypt, Morocco, Tunisia and Algeria).
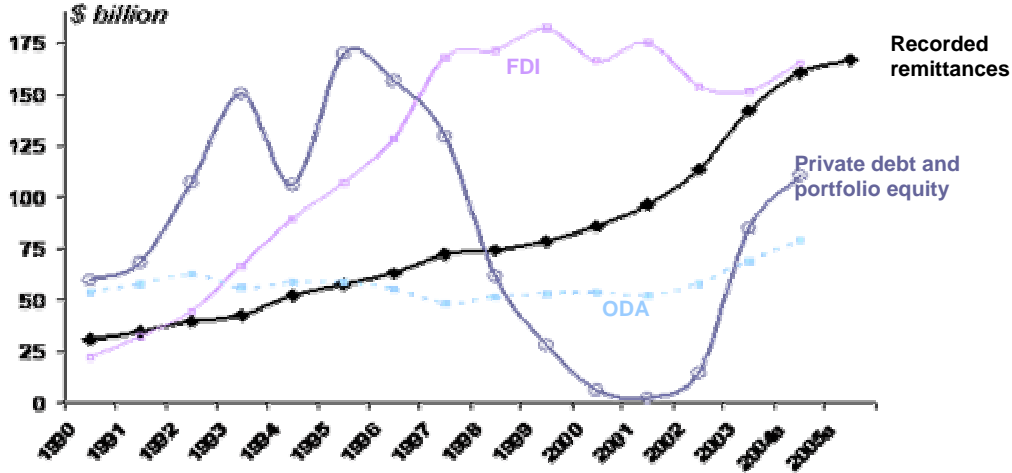
1. The remittances in the Mediterranean Basin

1.1. Global trends in remittances

There has been an important increase in the migrant remittances in the last decade. Because of their growing volume and their stable nature, they have become an important topic of interest for most economists. According to World Bank estimates (2006), developing countries received USD 167 billion in official remittances in 2005, up to 95 percent from 2000, and up to 189 percent from 1995.

Migrants' remittances are started to be considered as development tools for main labour exporting countries. Officially recorded remittances have become one of the highest sources of external funding for developing countries following the Foreign Direct Investments (FDI). More recently, remittances have attempted the same level as FDI (see graph 1). One of the most important properties of migrants' remittances as an external funding is their private nature. They are not used in a way chosen by governments and they do not entail any interest to be paid and they are not repaid. The majority of remittances are sent by individuals directly to their families in their home country.

Graphic 1: Workers' remittances and other inflows to the developing countries (1990-2005)

Source: World Bank GEP 2006

In the case of the major South and East Mediterranean Countries, compared to other developing countries (Graphic 1), remittances constitute the most important source of foreign exchange (see Graphic 2). Although there is a convergence between the remittances and the FDI for the developing countries, FDI represents a bigger part of the inflows for the developing world. For the five Mediterranean countries, even if there is a decrease in the remittances after 1999, mainly due to Turkey and Egypt, the migrants' transfers are more important than the FDI and the ODA.
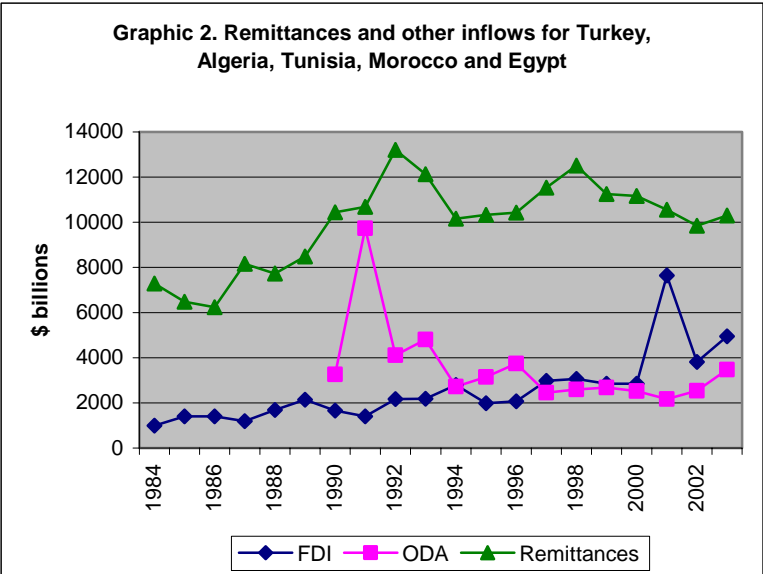
Source: IMF for FDI and Remittances, OECD for Official Development Assistance

It should also be mentioned that there exist considerable disparities between the parts of the receiving countries in the total remittance flows. For example, only the five countries (Mexico, Philippines, India, China, and Morocco) received more than 50% of all remittances in 2003 (see Graph 3 and Graph 4). As we analyse the regions, the results do not change at all. As it is well known, in absolute terms, the poorest regions receive less remittance than the middle income regions. This difference between developing countries is related to the fact that the poorest countries have a very low expatriation rate, and thus receive fewer remittances. The middle revenue countries have the highest expatriation rates and as for the richest third world countries the expatriation rate is again very low. We get a sort of inversed U curve between expatriation rate and countries' income level[1].

Remittances in the SEMC have been increasing for the three last decades but are also very fluctuating during the same period (see graphics 5 and 6).

In Algeria, the structural weakness of remittances can be explained by the importance of informal transfers. In the last few years the situation has started to change as a result of a convergence between the official and the unofficial exchange rates and the regulations that give the possibility of holding foreign currency bank accounts.
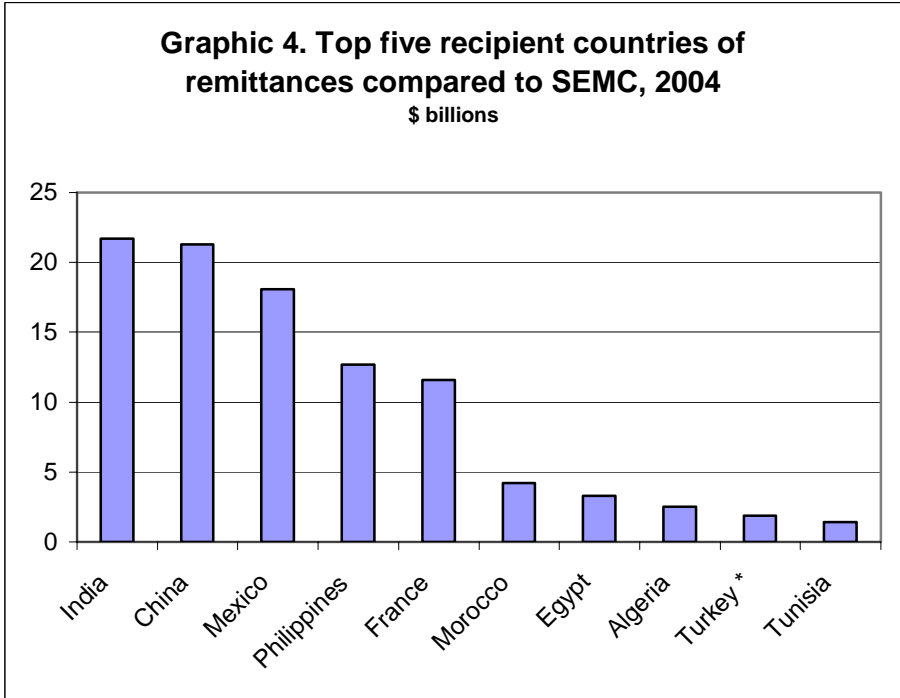
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[1] See Cogneau et Gubert [2005], p. 64.

Graphic 3. Workers' remittances and other inflows by developing region, 2002, (Billions dollars)
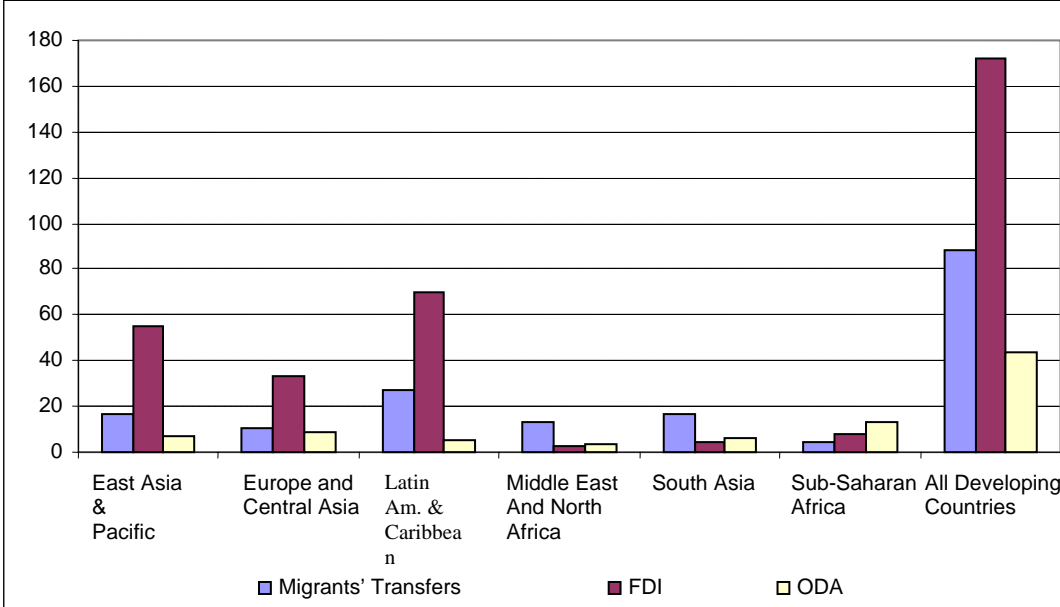
Source : Cogneau et Gubert, 2005

Source: World Bank, * data 2002 for Turkey

In Morocco and Tunisia, the remittances continue to increase and remain quite stable in time. In Tunisia, remittances are around 4 % of GDP. For Moroccan expatriates, in recent years, it has become easier, cheaper, and more attractive to remit money to their country because of government-encouraged expansion of Moroccan bank branches in Europe, the suppression of restrictions on foreign exchange, fiscal measures favouring migrants, and devaluations that increase the value of foreign currency. Since 2000, there has been a spectacular increase in official remittances, which reached $4.2 billion in 2004. New labour migration flows to Spain and Italy and those countries' large-scale legalization programs in recent years also generated this increase. Morocco has been relatively successful in channelling remittances from unofficial channels to the official ones. Remittances are a crucial and relatively stable source of foreign exchange for the country. In 2004, official remittances represented 8.4 percent of the Morocco's GDP, and also exceeded the value of direct foreign investments (which are indeed much more unstable).The actual amount of remittances is estimated to be at least one-quarter to one-third higher because money transfer is also made through informal channels or in the form of goods taken to Morocco.

In contrast to the global trend in other southern and eastern Mediterranean countries, in Egypt, remittances have increased until 1992-1993 (Golf War) and since then felt dramatically. Egypt is the only country to present such fluctuations in the remittance flows.

As in the other countries of the region, worker remittance flows to Turkey has also an increasing trend until 1998. However, since 1998, the remittance flows to Turkey have decreased dramatically. First the 1999 recession, and then two economic crises in 2000 and 2001 can be responsible for this sharp decrease. It is possible that, in such an economic context, accompanied with an important decrease in the confidence of economic agents to the economy, migrants prefer to remit using unofficial channels rather than the official ones or simply not to remit at least for investment motives. It is then important to measure also the unofficial remittances to better understand the decrease in the remittances after 1998 towards Turkey. On the other hand, the decrease after 2003 largely reflects the change in the classification of workers' remittances by the Central Bank of Turkey. Before 2003, in Central Bank of Turkey's calculations, workers' remittances included foreign exchange remittances converted into Turkish Lira, Turkish lira conversion from their foreign exchange accounts and

money spent during their visit in Turkey. Following the introduction of the new method the last two items were reclassified as tourism revenues. (FEMIP 2006)

Graphic 5 and 6. Workers' remittances in USD and %GDP
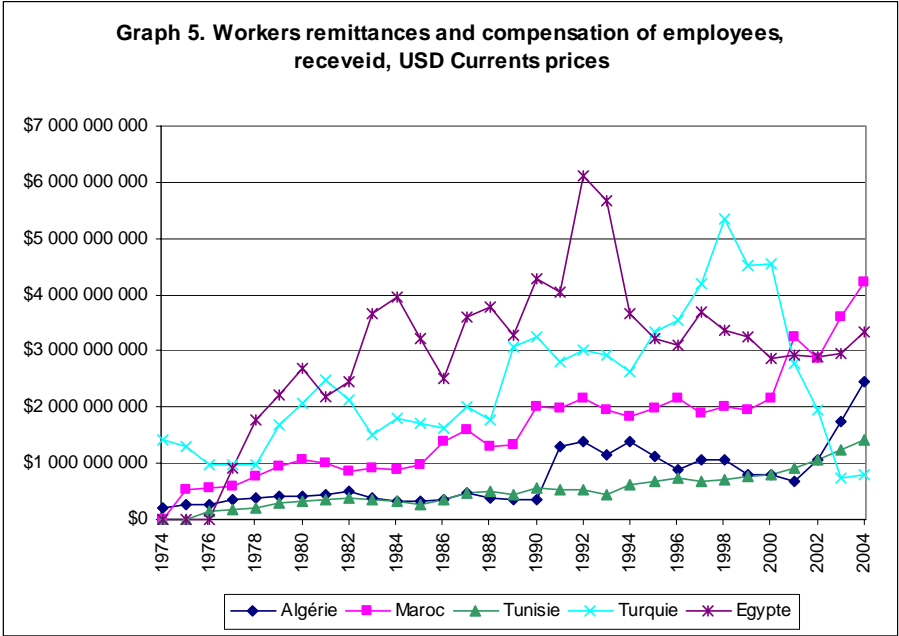
Source: World Bank
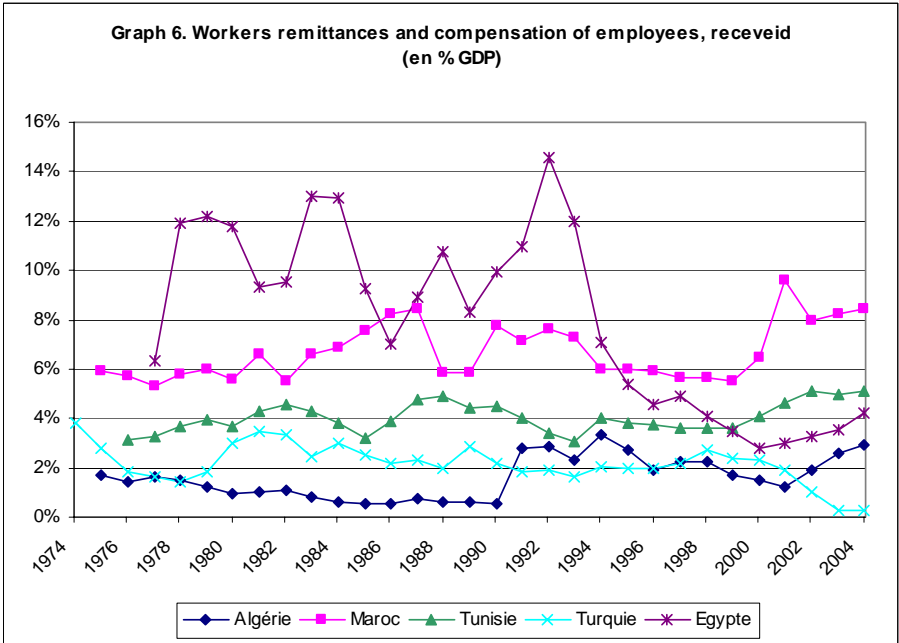
Source: World Bank

1.2. Major Remittance sending countries for SEMCs

Major migrant receiving countries are at the same time major remittance sending countries. Emigration, whether permanent or temporary, generates substantial remittances made by migrants to their country of origin. Because most of these financial flows are sent to migrants' families, they reach the same regions that migrants come from.

To study the source countries for remittances, we have to take into account the distribution of migrant population. Not only the migration flows, but also the migration stock as well as the naturalized migrants should be taken into consideration.

In this section, we analyze the main Mediterranean migrant receiving countries. In this analysis, foreigners and persons born abroad are taken into consideration in order to capture better the part of each migrant receiving country in the remittances flows.

The major part of the remittances comes from main European countries except for Egypt (Annex 1), where migration is mostly dominated by the temporary migration in the Arabic Peninsula (60%) and Libya. Permanent migration goes mainly to the OECD countries. United States is the major receiving country for this type of migration.

For the North African countries, because of linguistic and historical ties, France is the main receiving country. The part of France in the migrant distribution of Tunisia and Algeria is respectively 74% and 86%. However, its part as receiving country for Moroccan migrants is less important (about 44%). The Northern Mediterranean countries, especially Spain and Italy, become more and more important destination countries for Moroccan migrants (Mouhoud, Oudinet, 2006).

Germany is the main receiving country for the Turkish migrants. This is the result of bilateral agreements between two governments in the early 1960s. Its part in the Turkish population living abroad is about 68%. However, compared to the migrants of other SEMCs, Turkish migrants seem to be most dispersed ones in the Western Europe (Mouhoud, Oudinet, 2007).

The outflow remittances from main host countries (Graphic 7) are relatively stable compared to the inflow of remittances of the SEMCs (Graphic 5). However the remittance outflows from two new host countries of the Moroccan and Tunisian migrants, Italy and

Spain, start to increase in the last few years. On the other hand, remittance outflows growth from Germany after 2001 is contradictory with the sharp decrease in remittance flows to Turkey. This also confirms that the sharp decrease in the remittance flows to Turkey is mainly due to the change in the classification of workers' remittances by the Central Bank of Turkey.

Graphic 7. Remittance outflows from principal host countries
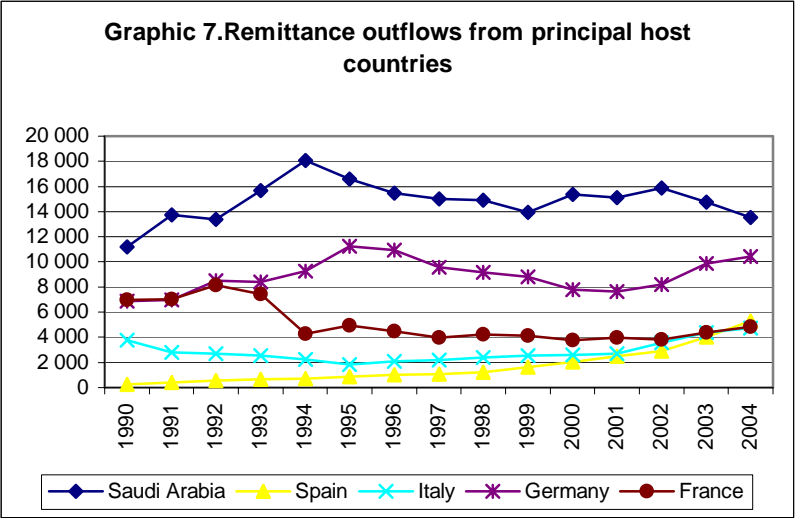
Source: Global Economic Prospects 2006: Economic Implications of Remittances and Migration, World Bank

2. Determinants of migrant remittances

Remittances have micro and macroeconomic determinants. The main microeconomic determinants are the ones such as the characteristics of migrants, their situation relative to the home country and relative to their families, income of their family, and education level of the migrants. Macroeconomic determinants are composed of determinants such as wages in the host countries, inflation, exchange rates, economic conditions in both home and destination countries. The macroeconomic effects of migrants' remittances became an important issue of analysis as a development tool. On the other hand, the researchers started to analyse more and more the macroeconomic determinants of migrants' remittances to see if countries of origin can use macroeconomic tools to attract more remittances.

2.1. Why do migrants remit?

The migrants' remittances first depend on the level of migrants' savings in their host country. Migrants can decide to remit or to use their savings in the host country. Empirically, many factors determine this willingness to remit like the migrant's family situation, the qualification level of the migrant or the duration of stay (OECD 2006). In the microeconomic theoretical literature, migrants are supposed to remit for individual reasons or within family arrangements.

a) Individual altruistic motives
Individual motives are mainly pure or impure altruism (enlightened selfishness) and exchange motives between the migrants and his recipient family in the country of origin.
In the case of pure altruistic motives, the utility of the migrant depends only on the amount of remittances he sends. In the case of impure altruistic motives, migrants send money back home in order to contribute to the income of their families left behind. Then the utility of the migrant depends also on the income of his family in the country of origin. The amount of remittances should increase with the migrant's income, and decrease with the amount of the domestic income of the family. The duration of stay should have a negative impact on the remittances because it is supposed that the attachment to the family weakens gradually. Family unification has also the same effect as there are less people left behind to look after.

b) Family arrangements

In the case of family arrangements, we can distinguish three types of motivations: Exchange, insurance and investment motives. These motives can also be called as "tempered altruism" or "enlightened self-interest" (Lucas and Stark 1985)

i) Exchange motives :

The migrant transfers to the hole family in exchange of services offered for the welfare (health, education etc…) of the left behind (wife, children). Migrants are supposed to remit even if the family revenue increases because the quality of services their remittances can buy increases. They can expect a better consumption, education, health for their children under the protection of the large family recipient.

ii) Insurance

Insurance motive is based on Intra-familial arrangements against income volatility. It is a contractual arrangement between the migrant and his family. In the rural areas of most developing counties, where financial and assurance markets are incomplete, the revenues are subject to risks such as drought, price fluctuations etc. To diversify the risk of rural income volatility, families can decide to allocate some members to urban or foreign migration. Although urban and foreign jobs are also subject to risks, these risks are independent from the agricultural income variations. At the beginning of the contract, family pays the migration costs in exchange of future remittances. In the case of these types of family contracts, remittances can flow to the family in case of agricultural income drops and to the migrant in case of unemployment. (Rapoport and Docquier 2006)

These kinds of arrangements can also be seen within a village but family is the most frequent context of such arrangements. This can be explained by the mutual altruism between family members. However, as we are in a contractual agreement context, bargaining strength of two parties plays a role in the amount of remittances. A high income level in the family increases its bargaining power. In the presence of altruistic motives, it is expected that lower-income households receive more remittances. Within a bargaining model, the reverse can be expected because the bargaining strength of a lower-income household would be smaller. (Lucas and Stark 1985)

Such intra-family contracts are also subject to moral hazard problems. Within such contracts, remittance recipients' are insured against risks and they can reduce their level of

effort to ensure their minimum income. As there is no control mechanism between the migrant and the family, and in the presence of incomplete information, moral hazard problem may emerge.

iii) Investment

The third one is the investment motives: In this case, the migrant transfers with the objective to get a return on the family investment in the home country for him and for his children like inheritance or strategic behaviour. The migrants can decide to invest their savings in their home country as well as in their host country. If the main motivation to remit is to invest in the home country, we can say that investment motive dominates the remitting decision of migrants. In this case, the migrant calculates his potential return in his home country relative to his potential return in the host country. The macroeconomic stability in the home and host countries and the interest rate differentials determine the remitting decision of the migrant.

Consequently, the remitting decision is taken in the microeconomic level. At this stage of decision making, microeconomic factors like the family situation and the family income in the home country, the duration of stay, the income level in the host country determines the remittances. Once the remitting decision is taken, macroeconomic factors determine how much the migrants will remit for the insurance reasons, or how will the migrant use its savings for the investment reasons.

2.2. Review of literature on the econometric studies: macroeconomic determinants

Table.1 provides a comparison between the most commonly used explanatory variables in the literature to explain the macroeconomic determinants of migrant remittances in the light of six articles. In Table.1, we see that the most commonly used and the most important variable in the literature is the income level in the host country. In all articles, this variable has a significantly positive effect on the remittances. Straubhaar (1986) does not use directly the host country income as explanatory variable but he uses the wages available and the possibility to become active in the host country. These two variables, which are significant and positive in his study also shows the importance of the income level in the host country. He examines the determinants of flows of remittances from Germany towards

Turkey in the period 1963-1982. The author does not investigate directly the determinants of workers' remittances, but the question he asks is what determines the emigrants' propensity to invest his savings either in his home country or abroad. Putting the investment motive of remittances as hypotheses, he then questions what part of these savings will be remitted and what are the factors determining this decision. Although the paper covers the period before the financial liberalisation of Turkey, the results show that investment motive had always a place in the remittance decision of Turkish migrants. He finds that, first, the wage level and the possibility to become active determine the potential flow of remittances and then the political stability dummy determines what part of it has really been remitted. The confidence the Turkish emigrants felt in the safety and liquidity of their investments in Turkey has an important impact on their decision to remit.

Real overvaluation, or the exchange rate variable is non significant in the three of the papers which uses them as an explanatory variables. But on the other hand, black market premium variable has always a significant negative effect on the remittances. Here, we should note that all the papers use the "official" remittances as dependant variable. As the difference between the official and black market exchange rates increase, migrants would prefer to remit using unofficial ways. As long as we do not provide data on the volume of unofficial remittances, it is hard to test the effect of exchange rate changes on the remittances.

El-Sakka, Mcnabb (1999) estimate the macroeconomic determinants of worker remittances and the income elasticity of imports financed by remittances for Egypt. They find that remittance flows are highly responsive to the differential between the official and black market exchange rates. The differential between domestic and foreign interest rates has a negative and significant impact on the inflow of remittances through official channels and domestic inflation is found to have a positive and significant impact on the inflow of remittances. They also find that imports financed through remittance earnings have a very high income elasticity which suggests either that these imports are consumer durables and luxury goods or that they are undertaken by higher income groups. This is the only paper who finds a positive relationship between the domestic inflation and the remittances. This means that for the Egyptian case, the altruistic motives are dominant in the remitting decision. Inflation increase has a negative effect on the real income of households. To offset this income effect, emigrants prefer to remit more.

Table.1: A comparison of common explanatory variables used in some of the econometric studies on the macroeconomic determinants of official remittance flows in the literature

	El-Sakka, Mcnabb (1999) Egypt	Straubhaar (1986) Turkey	Huang, Silva (2005)[2] Mexico	Aydas,Neyapti Ozcan (2005)[3] Turkey	Elbadawi, Rocha (1992) North Africa South Europe	Gupta (2005) India
Explanatory variables:						
Stock of workers Abroad				NS[4]	+	
Income level in the home country			NS	-		
Income level in the host country			+	+	+	+
Domestic inflation	+		NS	-	-	
Possibility to become active in the host country		+	+			
Real overvaluation of the domestic currency		NS	NS	NS		
Interest rate differential[5]	-	NS		+		
Wage available in the host country	NS[6]	+				
Black market premium of the home country	-			-	-	
Political instability Variable		-		-		

In most of the cases, host country effects are much more significant than the home country effects. This finding has many important policy implication especially for the migrant exporting countries for which remittances are the main foreign exchange funding. For example, Huang, Vargas-Silva (2005) tries to determine whether the host and/or home country macroeconomic conditions are the ones affecting remittances and they find that host country economic conditions seem to be the most important factor driving remittances. They find no significant effect of home country economic conditions on remittances. They first develop a model (Box.1) and then use a vector error correction model (VECM) to study this relationship. They argue that they use VECM because these models can solve the endogeneity problem between remittances and other macroeconomic variables. Another important point in their paper is that they use unemployment as a proxy of host country income because they say

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[2] The reported results are for Mexican remittances inflows as the dependant variable

[3] The reported results are for the estimation of the remittance flows for the 1979-1993 periods.

[4] "NS" for not significant, "-" for significantly negative and "+" for significantly positive

[5] Indicates the difference between home and host country interest rates respectively

[6] The lagged variable for the wage available in the host country is significantly positive

that unemployment rate can be a better reflection of the income generating opportunities of emigrants than the GDP.

BOX.1. A Model for Macroeconomic Determinants of Remittances

Huang and Vargas-Silva (2005) develop a theoretical model in which they establish explicitly the relationship of remittances with home and host country macroeconomic conditions. We will present their model and its main implication very generally.

They use a two period model I which remittances are sent in the first period. They assume that they have an individual (emigrant) living in a foreign (host) country and his utility depends on his consumption in the host country (c^1) and the consumption of the household in the home country (c^*). The utility function of the emigrant in the first period is $U(c^1, c^*)$ with $U_1 > 0, U_{11} < 0, U_2 > 0, U_{22} < 0$. The consumption of the household in the home country depends on income and remittances received (αr) where α is the cost associated with sending remittances $(\alpha \leq 1)$.

The household income is $(y^* + \pi Y^*)$ where π reflects the relationship between the economic conditions of home country and household income. The household consumption is given by $c^*((y^* + \pi Y^*), \alpha r)$. The emigrant's income is $(y^1 + vY^1)$ where v reflects the relationship between the economic conditions of host country and emigrant's income.

The income restriction of the emigrant in the first period is:
$$y^1 + vY^1 = c^1 + r + s \qquad\qquad v \geq 0$$

Where s is the percentage of emigrant's income which he saves in the host country.

In the second period the household migrates to the host country and joins the emigrant (assuming that the emigrant returns to the home country and joins the household does not change results). The maximization problem is then:
$$\underset{\{c,r,s\}}{Max} U(c^1, c^*) + \beta V(c^2)$$
$$\text{s.t} \qquad y^1 + vY^1 = c^1 + r + s$$
$$\text{and}$$
$$c^2 = y^2 + vY^2 + (1+i)s$$

Where $V(c^2)$ is the utility from second period consumption, β is a discount factor.

The main implications of the model are:
$$\frac{\partial r}{\partial Y^1} \geq 0 \Rightarrow \text{An improvement in the economic conditions of the host country has a}$$
positive effect on remittances
$$\frac{\partial r}{\partial Y^*} \leq 0 \Rightarrow \text{An improvement in the economic conditions of the home country will be}$$
accompanied by a decrease in remittances.

Gupta (2005) analyse the macroeconomic factors that might explain the dynamics of remittances to India. His econometric analysis shows that most of the macroeconomic factors are insignificant in explaining the behaviour of remittances around the trend over time. One of the variables found to have an effect on remittances behaviour is the earning of migrants. On the other hand, the source country economic activity also has an effect on remittances. For the Indian case, remittances are higher during periods of low economic growth in India.

Another paper analysing the macroeconomic determinants of remittances is that of Elbadawi and Rocha (1992). They estimate a model using data from five major labour-exporting countries of North Africa and Europe: Morocco, Portugal, Tunisia, Turkey and Yugoslavia in order to find the determinants of worker remittances. They find evidence that stock of migrant labour has a positive and significant effect on remittances. In spite of this positive relationship, they find that the length of stay and the share of females in total migrant population have a negative and significant effect which shows the importance of weakening of ties with the home country. With regard to the macroeconomic determinants of migrant remittances, the authors first find that the real income in the host country has a positive and significant effect with en elasticity ranging between 0.6 and 0.8. Second, they find that official remittances are negatively affected by a rising black market premium in the country of origin. The domestic rate of inflation is also found to have a negative and significant effect on remittances.

Aydas et al. investigate the effect of macroeconomic variables on workers remittances flows to Turkey. Their study is based on time series analysis using data for the period 1964-1993. The regression results for worker remittances flows with the control of stock of migrants abroad indicate that stock of migrants appears to affect remittance flows for the 1965-1993 periods but not for the 1979-1993 periods. The authors consider this as a result of the weakening of the family ties of workers living abroad with Turkey over time. This can also be due to the increased family unification which decreases the number of person that the migrant worker is responsible for in his country of origin. The significance of black market premium and per capita income of Turkey disappears in the 1965-1993 period. On the other hand, both domestic inflation and domestic growth become significant in the 1979-1993 periods with negative and positive signs respectively. The authors conclude that the significance of these two variables, as indicators of economic stability, in explaining total remittance flows, combined with earlier observations, indicates that in the period after 1979,

investment becomes an effective motive for the remittance flows in Turkey besides the consumption smoothing motive.

2.3. An estimation of the macroeconomic determinants of remittance flows to SEMCs

In this section, we are going to make a case study for Turkey, Algeria, Morocco, Tunisia and Egypt in order to analyze the macroeconomic determinants of migrant remittance flows. Our aim in this study is to determine which motive (altruism, insurance or investment) dominates the remitting decision of SEMC migrants and to analyze if the home country macroeconomic conditions have an impact on the remittances or not.

The variables employed in this study are: official cash remittances (REM), income of countries of origin (GDPCAP), income level in the host countries which is weighted by the number of migrants living in these countries (GDPCAPHOST) or the civilian employment (EMPHOST)[7] as a proxy of migrants' income level in the host country, domestic inflation rate (INF), the ratio of the interest rates between SEMCs and the host country (TIDIF)[8] and the real effective exchange rate weighted by the share of migrants in host countries (TXCHANGE) (see Annexe 3. for more details).

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[7] For Egypt and Algeria, we have used GDPCAPHOST. In the case of Egypt, this choice was due to the non availability of data. In the case of Algeria, our civilian employment series were integrated of order 2 and we couldn't use them in our error correction model. Also in the panel estimation, GDPCAPHOST is used because Algeria is in our panel specification.

[8] The official cash remittances, domestic inflation rate, current GDPs (in USD dollars), nominal exchange rates and the interest rate variables are from World Bank WDI and GDF databases. The migrant population datasets are taken from OECD and CARIM databases. Employment series are from OECD database.

To minimize the effect of using aggregated data on the estimation results, host country variables (interest rate, GDP/Capita in the host countries and the civilian employment in the host countries) are recalculated by using indexes which are constructed with respect to main SEMC migrant receiving countries. We have used OECD and CARIM datasets to determine the main SEMC migrant receiving countries and their relative importance. We gave weights (W) to receiving countries (i) based on their share of migrant stock (MS) for each of the countries in our sample (j) in the total migrant population of each country[9].

$$Wi = \frac{MS_{i,j}}{MS_j}. \qquad i = 1,.....,n \text{ for n>1\%} \quad , \quad j=1,2,3,4,5 \text{ , (SEMCs)}$$

Our first variable is the income level of the migrant in its host country. Whatever the motivation of the migrant is, the expected sign of this variable is positive. If the earnings of the migrant increase, he will remit more.

Our second variable is the income level of the family of the migrant. If the altruistic motivations dominate the remitting behaviour, the expected sign of this variable is negative. When the income of the family in the home country decreases, the migrant will send more money in order to assure the same level of the utility for his family. In the case of insurance motivation, a decrease in the income of the family in the home country will also decrease the remittances, because the migrant will think that his assets at home are not properly taken care of. This also means that the bargaining power of the family decreases. This is also valid for investment motives. When the income of the family in the home country increases, the migrant will send more money for financial investments or for inheritance reasons, because his potential of inheritance will increase.

Our third variable is the domestic inflation in the home country. When the altruistic motives dominate the remitting decision, the expected sign of the inflation variable will be positive. With an increase in the inflation in the home country, the real income of the family will decrease. To offset this decrease, the migrant will remit more. However, in the case of

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[9] All results for five countries are discussed in the first part of this paper and reported in Annexe 1

insurance motivation, the migrant will prefer to remit later for not to afford the inflationist effect. In the case of investment motivation, inflation would not have any effect.

One another variable is the interest rate differential variable. This variable is determinant in the case of investment motivation. It is expected sign is positive for financial investments and negative for the investments in housing.

Our last variable is the exchange rate between the migrant's host and origin countries. When altruistic motivations are determinant, for an appreciation of the origin country's currency, the expected sign of this variable is positive. To ensure the same amount of income in the national currency, the migrant is obliged to send more in foreign currency. However, in the case of depreciation, the migrant can decrease the amount of remittances because he can ensure the same amount in the local currency with less foreign currency. If the family contracts are the dominant motivation in the remitting decision, the expected sign of this variable is negative for both investment and insurance motivations. The impact of an appreciation of the local currency in the case of insurance motivation would be the same as the impact of inflation. The migrant would prefer to remit more later to offset the impact of the appreciation of the local currency (because he must send more money in the foreign currency). In the case of investment motives, especially for the investments in housing, the migrant is expected to decrease the amount of remittances in the case of an appreciation of the origin country's currency. This is because, the cost of the construction increases in the currency of his host country.

Table.1: Main macroeconomic determinants of remittances and their impact

	Altruistic	Family Contracts	
		Exchange	Investment
Income level in the host country	+	+	+
Income level in the home country	-	+	+
Domestic inflation In the home country	+	-	
Interest Rate Differential			+/-
Exchange Rate	+	-	-

Most of the studies in the literature use the ordinary least squares to estimate the relationship between remittances and macroeconomic variables (see for example El-Sakka, Mcnabb (1999), Straubhaar (1986), Aydas, Neyapti Ozcan (2005)). One of the most important methodological problems in the remittances literature is the non-stationary problem. Also, if two series are non-stationary, we may experience the problem of "spurious" regression. This occurs when we regress one non-stationary variable on a completely unrelated non-stationary variable, but yield a reasonably high value of R^2, apparently indicating that the model fits well.

In this paper we are going to estimate separate error correction models (ECM) for Turkey, Algeria, Morocco, Tunisia, and Egypt. The estimation period depends on the availability of data for each country and reported at the bottom of the estimation results table 3. We use ECM models because, on one hand, we are working with integrated time series and on the other hand, this dynamic model, in which the movement of the variables in any periods is related to the previous period's gap from long-run equilibrium, give us the possibility to calculate the short and the long run relationships. If series are cointegrated, in intuitive terms this implies that they have a long run equilibrium relationship that they may deviate from in the short run, but which will always be returned to in the long run. Our general error correction model is :

$$
\begin{aligned}
\Delta Log(REM_{i,t}) = {} & \beta_i \cdot \Delta Log(GDP/CAP_i)_{-n} + \delta_i \cdot \Delta Log(EMPHOST_{i'})_{-n} + \varepsilon_i \cdot \Delta Log(GDP/CAPHOST_{i'})_{-n} \\
& + \phi_i \cdot \Delta Log(INF_i)_{-n} + \rho_i \cdot \Delta Log(TIDIF_i)_{-n} + \alpha_i \Delta Log(TXCHANGE_{i'})_{-n} \\
& + \gamma_i \left[\begin{array}{l} Log(REM_i)_{-1} - \psi_i Log(GDP/CAP_i)_{-1} - \lambda_i \cdot Log\left(EMPHOST_{i}_i \right)_{-1} - \mu_i \cdot Log(GDP/CAPHOST_{i'})_{-1} - v_i \cdot Log(INF_i)_{-1} \\ - \theta_i \cdot Log(TIDIF_i)_{-1} - \tau_i .Log(TXCHANGE_{i'})_{-1} - c_i \end{array} \right] + \varepsilon_{i,t}
\end{aligned}
$$

$i = country$

$n = 0,..1\,lags$

Our estimation results are reported in Table.3.

Table.3.Regression results (Dependent variable $\Delta LOGREM$)	Algeria	Tunisia	Morocco	Turkey	Egypt
$\beta_i \cdot \Delta Log(GDP/CAP)$	-1,72 **	0,60 **	0,50 ***	-0,75 **	1,23 **
	-2,3	2,26	3,14	-2,13	2,76
$\delta_i \cdot \Delta Log\left(EMPHOST\right)$		2,88	-0,17	0,55	
		1,39	-0,10	0,64	
$\varepsilon_i \cdot \Delta Log\left(GDP/CAP(HOST)\right)$	1,95 **				-0,41
	2,62				-0,82
$\phi_i \cdot \Delta Log\left(INF\right)$	-0,05	-0,07			
	-0,78	-0,79			
$\varphi_i \cdot \Delta Log\left(INF\right)_{-1}$			-0,08 *	-0,35 **	-0,05
			-1,86	-2,75	-0,55
$\rho_i \cdot \Delta Log(TIDIF)$	-0,57 ***	-0,36 *		-0,31 **	
	-2,89	-1,89		-2,50	
$\omega_i \cdot \Delta Log(TIDIF)_{-1}$			-0,30		0,80 ***
			-1,35		3,95
$\alpha_i \Delta Log\left(TXCHANGE_i\right)$	0,13	-2,40 ***	-3,27 ***	0,85 **	
	0,19	-4,03	-6,09	2,37	
$\pi_i \Delta Log\left(TXCHANGE_i\right)_{-1}$					-0,51 ***
					-2,97
$\gamma_i Log\left(REM\right)_{-1}$	-0,89 ***	-0,29 **	-0,65 ***	-0,93 ***	-0,75 ***
	-3,92	-2,25	-3,81	-4,40	-5,72
$\lambda_i \cdot Log\left(GDP/CAP\right)_{-1}$	-0,21	0,79	0,81 **	0,02	0,74 ***
	-0,73	0,95	2,84	0,10	3,41
$\psi_i \cdot Log\left(EMPHOST\right)_{-1}$		1.58 **	5.52 **	0,38 **	
		1,96	2,24	2,90	
$\mu_i \cdot Log\left(GDP/CAP(HOST)\right)_{-1}$	1,46 ***				0,08
	3,83				0,78
$\theta_i \cdot Log\left(INF\right)_{-1}$	0,08	-0,65 **	0,24 ***	0,69 ***	0,45 ***
	1,44	-2,11	2,99	4,90	3,93
$\nu_i \cdot Log\left(TIDIF\right)_{-1}$	-0,85 ***	-2.58 **	0,69 ***	-0,003	0,16
	-3,93	-2,68	3,32	-0,04	0,94
$\tau_i \cdot Log(TXCHANGE)_{-1}$	-1,20 ***	-5 **	-0,21	-0,29	0,24
	-3,86	-2,42	-0,47	-0,84	1,12
C			-86.15 **		
			-2,31		
t-statistics are shown under coefficients * Significant at 10% level ** Significant at 5% level *** Significant at 1% level					
Sample	1975-2004	1977-2004	1977-2004	1976-2002	1977-2004
R2	0,76	0,73	0,85	0,81	0,70
Adjusted R2	0,63	0,57	0,75	0,69	0,51
Durbin Watson	2,01	2,57	2,26	1,98	2,11

All of the variables have the same degree of integration and are I(1) (the tests are realised supposing no deterministic variables). As we are working with single-equation error correction models, existence of cointegration is tested using the methodology proposed by Ericsson and MacKinnon (2002). The test results show that cointegration exist for all countries except for Tunisia. (See Annexe.4 for the critical values) The convergence term takes its highest value for -0,93 for Turkey and -0,89 for Algeria. The convergence is slower for the others countries.

Family arrangements and investment motivations seem to dominate the remitting decision for all of the countries in our sample.

"Altruistic" type of motivations can be perceived through evolutions of the domestic inflation, particularly for Turkish and Egyptian migrants. Transfers for consumption needs of the left behind (linked to altruistic behaviour) are probably more important for the informal transfers which are widely dominant in Algeria.

Main destination for Maghrebian emigrants is Europe and these migration flows are mainly long-term migration. They prefer to stay in their host country until their retirement and often desire to build a house in their origin country for their family and for their retirement. Contrary to immigrants from Egypt, which is generally temporary migration in Gulf countries, investment in housing is an important motivation to remit for immigrants from Maghreb countries. For Egyptians, motivations like altruisme or insurance, which mainly ameliorates the consumption of the families left behind, are more dominant in the remitting decision.

Conclusion

We have shown in this paper that remittances constitute a large source of foreign transfers to the developing world and are stronger than the public aid and private capital transfers. Thus, international organizations or home and host country governments consider remittance flows as an engine of development. Concerning the determinants and the impact of remittances, the theoretical literature presents very heterogeneous results both at the micro

and at the macroeconomic level. Concerning the empirical literature, this heterogeneity of results does not change.

In the light of these findings, we have made an econometric analysis of the macroeconomic determinants of migrant remittances using an error correction model for five SEMCs. Our results mainly show that remitting decision within family contracts (insurance motivation) dominates remitting decision with purely altruistic motivations. For the migrants originating from Maghrebian region, investment in housing for their retirement or for holidays is an important motivation to remit contrary to Egyptian migrants who work generally under temporary contracts.

Bibliography

Alba F., Garson J.-P. and Mouhoud E. M. (1998)**,** « Migration Policy in a Free Trade Area : the issue of convergence with the economic integration process », in OCDE Migration, Free Trade and Regional Integration in North America, Paris.

Aydas O.T., Neyapti B., Metin-Ozcan K. (2005), "Determinants of Workers Remittances: The Case of Turkey", Emerging Markets Finance and Trade, vol 41, n°3, May-June, pp 53-69.

CARIM (2005), "Mediterranean Migration, 2005 Report", edited by P. Fargues, Euro-Mediterranean Consortium for Applied Research on International Migration, (CARIM).

Cogneau et Gubert [2005] « Migrations du Sud et réduction de la pauvreté : des effets ambigus pour les pays de départ », in Mouhoud E.M. ed. (2005) "Les nouvelles migrations: un enjeu Nord-Sud de la mondialisation", Universalis, Paris.

El-Sakka, M.I.T, and R. Mcnabb (1999), "The Macroeconomic Determinants of Emigrant Remittances", *World Development*, Vol.27, No.8, pp.1493-1502

Elbadawi I., Rocha R. (1992), "Determinants of Expatriate Workers' Remittances in North Africa and Europe", World Bank Policy Research Working Paper No.WPS1038

Ericsson N.R., MacKinnon J.G. (2002), "Distribution of error correction tests for cointegration", *Econometrics Journal,* vol.5, pp. 285-318

FEMIP (2006), *Study on improving the efficiency of workers' remittances in Mediterranean countries*, European Investment Bank, Rotterdam, February.

Gupta P. (2005), "Macroeconomic Determinants of Remittances: Evidence from India", International Monetary Fund, Working Paper No.WP/05/224

Huang P., Vargas-Silva C. (2005), "Macroeconomic Determinants of Workers' Remittances: Host vs. Home Country's Economic Conditions", EconPapers: International Finance, 2005 - econwpa.wustl.edu

Lucas R.E., Stark O. (1985) « Motivations to Remit: Evidence from Botswana », *Journal of Political Economy*, vol. 93, n° 5, p. 901-918.

Mouhoud E.M, Oudinet J. (2006) Migrations et marché du travail dans l'espace européen, Economie Internationale, La revue du CEPII, La Documentation Française, n°105, 1er trimestre, p 7-39.

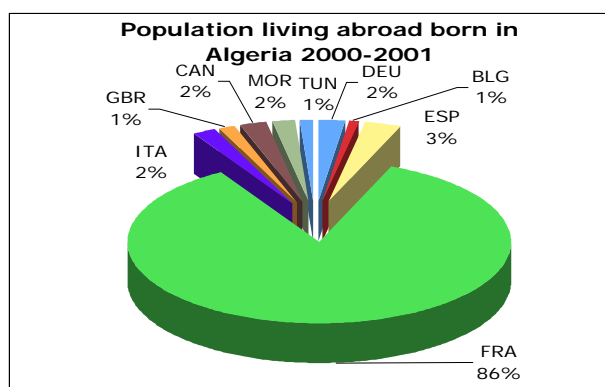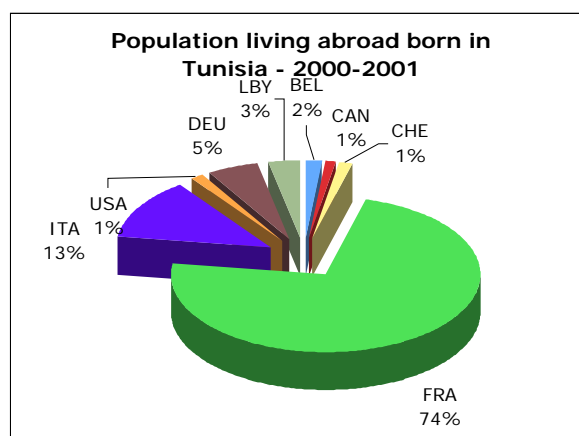Mouhoud E.M., Oudinet J. (2007) L'Europe et ses migrants : ouverture ou repli ?, éditions L'Harmattan, Paris.
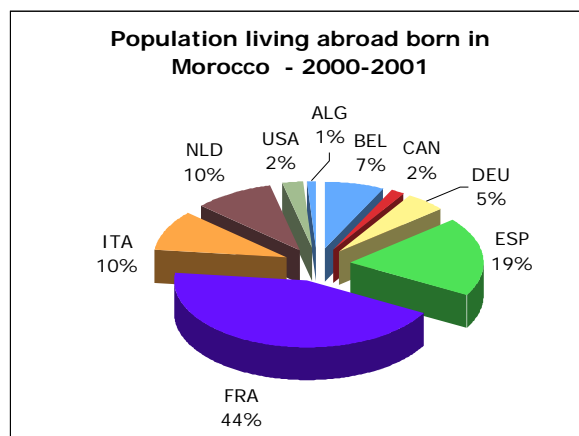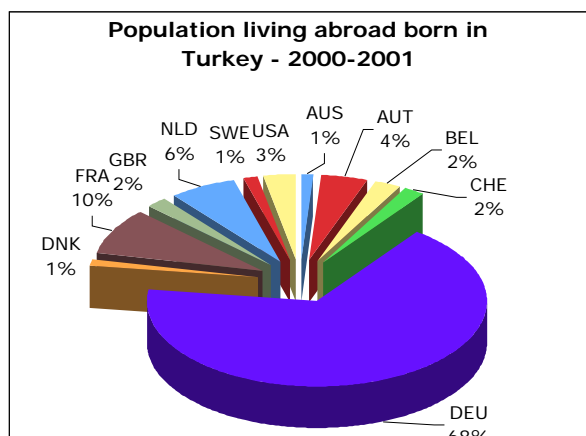
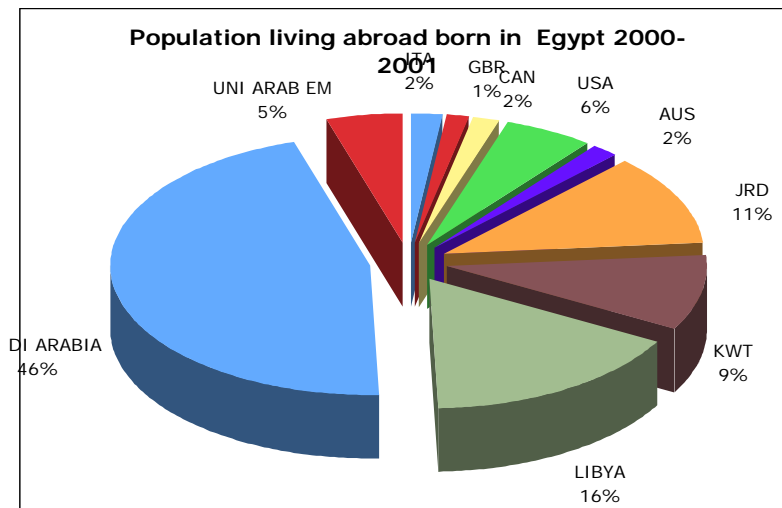OECD, (2006) , "International Migration Outlook", OECD Publishing

Rapoport H., Docquier F. (2006), " The Economics of Migrants' Remittances", Handbook on the Economics of Reciprocity, Giving and Altruism, Elsevier

Straubhaar T. (1986), "The Determinants of Workers' Remittances: The Case of Turkey", *Weltwirtschafliches Archiv*, 122, pp.728-740

Annexes

Annex 1. Migrant Stocks in the main receiving countries

Population living abroad born in Turkey - 2000-2001

NLD 6%
SWE 1%
USA 3%
AUS 1%
AUT 4%
BEL 2%
CHE 2%
GBR 2%
FRA 10%
DNK 1%
DEU 68%

Population living abroad born in Morocco - 2000-2001

ALG 1%
NLD 10%
USA 2%
BEL 7%
CAN 2%
DEU 5%
ESP 19%
ITA 10%
FRA 44%

Population living abroad born in Tunisia - 2000-2001

LBY 3%
BEL 2%
DEU 5%
CAN 1%
CHE 1%
USA 1%
ITA 13%
FRA 74%

Population living abroad born in Algeria 2000-2001

CAN 2%
MOR 2%
TUN 1%
DEU 2%
BLG 1%
GBR 1%
ESP 3%
ITA 2%
FRA 86%

Source: OECD Database and CARIM database

Annex 2. Percentage weight of countries in host countries GDP level and interest rates calculations

	TURKEY	MOROCCO	TUNISIA	ALGERIA	EGYPT
ALG		1,2%			
AUS	1,0%				1,7%
AUT	4,4%				
BEL	2,5%	7,2%	1,7%	0,9%	
CAN		1,6%	1,2%	2,4%	1,8%
CHE	2,1%		1,2%		
DEU	67,2%	4,9%	5,2%	2,2%	
DNK	1,1%				
ESP		19,4%		3,0%	
FRA	9,1%	43,9%	73,0%	85,3%	
GBR	1,9%			1,3%	1,2%
ITA		9,6%	12,8%	2,0%	2,0%
JRD					11,2%
KWT					9,4%
LBY			3,4%		16,5%
MOR				1,8%	
NLD	6,4%	9,6%			
SAUDI ARABIA					45,8%
SWE	1,2%				
TUN				1,2%	
Uni. ARAB EMIRATES					4,7%
USA	3,2%	2,5%	1,5%		5,6%

Annex 3. Calculation of real effective exchange rates:

The real effective exchange rate series are computed as the weighted geometric average of the price of the origine country of migrants relative to the prices of host countries of migrants. The parners are weighted using the share of migrants in each country. These shares are reported Annexe 2. The real effective exchange rate can be expressed as :

$$ REER = \prod_{j \neq i} \left[\frac{P_i R_i}{P_j R_j} \right]^{W_{ij}} $$

where, P_i price index of country i, (i: migrant's origine country)
R_i nominal exchange rate of country i's currency in US dollars,
P_j price index of country j, (j: migrant's host country)
R_j nominal exchange rate of country j's currency in US dollars,
W_{ij} country j's weight for country i.

The source of the price index and nominal exchange rate data is World Development Indicators (WDI) published by World Bank. Only for Germany, for the price index date, International Financial Statistics (IFS) published by IMF is used. In the computed indices, the base year is 2000 (2000=100).

Annexe 4. Empirical t-values and critical values for the ECM statistic (Ericsson and MacKinnon (2002))

	Empirical t-value	Critical value		
		1%	5%	10%
Algeria	-3,92	-4,89307064	-3,93213598	-3,47067208
Tunisia	-2,25	-4,94913301	-3,94634132	-3,47051875
Morocco	-3,81	-5,39998828	-4,33299102	-3,83444141
Turkey	-4,4	-4,98304102	-3,95509297	-3,47075469
Egypt	-5,72	-5,02205556	-3,9653	-3,47131111