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INSTITUTIONAL QUALITY EFFECT ON REMITTANCES IN THE MENA REGION

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Abstract

International worker's remittances have increased over the years to become a main source of income for developing countries. Workers' remittances have surpassed foreign direct investment and foreign aid. They proved to be particularly resilient during the latest global crisis, unlike other capital flows that fell sharply or even turned negative, especially for Middle East and North Africa (MENA) countries. Given the magnitude, and the stability of remittances, this paper aims to test the effects of institutional characteristics via the composite risk index on remittances inflows in MENA region. In order to deal with the possible endogeneity problem, a seemingly unrelated equation system" (SURE) proposed by Arnold Zellner, (1962) is used to estimate a model with endogenous variables for a sample of 15 MENA countries over the period 1984-2011. We highlight a negative relationship between remittances and the composite risk implying an increase of remittances when risk increases in the specific case of MENA. This result proves an altruistic motivation of the MENA migrant's decision to remit.

JEL Classification: F22, F24, E, C33, C23

Keywords: Remittances, Composite risk, Macroeconomics determinants, MENA, Institutional quality, Panel data.

ملخص

زادت تحويلات العاملين من الخارج على مر السنين لتصبح المصدر الرئيسي للدخل بالنسبة للبلدان النامية. تجاوزت هذه التحويلات الاستثمار الأجنبي المباشر والمساعدات الخارجية. فقد تبين أن هناك مرونة خاصة خلال الأزمة العالمية الأخيرة، على عكس تدفقات رؤوس الأموال الأخرى التي انخفضت بشكل حاد أو حتى تحولت سلبا، وخصوصا لمنطقة الشرق الأوسط وشمال أفريقيا (MENA). ونظرا لضخامة واستقرار التحويلات، تهدف هذه الورقة لاختبار تأثير الخصائص المؤسسية عبر مؤشر الخطر المركب على تدفقات التحويلات في منطقة الشرق الأوسط. من أجل التعامل مع مشكلة الجوانب الداخلية المحتملة، ونظام المعادلة التي تبدو غير ذات صلة (بالتأكيد) التي اقترحها آرنولد Zellner، (1962) والذى يستخدم لتقدير نموذج مع المتغيرات الداخلية لعينة من 15 دول المنطقة خلال الفترة 1984-2011. نسلط الضوء على العلاقة السلبية بين التحويلات وخطر المركب مما يعني زيادة التحويلات عندما يزيد الخطر في حالة محددة من الشرق الأوسط. تثبت هذه النتيجة حافزا الإيثار لقرار المهاجر للتحويل.

1. Introduction

International remittances refer to money and goods sent by migrants to their families back in their native countries. International worker's remittances have increased over the years to become a main source of income for developing countries. According to the World Development Indicators, global remittances to Middle East and North Africa (MENA) countries were important in 2012 (40 US$ billion). Lebanon and Egypt received the biggest amount of remittances (Figure 1). There is a distinguished line of literature that studies the contribution of remittances to development. For example remittances improve recipients' standard of living and encourage households' investment in education and healthcare. In fact, remittances hold first place as percent of GDP in the MENA region and workers' remittances have surpassed foreign direct investment (FDI) and official development assistance (ODA) (Figure 2). Remittances finance also imports, which is good for the balance of payment (Glytsos 2002, Ledesma and Piracha 2004, and Cham et al. 2005). Given the magnitude, stability and potentially beneficial macroeconomic effects of workers' remittances, the purpose of this study is to research factors and determinants of their evolution.

These inflows to the MENA region proved to be particularly resilient during the latest global crisis, unlike other capital flows that fell sharply (Figure 2). In fact, Bettin, Lucchetti and Zazzaro (2009) confirmed that political instability in the home country, instead, urges immigrants to Australia to help relatives at home. However, Singh, Haacker and Lee (2009) found that Sub-Saharan Africa's countries with better institutions and a stable political system would receive more remittances. As far as we know, no previous study has attempted to analyze how the level of risk can affect the level of international remittances received in MENA countries from their outside labor nationals. Thus, this paper uses a panel dataset from the MENA region to find the effect of certain macroeconomic variables on remittances, in particular the relationship between remittances and the composite risk index rating three subcategories of risk: political, financial, and economical. The paper is organized as follows. Section 2 reviews the relevant existing literature on the determinants of remittances, places this study in context and outlines the theoretical consideration. Section 3 explains the data and methodology using an empirical model. Section 4 analyses the findings. Section 5 provides concluding remarks.

2. Literature Review on Determinants of International Remittances

The literature on the determinants of international remittances has tended to fall into two broad approaches, microeconomic and macroeconomic (Docquier and Rapoport 2003). The microeconomic determinants deal with socio demographic characteristics of migrants and their families such migrant income, education level, marital status, age, gender, duration level, migration costs, migrant's spouse, and wealth (Agarwal and Horowitz 2002; Germenji; Beka and Sarris 2001; Gubert 2002; Dorantes and Pozo 2006). The macroeconomic approach considers macroeconomic variables of the sending as well as receiving countries. In this case, researchers have used aggregate data that affect the behavior of remitting such economic situation, interest rates, exchange rates, wage rates and inflation (El-Sakka and McNabb 1999; Faini 1994; Glytsos 1997; Higgins, Hysenbegasi, and Pozo 2004; Niimi et al. 2010; Docquier et al. 2012 Singh 2012; Yuni, Omeje and Asogwa 2013).

When investigating the determinants of remittances, it is important to recognize that migrants have many motivations to send flows back to their native countries. Lucas and Stark (1985) hypothesized that migrants are motivated to remit for a variety of reasons such as "pure altruism", "pure self-interest" and "tempered altruism". They argued that migrants are seen to be altruistic if their remittances are positively related to their income (Funkhouser 1995). This means that migrants care about the wealth and consumption of their families in

their native countries (Lucas and Stark 1985). In addition, Agarwal and Horowitz (2002) found that remittances increase to compensate relatives for negative shocks to their income. Migrants may be motivated also by "self-interest" and they might send remittances to improve their social status or to keep a relationship with their families with the aspiration to inherit or to invest in the future (Aydas et al. 2005). In this context, Durand and al. (1996) found that migrants sent remittances to their native country to accumulate physical or financial assets back home. Lucas and Stark (1985) argued that the self-interest motivation would be considered dominant if remittances were positively related with family income at home. On the other hand, for the motivation of "tempered altruism", there is a mutually beneficial contractual arrangement between the migrant and the family at home (Hoddinott 1994; Ilahi and Jafarey 1999). In this case remittances may be seen in an exchange framework, where they represent a payment by the migrant for services provided by family members in the home country, such as taking care of his relatives or properties (Cox 1987; Cox et al. 1998).

This paper focuses on the macroeconomic approach. In fact, empirical evidence on macroeconomic determinants of remittances is mixed. One of the first studies using this category is the Swami's study (1981) for Greece, Turkey, and Yugoslavia. Glytsos and Katselli (1986) and Ojapinwa (2012) found a negative effect of inflation, while Denis Yuni, Omeje and Asogwa (2013) proved that high inflation in home country increased the flow of remittances back home. Financial development has been found to have a negative effect on remittances in recipient country. Bettin, Presbitero and Spatafora (2013) affirmed that 1% reduction in the level of financial development translates into 0.9% increase in migrants' transfers. This result suggests that remittances may help overcome the financing constraints of households living in countries with less efficient financial institutions, in line with Giuliano and Arranz (2009). However, Aydas, Ozcan and Neyapti (2005) argued that the development of financial intermediation policy in Turkey increases the flow of remittances. Agarwal and Horowitz (2002), Gubert (2002) and Barua, Majumder and Akhtaruzzaman (2007), showed that remittances increase if domestic production in the home country decreases. However, Fajnzylber and López (2008) found that economic growth in the recipient countries increases remittances to Latin America. Adams (2009) used skill composition of migrants, poverty, interest and exchange rates to examine the determinants of remittances. He concluded that the skill composition of migrants matters in remittance determination. Countries exporting a larger share of high-skilled migrants receive fewer remittances than countries exporting a larger proportion of low-skilled migrants. In addition, he also proved that the level of poverty in a labor-sending country have a negative impact on the level of remittances received. In contrast, remittances received are positively related to investment returns. Wahba (1991) argued that political stability and consistency in government policy and financial intermediation affect remittances. In addition, Aydas, Ozcan and Neyapti (2005) reveled, that the military regime had a negative effect on remittance in Turkey during the period 1965-1993. According to Straubhaar (1986), confidence in the safety and liquidity of savings is more important than the possibility of higher returns. El Bouhadi, El Mustapha and Kchirid (2008) affirmed that remittances in Morocco are largely explained by agricultural GDP and the exchange rate. Faini (1994) found that the real exchange rate is also a significant determinant of remittances. Singh, Haacker, and Lee (2009) found that remittances depend on institutional quality in the home country. They considered that countries with better institutions and a stable political system would receive more remittances relative to GDP. In addition, they found that the remittances depend positively on democracy, human rights, good public governance, the quality of the judicial system, the quality of economic infrastructure, and the social and institutional tax system (see also Singh, Haacker and Lee 2009). However, Bettin, Lucchetti and Zazzaro

(2009) confirmed that political instability in home country, instead, urges Australian immigrants to help relatives at home. On other hand Yang (2008), Mohapatra et al. (2012), Ebeke and Combes (2013) found that remittances react positively to natural disasters.

This paper uses panel data of MENA countries and employs a new variable evaluating economic, financial and political risk, which is the composite risk index, in order to explain remittances inflows and to clarify the effect of the risk and other aggregate data on remittances in the MENA region.

3. Data and Methodology

3.1 Data

In order to assess the macro-economic determinants of remittances in the MENA region, a panel regression analysis of 15 countries (N=15) from 1984 to 2011 (T=28) is performed. The countries are Algeria, Egypt, Iran, Iraq, Israel, Jordan, Lebanon, Libya, Turkey, Morocco, Oman, Saudi Arabia, Syria, Tunisia and Yemen. These countries were chosen because it was possible to find relevant data on their remittances inflows for the period 1984-2011 and they are from the top emigration countries in the region.

This study includes data of the labor-sending country and provides macroeconomic analysis of remittance determinants (Glytsos 1997; El-Sakka and McNabb 1999; Lianos 1997; Freund & Spatafora 2005; Higgins et al. 2004, Singh et al. 2009; Bang Mitra Wunnava 2013). Those data are from the World Development Indicators (WDI). However, the composite risk index comes from International Country Risk Guide (ICRG). Data of international remittances used in this study are the sum of two items defined in the sixth edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employee. According to the World Bank, personal transfers consist of all current transfers in cash or in kind received by resident households from nonresident households. However, compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities. We consider in our study the natural logarithm of remittance (in 2005 constant US$). Nevertheless, it should be emphasized that the volume of remittances is underestimated because it only incorporates data on official remittances, which are transferred through official channels. In fact, there is a large proportion of remittance transmitted through unofficial channels.

The composite risk data used in this paper comes from the International Country Risk Guide (ICRG). The composite risk variable estimates 22 variables grouped into 3 sub-categories: political, financial and economic risk. The political risk rating contributes 50% of the composite rating, but the financial and economic risk ratings each contribute 25% . The Political Risk index is based on 100 points, Financial Risk on 50 points, and Economic Risk on 50 points. The total points from the three indices are divided by two to produce the weights for inclusion in the composite country risk score[1]. The composite score ranges from zero to 100. The highest overall rating, theoretically 100, indicates the lowest risk and the lowest rating (theoretically zero) indicates the highest risk.

In addition, we include in our model other aggregate data as follows. The domestic credit provided by the banking sector as a percentage of the GDP is used to estimate financial development in order to explain remittances. We also introduced the economic growth variable (the GDP growth rate), to test if remittances might be affected by economic shocks

[1] The following formula is used by ICRG to calculate the aggregate of composite risk[1]:
Composite risk (country X) = 0.5 (PR + FR + ER), Where: PR = Total political risk, FR = Total financial risk, ER = Total economic risk.

in the home country. We used the ratio of gross fixed capital formation, as a percentage of the GDP for the public and the private sectors, as the level of investment in origin country. Trade openness is measured by the ratio of the sum of imports and exports relative to the GDP to explain trade. The ratio of inflow and outflow of foreign direct investment as a percentage of the GDP represent the financial openness variable. We used the gross enrollment rate in secondary school to express the level of human capital. Finally, we added the inflation rate as measured by the consumer price index (annual %), the deposit interest rate (%) paid by commercial or similar banks and the official exchange rate calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar). All of these variables are about the receiving countries.

The Table 1 reports a summary of our data statistics for the period of study 1984 to 2011. The average of remittances is 2.47 U$ billion and the log of remittances' average is about 21.25. The mean of the risk index is 61%, which reflects a moderate risk in the MENA region. The average of natural logarithm of remittances is 21. Appendix A presents the summary statistics of the county sample composite risk index that indicate that the highest risk is in Iraq with an average of 37% and the lowest risk is in Oman (73%). The mean growth rate within the sample is 4%, we estimate that the lowest rate of economic growth refers Lebanon in 1989, during the war. Investment as a percentage of GDP has an average of 22%. Trade openness reached an average of 68%. The inflation rate has an average of 17% but the maximum refers to Iraq's inflation due to a long period of instability and war in the country. However, financial development expressed by the credit percentage of GDP has an average of 0.48%, which is relatively low. The financial openness mean for MENA countries is also low (2.2%). The interest rate exhibits an average of 13.7% and a percentage of 438% for Israel in 1984, but this country has an interest rate close to the sample average value since 1986 (18%). The official exchange rate of the local currency has averaged 388; the maximum value of 10616 is for the case of Iran in 2011.

3.2 Methodology

In order to estimate the impact of the composite risk and other macroeconomics variables on remittances, our baseline model is the following one:

$$\text{Log Remittances}_{it} = \beta_0 + \beta_1 \text{ composite risk}_{it} + \beta_2 X_{it} + u_{it} \qquad (1)$$

Where $\boldsymbol{X}$ refers to vector of explanatory variables and u present the error term. The data was subjected to econometric tests. We begin our study with the stationary test which shows that our variables are stationary excluding the variable of financial development (credit to the private sector/GDP) which is integrated of order "1", we then use this variable in the first difference to be stationary (Appendix B). The correlation test shows that there is a correlation between "inflation" and "interest rate" (Appendix C). The multi- collinearity refers to a situation in which two or more explanatory variables are very closely related. As a result, we cannot distinguish the effect of a variable from the effect of the others. One of the multi-collinearity indicators is the variance inflation factor (VIF). In the estimated equations, all factors inflation variance (VIF) are less than the limit tolerated by Myers (1990) "10" and the Fox (1991) "4 or 5", the problem of multi- collinearity is then rejected (Appendix D).

We can estimate the equations (1-4) using ordinary least squares (OLS), but it is possible that several variables in our model will be endogenous to remittances. Reverse causality may be taking place (Adams 2009) and remittances may be affecting inflation and economic growth, so using OLS to estimate equations (1-4), would therefore lead to biased results. The Granger causality test shows a reverse causality for three explanatory variables inflation, interest rate and the composite risk (see Appendix E). The dual status of these variables is a source of endogeneity, which gives biased results with the Ordinary Least Squares method

(OLS). The problem is avoided in Adams and Page (2005) by using instrumental variables and in Gupta, Pattillo and Wagh (2009) by using a 3SLS system estimator. Chatelain, (2008) supposed that the endogeneity of explanatory variables could be taken into account by adding a second equation to be estimated in a simultaneous equations model. In this paper, the endogeneity issue, driven by the inverse causality, is tackled by the "Seemingly unrelated equation system" (SURE) proposed by Zellner, (1962). The advantage of this method over a cross-country panel data approach or dynamic panel data is that it considers any possible heterogeneity across countries and cross-country interdependence (contemporaneous correlation). This method used by several authors (e.g. Gregorio and Guidotti 1995; Levine et. al 2000; Rioja and Valev 2003), will help us transform our original model to obtain a model where the endogenous variable of remittances will be expressed by only exogenous variables. In this way we will avoid the endogeneity problem of inflation, interest rate and composite risk index variables. The specification for the remittances equation is expressed in equation 1. Along with this equation, other equations that capture determinants of interest rate, inflation and composite risk are also estimated. The composite risk is a function of the Log of remittances, GDP growth, government consumption, debt service, population growth, and government stability (ICRG). The interest rate is expressed by the Log of remittances, inflation, corruption, exchange rate, GDP per capita growth, investment growth and the investment profile (ICRG). Finally we choose to explain inflation with the Log of remittances, GDP growth, interest rate, law and order (ICRG), investment profile (ICRG), and exchange M2/GDP. All these variables are taken from the database of the World Development Indicators, excluding the institutional variables, which are derived from the International Country Risk Guide (ICRG). The system to be estimated is as follows:

$$\textbf{Remittances}_{it} = \beta_0 + \beta_1 \, Composite\ risk_{it} + \beta_2 \, Investment_{it} + \beta_3 Inflation_{it} + \beta_4 \, Financial\ development_{it} + \beta_5 \, GDP\ growth_{it} + \beta_6 \, Financial\ openness_{it} + \beta_7 \, Human\ capital_{it} + \beta_8 \, Trade_{it} + \beta_9 \, Exchange\ rate_{it} + \beta_{10} \, Interest\ rate_{it} + u_{1it}$$

Where:

$$\textbf{Composite risk}_{it} = \alpha_0 + \alpha_1 \, remittances_{it} + \alpha_2 \, GDP\ growth_{it} + \alpha_3 \, government\ consumption_{it} + \alpha_4 \, Debt\ service_{it} + \alpha_5 \, Population\ growth_{it} + \alpha_6 \, Government\ stability_{it} + u_{2it}$$

$$\textbf{Inflation}_{it} = \delta_0 + \delta_1 \, remittances_{it} + \delta_2 \, GDP\ growth_{it} + \delta_3 \, interest\ rate_{it} + \delta_4 \, law\ and\ order_{it} + \delta_5 \, investment\ profile_{it} + \delta_6 \, exchange_{it} + \delta_7 \, M2/GDP + u_{3it}$$

$$\textbf{Interest rate} = \varphi_0 + \varphi_1 \, remittances_{it} + \varphi_2 \, inflation_{it} + \varphi_3 \, corruption_{it} + \varphi_4 \, exchange\ rate_{it} + \varphi_5 \, GDP\ per\ capita\ growth_{it} + \varphi_6 \, investment\ growth_{it} + \varphi_7 \, investment\ profile_{it} + u_{4it}$$

Note: *It should be noted that the "inflation" and "interest rate" are included separately in the model because of the correlation problem, so we do not use the three stage least square.*

The model contains a two-stage approach. The equations of inflation, interest rate and composite risk are regressed separately using OLS and then the 4 regressions are estimated together as a system of SURE equations, which take into account the serial correlation between explanatory variables. At first look, the equations seem unrelated, but they are related by their errors terms; this is called "Contemporaneous Correlation". Pesaran (2004) proposed a test for error cross-section dependence, which is an extension of Breush and Pagan's (1980) test. It is only valid for *N* relatively small and *T* sufficiently large (Baum 2010), and this is confirmed in our case because in our annual panel we have T (28)>N (15). For that, we will use the Breusch-Pagan Covariance Matrix LM test, which can test whether contemporaneous diagonal covariance matrix is zero (independence of the errors), or if at least one covariance is nonzero (correlated errors).

Ho: No contemporaneous Correlation: covariance matrix is zero: Run OLS

H1: Contemporaneous Correlation: at least one covariance is nonzero: Run SUR

The null hypothesis of no contemporaneous correlation $E(u_{it}\, u_{js}) = 0$ and H0: $\sigma_{ij} = 0$, for $i \neq j$ must be rejected. If the errors are contemporaneously correlated, the covariance matrix is no longer diagonal and the correlation between the errors is written as follows: $E(u_{it}\, u_{jt}) = \sigma_{ij}$, i , $j = 1 \ldots 15$, $i \neq j$.

La Grange-Multiplier test suggested by Breusch-Pagan (1980), λ_{LM}, given as:

$$\lambda_{LM} = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} r_{ij}^2$$

$$\text{with } r_{ij} = \frac{\sum_{t=1}^{T} e_{it} e_{jt}}{(\sum_{t=1}^{T} e_{it}^2)^{1/2} \sum_{t=1}^{T} e_{jt}^2}$$

The λ_{LM} statistic is distributed as chi-squared (χ^2) with N (N−1)/2 degree of freedom, and r_{ij} is the correlation coefficient of residuals estimated using SURE[2] regression. e_{it} is the ordinary least squares estimate of the residuals u_{it}.

4. Findings

The test of Granger causality gives a preliminary idea of the variables that can affect the evolution of transfers such as interest rates, economic growth, the composite risk, inflation, and trade openness. However, this test does not give the sign of the relationship (Appendix C). The results of the system estimation using the seemingly unrelated regression (SURE) estimator are presented in Table 2. The four regressions take into account the correlation between inflation and interest rate variables. The Breusch-Pagan test of independence shows that the chi-square estimates are significant at 5% level for all set of equations. So the null hypothesis of no contemporaneous correlation (H0: $\sigma_{ij} = 0$, for $i \neq j$) will be rejected. This result confirms that SURE model is an appropriate technique.

The results indicate that remittances respond negatively to the composite risk index, which includes the financial, political and economic risk. We should specify that the highest overall rating, (theoretically 100), indicates the lowest risk and the lowest rating (theoretically zero) indicates the highest risk. The estimated coefficient of this variable is between -0.03 and -0.08 and it is statistically significant at 1% level. This result suggests that a 10% increase of risk in a MENA labor-sending country will increase the amount of its received remittances by 0.3% to 0.8%. This is in line with the view of Bang, Mitra, Wunnava (2013) of a sample of 84 countries but in contrast with Singh (2012) in 36 Sub Saharan African countries. It seems that the increase of risk in MENA countries encourages their migrants to send more funds back home to compensate and to assist their families for bad living conditions. We can conclude that the political risk, as the corruption, bureaucracy, governmental instability, financial instability and economic instability, may increase remittances in the specific case of MENA region. To further explain more the result we can say that the MENA migrants will continue sending money to their families whatever are the conditions in the home countries, they will even send more in case of worse conditions. This result confirms the altruistic motivation of the MENA migrant's decision to remit.

The human capital, expressed by the secondary level, has a positive sign significant at 5% (regression 2), indicating that MENA countries, which export a larger share of high-skilled migrants, receive more remittances. High-skilled migrants remit more amounts because of their higher revenues in countries of adoption; they are likely better informed on their home countries situation, and might be more capable to remit for investment. However, low-skilled

[2] This method requires that the number of time periods (T) exceeds the number of cross-section unites (N) (Baum, 2010). This is confirmed in our case because in our annual panel we have T (28)>N (15).

migrants remit less not only because of fewer revenues but also due to a more fragile and unstable situation in the adopted county (Faini 2007; Adams 2009; Niimi et al. 2010).

The level of investment has a positive effect significant at 1% (regression 3) on remittances. The high level of investment encourages migrants to send more funds. Investment opportunities in home countries motivate migrants to send more funds to invest in their countries. This result confirms the theoretical self-interest motivation. In this case, the migrant sends funds in aspiration to invest in prediction of a return in the future.

The positive and significant relation between remittances and GDP growth rate (regression 4) highlights the procyclicality variation of remittances in the MENA region. A high level of GDP growth is an indicator of economic welfare and investment opportunities in the country, which encourage migrants to remit more. When family income increases, the migrant sends more money with the aspiration to inherit or to invest or with the intent to return home. This result is confirmed by Lucas and Stark (1985) who argued for self-interest motivation if remittances are positively related with family income in the home country. At the opposite insurance motivation implies a decrease in remittances, in case of a decrease in the home country income.

Financial development, expressed by the private credit provided to the private sector, shows a significant positive coefficient (regression 3). MENA region countries would attract more remittances by developing their financial markets. This result confirms the findings of Freund and Spatafora (2005). Financial development can reduce the remittance sending fees, which will raise the amount of transferred remittances through official channels.

Inflation is an indicator, which tests the local conditions in the domestic country. Its coefficient is positive and significant (regression 2 and 3), so when prices increase, remittances inflows move upward. High inflation reduces the purchasing power of households; to compensate the migrant will send more funds to his family. This result confirms the altruistic and solidarity motivation of the migrant's decision to remit. El-Sakka and Mcnabb (1999) concluded this type of positive relationship in the case of Egypt, Denis Yuni, Omeje and Asogwa (2013) suggested that high prices make things more difficult and so there is an increasing need for remittance, resulting in increasing remittance with increasing inflation. However, Glytsos and Katselli (1986) and Elbadawi and Rocha (1992) found a negative effect of inflation on remittances for North Africa and South Europe.

Trade, is calculated by the sum of exports and imports as percentage of the GDP. This variable refers to the degrees of trade openness. We find that it has a negative effect on remittances. This result implies that more openness would reduce the amount of remittances. One reason for this negative relation could be that migrants would replace cash with noncash remittances such as gifts and equipment because of their relatively lower prices and availability in the host country than at home due to high taxes in the region. The negative effect of trade on remittances can be also explained by an indirect effect. In fact remittances have a negative shock on the exchange rate (Bouhadi, El Mustapha and Kchirid 2008). The appreciation of local currencies due to large remittances explains the negative relation with openness.

Financial openness measured by the sum of foreign direct investment outflows and inflows (as a percentage of the GDP) is significant for MENA countries. The estimated coefficient of this variable is between 0.07 and 0.11 and is significant at a 5% level (regression 2, 3 and 4). Therefore, there is a positive effect of financial openness on remittances for the MENA region. In fact financial openness improves rules of international financial transfer, which facilitate remittances operations.

The exchange rate has a negative and significant effect on transfers (regression 3) at a significance level of 5%. So in this case, the appreciation of the local home currency against the dollar leads to decreased remittances. This result is identical to that found by Dean Yang (2008) who found that Filipino migrants sent less money when the peso depreciated during the Asian financial crisis. Notice as well that, in contrast to this paper, Singh, Haacker, and Lee (2009) found that the real appreciation of the exchange rate reduces the amount of remittances.

The interest rate has a positive and significant coefficient (0.06) at a 1% level (regression 4), the deposit interest rates have then a positive effect on remittances. When the interest rate is competitive, emigrants are more motivated to send remittances to their countries of origin, that act confirms the self -interest motivation for investment.

5. Conclusion

In the specific case of MENA countries and opposite from the other regions of the word, remittances increase with economical, financial and political risk evaluated by the composite risk index. Therefore, the increase of risk encourages MENA migrants to send more funds to their countries. This result confirms the altruistic motivation of the migrant's decision to remit. MENA migrants seem to have a sensitive attachment to their families, which explains their social solidarity and altruism. Remittances are also positively affected by investment opportunities, financial development and financial openness in the home countries. The use of macro-level data to conduct our empirical estimation highlight the critical role-played by institutional quality and risk in encouraging migrants to remit savings.

MENA migrants will send more money to their families if the politic, economic, and financial risks increase in the home country. The remittances inflows in the MENA region can help mitigate shocks and risks effects on the countries. We conclude that the main motivation of remittances is altruism. Therefore, it is natural to assume that remittances are sent to the families back home due to an altruistic feeling of migrants. The representative MENA migrant cares about the socioeconomic condition, the welfare and consumption of his family. Based on this result we conclude a specific motivation to remit is the altruism and solidarity of MENA migrants.

These findings are of major significance for policy makers who seek to attract remittances. From a policy point of view, for a sustained economic growth governments have to mobilize and encourage remittances, which are grantee savings even in case of crises due to altruistic motivation of the migrants. They should then direct these funds, via an investment policy, toward productive domestic investments, exploring the self-interest side of MENA migrants' motivation. Remittances cannot grow in perpetuity without an effort from the authorities to provide facilities by:

- Developing the financial and banking infrastructure that is open, innovative and with affordable client services (we proved a positive and significant relation of financial development and financial openness with remittances).
- Strengthening the capacity of the financial market to channel remittances into productive activities, using new information and communication technologies, to efficiently transfer and use the remittances.
- Facilitating administrative procedures and formalities for investment especially for MENA resident overseas (we highlighted a positive and significant effect of investment on remittances).
- Supporting hospitality and tourism for migrants to persuade them to keep contact with their home countries and return often.

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Figure 1: Mean of Remittances (Billion U$) by Country (1984- 2012)

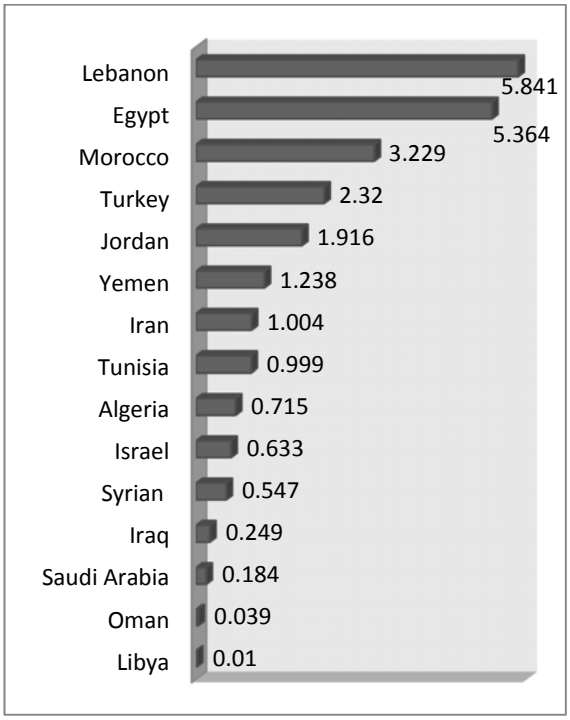
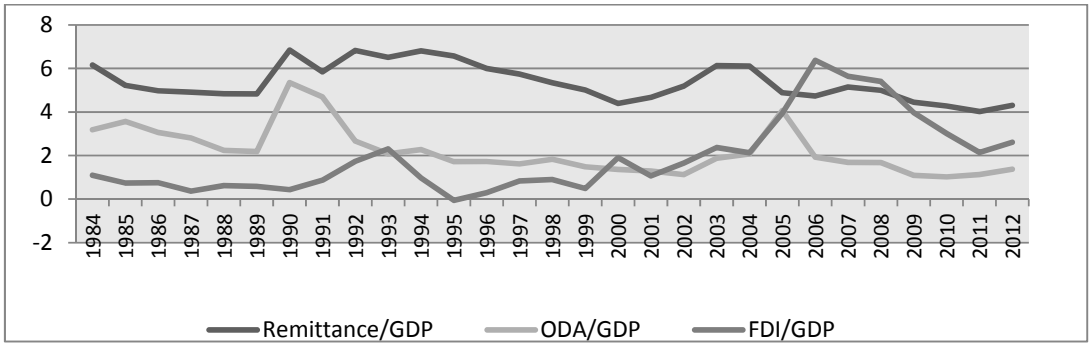


Figure 2: Remittances and Other International Flows to the 15 MENA Countries as% of GDP



Note :FDI: Foreign direct investment, net inflows, Remittances: Personal remittances, received and ODA: net official development assistance received

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Remittances (log)	294	21.25106	2.267572	14.62625	30.71495
Inflation	361	17.10824	44.35291	-16.11732	448.5
Investment	347	22.09937	5.103485	9.767839	38.32783
GDP growth	373	4.133203	6.334811	-42.45112	46.5
Financial openness	368	2.268057	3.749415	-5.111782	22.6203
Composite risk	384	61.19006	13.29383	23.33333	83.96667
Financial development	359	0.4808453	4.852044	-39.03435	16.57341
Human capital	272	74.38537	33.16358	5.3405	162.3487
Trade	363	68.90165	24.76019	10.43019	154.6453
Interest rate	300	13.70621	30.15248	1.074159	438.3583
Exchange rate	408	388.9543	1467.782	0.0003667	10616.31

Table 2: Impact of composite risk and other macroeconomics variable on remittances

	(1)	(2)	(3)	(4)
Investment	0.038	0.0500	0.133***	0.045
GDP growth	0.127**	0.121**	0.065*	0.118***
Financial openness	0.084	0.118**	0.081**	0.078**
Composite risk	-0.090***	-0.068***	-0.037**	-0.056***
Financial development	0.062	0.054	0.067**	0.020
Human capital	0.011*	0.010*		
Trade	-0.016**	-0.017**	-0.029***	-0.018***
Interest rate	0.059***			0.064***
Exchange	0.001	-0.001	-0.0002**	-0.001
Inflation		0.062***	0.036***	
Constant	25.654***	24.079***	21.953***	24.271***
N	80	80	190	131
R2	0.5682	0.5955	0.4287	0.5524
Chi2 of Breusch-Pagan test	8.539	8.596	6.757	13.003
Prob of Breusch-Pagan test	0.0361	0.0352	0.0093	0.0046

Notes: This output from STATA software. *** denote significance at 1%. ** denote significance at 5%. * denote significance at 10%

Appendix A: Summary Statistics of Composite Risk

	Mean	Min	Max
Iraq	37.90897	23.33333	60.5
Lebanon	49.29487	23.5	63.66667
Turkey	57.66795	45.5	67.4
Iran	59.11538	33.83333	71.3
Syrian	59.67115	35.83333	70.83334
Algeria	61.40962	52.66667	77.96667
Egypt	62.13077	42	71.5
Libya	62.46218	37.83333	81.56667
Yemen	62.56	45	69.03333
Israel	64.91666	48.83333	73.33334
Jordan	65.2859	46.33333	75.23333
Morocco	65.53974	44.16667	76.06667
Tunisia	65.96474	47.66667	73.56667
Saudi Arabia	70.74872	52.83333	81.86666
Oman	73.49038	58.16667	83.96667

Appendix B: Test of Stationarity

Variables	Levin, Lin & Chu t		Im, Pesaran and Shin W-stat		PP - Fisher Chi-square		Integration Level
	In level	First difference	In level	First difference	In level	En différence première	
Remittances	-1.2874**		0.4673		33.9762		I(0)
Composite risk	-3.8679***		-1.6870***		22.8810		I(0)
Human capital	-4.1733***		-1.6584***		65.6889***		I(0)
Financial openness	-2.1134***		-0.4397		37.9953		I(0)
Investment	-2.3956***		-3.2572***		50.5934***		I(0)
Inflation	-34.8815***		-13.5529***		61.0746***		I(0)
Trade	-3.3473***		-1.6958***		31.3083		I(0)
Interest rate	-1.9246***		-3.8075***		34.9782		I(0)
Exchange rate	-5167.83***		-4377.81***		259.889***		I(0)
GDP growth	-8.5693***		-8.6015***		244.565***		I(0)
Financial development	0.9614	-6.9081***	2.5767	-6.3031***	13.6145	178.106***	I(1)

Note: we used Newey-West bandwidth selection using Parzen kernel by Eviews software.

Appendix C: Correlation Test

Correlation between explanatory variables of "remittances"

	gfgdp	gdpgr	opfin	icrg_cpfer	credgdpdf	secd	tradegdp	dpinterest	exchange	inflcpi
Gfgdp	1.0000									
Gdpgr	0.1127	1.0000								
Opfin	-0.0762	0.1719	1.0000							
icrg_cpfer	0.0304	0.1282	0.3352	1.0000						
credgdpdf	0.0229	0.0256	0.1117	0.2834	1.0000					
Secd	-0.2184	-0.0128	-0.1032	0.1079	0.0349	1.0000				
tradegdp	0.1221	0.1810	0.3922	0.3893	-0.0043	-0.0005	1.0000			
dpinterest	-0.0830	-0.0666	-0.1661	-0.2799	-0.2300	0.1140	-0.2124	1.0000		
Exchange	0.1606	0.1084	-0.0527	0.1078	0.1018	0.0043	-0.0764	-0.0309	1.0000	
Inflcpi	-0.0507	-0.0352	-0.1612	-0.3671	-0.3623	0.0996	-0.1382	**0.9271**	-0.0172	1.0000

Correlation between explanatory variables of " Interest Rate"

	lnrem	Inflcpi	Exchange	icrg_corrupt	icrg_inv_prfl	gfgdpgr	gdpcapgr
Lnrem	1.0000						
Inflcpi	0.4597	1.0000					
Exchange	-0.0454	0.0095	1.0000				
icrg_corrupt	0.0767	0.1719	-0.0988	1.0000			
icrg_inv_prfl	-0.2937	-0.3066	-0.0995	-0.1718	1.0000		
Gfgdpgr	-0.0507	-0.0712	-0.0284	-0.0358	0.0916	1.0000	
Gdpcapgr	0.0585	-0.0470	0.1196	-0.1021	0.1453	0.1970	1.0000

Correlation between explanatory variables of "composite risk"

	lnrem	Gdpgr	govconexpgdp	debt_service	popgr	icrg_gov-stab
Lnrem	1					
Gdpgr	0.0757	1				
govconexpgdp	-0.3546	-0.0687	1			
debt_service	0.2716	-0.2042	0.1788	1		
Popgr	-0.0704	0.0326	0.0155	0.0175	1	
icrg_gov_stab	-0.3833	0.0946	-0.0336	-0.4057	0.0004	1

Correlation between explanatory variables of "inflation"

	lnrem	m2gdpgr	gdpgr	dpinterest	exchange	icrg_low_ord	icrg_inv_prfl
lnrem	1						
m2gdpgr	-0.0733	1					
gdpgr	0.0265	-0.1082	1				
dpinterest	0.3292	-0.1119	-0.0894	1			
exchange	-0.0714	0.0352	0.037	-0.0245	1		
icrg_law_ord	-0.1869	0.0452	0.1428	-0.1015	0.0269	1	
icrg_inv_prfl	-0.3465	0.1055	0.0998	-0.1551	-0.0715	0.4749	1

Appendix D: Multi-Collinearity Test (VIF)

Multi-collinearity between explanatory variables of "composite risk"

Variable	**VIF**	**1/VIF**
lnrem	1.52	0.658401
debt_service	1.37	0.731071
icrg_gov_stab	1.35	0.743453
govconexpgdp	1.28	0.782526
Gdpgr	1.07	0.932816
Popgr	1.01	0.990169
Mean VIF	1.27	

Multi-coliniarity between explanatory variables of "Interest rate"

Variable	VIF	1/VIF
inflcpi	1.33	0.751171
lnrem	1.31	0.763297
icrg_inv_prfl	1.17	0.857324
gdpcapgr	1.13	0.885753
gfgdpgr	1.07	0.936440
exchange	1.06	0.945320
icrg_corrupt	1.06	0.947134
Mean VIF	1.16	

Multi-collinearity between explanatory variables of "inflation"

Variable	**VIF**	**1/VIF**
icrg_inv_prfl	1.46	0.685416
icrg_law_ord	1.31	0.762414
Lnrem	1.27	0.785142
Dpinterest	1.15	0.871326
Gdpgr	1.05	0.949156
m2gdpgr	1.04	0.961149
Exchange	1.03	0.97487
Mean VIF	1.19	

Appendix E: Granger causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
INTEREST RATE does not Granger Cause REMITTANCES	206	3.96844	0.0204
REMITTANCES does not Granger Cause INTEREST RATE		14.4870	1.E-06
CREDGDPDF2 does not Granger Cause REMITTANCES	247	0.08297	0.9204
REMITTANCES does not Granger Cause FINANCIAL DEVELOPMENT		0.37639	0.6867
GDP GROWTH does not Granger Cause REMITTANCES	261	4.47054	0.0123
REMITTANCES does not Granger Cause GDP GROWTH		0.49969	0.6073
INVESTMENT does not Granger Cause REMITTANCES	245	1.17596	0.3103
REMITTANCES does not Granger Cause INVESTMENT		0.18732	0.8293
COMPOSITE RISK does not Granger Cause REMITTANCES	249	3.89477	0.0216
REMITTANCES does not Granger Cause COMPOSITE RISK		3.84416	0.0227
INFLATION does not Granger Cause REMITTANCES	261	11.9322	1.E-05
REMITTANCES does not Granger Cause INFLATION		55.3559	1.E-20
FINANCIAL OPENNESS does not Granger Cause REMITTANCES	255	0.45674	0.6339
REMITTANCES does not Granger Cause FINANCIAL OPENNESS		1.26987	0.2827
EXCHANGE RATE does not Granger Cause REMITTANCES	258	0.86039	0.4242
REMITTANCES does not Granger Cause EXCHANGE RATE		0.19521	0.8228
HUMAN CAPITAL does not Granger Cause REMITTANCES	84	0.86304	0.4258
REMITTANCES does not Granger Cause HUMAN CAPITAL		2.24203	0.1130
TRADE does not Granger Cause REMITTANCES	254	3.10316	0.0466
REMITTANCES does not Granger Cause TRADE		2.91182	0.0562