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Remittances and the real effective exchange rates in MENA countries: What is the long run impact?

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JEL Codes: F22, F24, F31

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Abstract

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Introduction

Over the past years, the analysis of the effects of remittances made by migrant workers towards their home countries has yield a great interest among researchers in economy, sociology and political science (Adams, 2011; Gubert, 2005)[1]. Indeed, these remittances constitute a considerable source of enrichment for developing countries. In the MENA region, the amounts of remittances widely exceeded, in the last decade, any other types of currency inflows, such as foreign direct investment or official development assistance. According to the World Bank (2015), remittances toward the region rose to $50.3 billion in 2015. Even if there has been a slight collapse, with only 0.9 % of increase compared with the previous year, these remain massive flows at the scale of the region. In North Africa, Morocco ($6.4 billion) is, far ahead of Egypt ($2.35 billion), the biggest beneficiary. As for the Middle East, Jordan witnessed $5.4 billion of currency remittances and Yemen recorded $3.4 billion. This means that, within the MENA region, these flows are very variable among countries. Also, their amount and evolution in time differ. This is because internal elements interfere at the level of every country. Natural resources vary, the populations are not identical, nor the institutional and social structures, let alone the degree of economic liberalization. That is why the remittances also have different consequences depending on each country's exchange rate regime (Lahrèche-Revil, 1999). Similarly, the countries authorities' choice of one exchange rate regime or another is not exempt from the consideration of these currency inflows (Singer, 2010). However, if the latter are much more constant than the other private flows and if, in other countries, they relate to a counter-cyclical approach (Buch & Kuckulenz, 2010; Nayyar, 1994; Ratha, 2003), they are always likely to produce adverse

[1] « Remittances » or « sendings of funds » are established by the monetary sums and the goods that the national as well as international migrants send to the households or to the groups from which they originate (Lachaud, 1999).

effects locally. One such effect is a rise in imports, leading to a further worsening of the balance of trade deficit. Another pitfall may relate to the systems based on a non-convertible currency, mainly in an inflationary context. Therefore, holding a foreign currency can lead to dollarization, appearance or even the surge of the parallel exchange market. Nevertheless, the intensity of remittances has ineluctably a positive influence on curbing poverty and on the growth rate of the home countries (Acosta, Lartey, & Mandelman, 2009; Adams & Page, 2005), yet researchers have raised one difficulty: the more important the remittances, the more appreciated the real exchange rate (Amuedo-Dorantes & Pozo, 2004; Bourdet & Falck, 2006; Vargas-Silva, 2009). This appreciation of the real exchange rate could lead to a loss of competitiveness of exportable goods, which would be followed by a decline in the production of many manufactured goods, a depression, a rise in unemployment and the end of the decline in poverty. Yet, such prospects would mainly apply to small countries (Kapur, 2005). Identified as the *Dutch disease*, this phenomenon was first analyzed by Corden (1984) and Corden and Neary (1982). However, figure 1 shows that this seems not to be the case for the MENA countries. There is indeed a negative relationship between remittances and the real effective exchange rate in most countries in the region.

Therefore, the objective of this paper is to analyze, for the MENA region, the impact of remittances on the real effective exchange rate. Notwithstanding the economic weight they represent in the home countries, we intend to analyze to what extent these remittances unbalance the exchange rate. Unlike many studies that show that remittances lead to an appreciation of the real effective exchange rate[2] (Chnaina & Makhlouf, 2015; Lartey, Mandelman, & Acosta, 2012), we put forward a hypothesis, that of the absence of The *Dutch disease* in the different MENA countries. To verify this hypothesis, we relied on an estimation strategy which consists in sequentially comparing the real exchange rate's sensitivity to inflow of capital sent by migrants into the Middle East and North Africa countries. Considering that countries do not have the same exchange rate policies (more or less flexible exchanges managed) nor the same degree of trade openness, we based our estimation strategy on three assumptions: heterogeneity in short-run and homogeneity in long-run, pure heterogeneity in both short run and long run, and cross-sectional dependence of countries in short run and long run.

The article is organized as follows: section 2 presents a theoretical view of the transmission channels of remittances on the real exchange effective, while section 3 reviews the literature on the relationship between the remittances and the real effective exchange rate. Section 4 discusses the methodology used; and the econometric results are presented by section 5. Section 6 concludes and gives political recommendations.

Transmission channels of remittances on real exchange rate: a theoretical view

In the short run

As highlighted by previous studies, the impact of remittances on the real exchange rate undergoes many factors and may impact both short run and long run equilibrium. The theoretical considerations of Lopez and al. (2007) describe the former. First, since international remittances are perceived as transfers of foreign currency that, unlike other types, have no obligations associated, their effect on real exchange rate directly passes through a rise of the country's net foreign asset position (Lopez & al., 2007). Second, remittances may induce an increase of demand for nontraded goods resulting in a rise of the price of non-traded goods relative to the price of traded goods. This effect leads to an appreciation of the real exchange rate (Amuedo-Dorantes & Pozo, 2004; Lopez & al., 2007). Finally, in the short run, the effect of remittances on real exchange rate can be through their impact on growth. Lopez and al. (2007) argued that this effect might lead both to an appreciation or depreciation. Growth rate acceleration would lower the stock of net foreign assets as percentage of GDP leading to a depreciation of a real exchange rate. However, if the net foreign asset position is negative *vis a vis* the rest of the world, growth rate increase would lower the liabilities to GDP ratio leading to an appreciation. Following Amuedo-Dorantes and Pozo

[2] An increase in REER implies that exports become more expensive and imports become cheaper; therefore, an increase indicates a loss in trade competitiveness.

(2004), let q denote the real exchange rate, W symbolize international transfers, and X stand for a vector of control variables that are the others determinants of the real exchange rate.

$$q = f_{SR}(\mathrm{W}^{+/-}, X)$$

With the sign (+) indicating an appreciation while (-) means a depreciation. The vector of control variables X includes differential technological progress, α_{diff}, government expenditure, G , the external terms of trade, TOT, the foreign interest rate, R_w, foreign aid, ODA (Amuedo-Dorantes & Pozo, 2004); and per capita GDP, y, the net international investment position, NFA, the fertility rate, F, the black market premium, $Black$, Administered agricultural price, p_a, natural disaster, ND (Barajas & al., 2010). The vector X can be summarized as:

$$X = (\alpha_{diff}, G, TOT, R_w, ODA, y, NFA, F, Black, p_a, ND)$$

In the long run

In the long run, the impact of remittances on exchange rate is uncertain since it can be small, muted or depreciated. According to Barajas and al. (2010), in highly open economies with flexible labor markets in which the traded and nontraded goods sectors employ similar factors which can be readily reallocated between the two sectors with minimal frictions, the impact of remittance flows on the equilibrium real exchange rate will tend to be small. They also argued that if remittance receipts are only partly autonomous, so that such receipts are partially driven by changes in domestic real income in countercyclical fashion, the effects of an exogenous increase in remittance receipts on the long-run equilibrium real exchange rate will tend to be muted. Barajas & al. (2010) also highlighted that, in a case of a reduction of the risk premium of a country as a result of a reception of remittances, the reduced cost of international borrowing in response to larger remittance inflows will induce the country to reduce its international net investment position in the long run, and the reduced net interest receipts induced by the deterioration in the net investment position would tend to offset the effects of the remittance receipts on the equilibrium real exchange rate. Finally, when remittances are fully devoted to traded goods, they will have no effect on the long-run equilibrium real exchange rate in a nonmonetary economy while in a monetary economy their impact could be depreciation (Barajas & al., 2010). Given such considerations, equation 1 becomes:

$$q = \alpha f_{SR}(\mathrm{W}^{+/-}, X) + \beta f_{LR}(W^{-}, X)$$

When $\beta = 0$, there is no long-run impact of remittances on the real exchange rate.

Literature review

It is an antiphon of the economic literature: the migrants' remittances towards their home countries have very different consequences on the real effective exchange rate. They stem as much from the intensity of trade exchanges as from the size of these same countries (Barajas & al., 2010). As a result, some countries face a depreciation of their currency due to the influx of foreign currency, while others experience an appreciation of their exchange rate. If this foreign currency influx leads to an increase in the demand for imported goods at the detriment of domestic production, the real effective exchange rate can be appreciated (Barajas & al., 2010; Grabel, 2008). This currency appreciation may result in a decline in the competitiveness of the domestic firms, both internationally and domestically (Amuedo-Dorantes & Pozo, 2004; Bourdet & Falck, 2006; Hinkle & Montiel 1999; Izquierdo & Montiel, 2006; Singer, 2010). Also, this can result in transfers of resources from traded goods to non-traded ones: this is what we refer to as the *Dutch disease* (Bourdet & Falck, 2006; Lartey & al., 2012; Mughal & Makhlouf, 2013). Such a phenomenon can only have a negative effect on the balance of payments and the labor market, which in turns leads to a surge in unemployment and, consequently, to a new wave of migration. Thus, several econometric studies have focused on the precise assessment of the impact of migrants' remittances on their home countries' real effective exchange rate. Three groups of results can be identified.

Firstly, a profusion of studies asses the direct link between the increase in remittances and the real effective exchange rate appreciation. Focusing on one country, the first study was carried

out by Bourdet and Falck (2006). Their review of the workers' remittances in Cape Verde during the period 1980-2000 confirmed the phenomenon of real exchange rate appreciation due to an increase in remittances. Similar results were also recorded about Pakistan for the period 1978-2005 (Hyder & Mahboob, 2006) and Jordan for the period 1964-2005 (Saadi-Sedik & Petri, 2006). As for Chnaina & Makhlouf (2015), they have drawn similar conclusions about Tunisia for the period 1975-2009.

Amuedo-Dorantes and Pozo (2004) carried out a first study on 13 countries in Latin America and the Caribbean during the period 1978-98. They showed that a doubling of remittances had resulted in a 22% increase in the real exchange rate. Using wider samples from different regions, other studies (Fuentes & Herrera, 2008; Holzner, 2006; Lopez et al., 2007[3]) have revealed the same trend, but with a lower quantitative impact of remittances flows on the real exchange rate than in the Amuedo-Dorantes and Pozo (2004) study.

Secondly, other studies have shown that remittances led to a depreciation of the real effective exchange rate (Li & Rowe, 2007; Özcan, 2011). For instance, in Jamaica, Barrett (2014) proved that remittances caused depreciation of the real exchange rate with a model that integrates public expenditure, official development assistance and the terms of trade. In a study focusing on the impact of development aid, Li and Rowe (2007) reached a similar conclusion about Tanzania. Contrary to the *Dutch disease* theory, such results would reflect the financial development of the sampled countries, as they would not be able to harness remittances to investments in the non-tradable sector. It is to be noted that the *Dutch disease* theory was first framed for developed countries, namely since the discovery of gas in the Netherlands in the 1950s. The intensive exploitation and exportation of the country's natural resources increased export earnings, which in turn led to an appreciation of the country's currency. This hindered exporting other products, leading to a decline in the manufacturing output. Economists would lately recognize the relevance of this phenomenon also for developing countries. Yet, real disparities have surged between these two types of countries. Such disparities were partly due to the specificities of the different exchange rate regimes (Krugman, 2009; Vargas-Silva, 2009). Barajas and al. (2010) have also shown that the *Dutch disease* risks were lessened, if not reversed, according to many important factors, such as the degree of international openness, factors´ mobility between national sectors, remittances´ counter-cyclicality, share of consumption in the tradable goods and country's sensitivity towards remittances risk premium.

It should also be noted that the empirical literature on the impact of official development assistance on the exchange rate presents diverse results. Elbadawi (1999), in a study of 62 developing countries, 28 of which being from Africa, found that unsustainable aid flows have led to a partial overvaluation of the partial real exchange rate in many African and non-African countries. In addition, African countries that rely on exceptionally high aid have experienced an overall real overvaluation. An earlier study by White and Wignaraja (1992) found that aid inflows were associated with the appreciation of the real exchange rate. In a recent study, Ouattara and Strobl (2008) also found support for the *Dutch Disease* hypothesis for Ghana.

Finally, several studies have attempted to prove the non-existence of this link between migrants' remittances and the real equilibrium exchange rates (Rajan & Subramanian, 2005; Vargas-Silva, 2009)[4]. Ogun (1998) for Nigeria, Nyoni (1998) for Tanzania, and Sackey (2001) for Ghana found no evidence of the *Dutch Disease.* Izquierdo and Montiel (2006), for six Central American countries during the period 1960-2004, found no impact of remittances on the equilibrium real exchange rate in the cases of Honduras, Jamaica and Nicaragua. Not only the influence was null over the whole period, but it also has not been greater over the last few years, even though these three countries were receiving very large inflows. More recently, using the Pool Mean Group method, Mongardini and Rayner (2009) analyzed the common long-run determinants of the real exchange rate for 29 sub-Saharan African countries over the 1980-2006 period, while allowing a heterogeneous short-term dynamics between countries. And their results show that remittances do not cause any

[3] For a panel of 13 Latin American countries between 1990 and 2003, a 10% rise in remittances increases the REER by 2.2%.

[4] Vargas-Silva (2007) also finds that the effects of remittances on the REER remain ambiguous for Mexico.

appreciation of the real effective exchange rate.

Econometric strategy

The aim of our paper is to assess the effect of remittances on real effective exchange rate in MENA countries from 1980 to 2015. Following the theoretical framework, let us assume that the relationship between remittances and real effective exchange rate follows an autoregressive distributive lag (ARDL) model described as:

$$REER_{i,t} = \alpha_i + \theta_i REER_{i,t-1} + \beta_{1,i} Remit_{i,t} + \beta_{2,i} X_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $REER_{it}$ is the Real Effective Exchange Rate for a country i at a time t; $Remit_{it}$ is the received remittances in a country i at a time t; X_{it} is a set of control variables. One of the key features of dynamic models is that they allow the estimation of long-run and short-run relationships among variables. Let equation (1) be transformed into an error correction model such that the long-run and short-run dynamic effect of remittances on real effective exchange rate can be estimated with the following equation:

$$\Delta REER_{it} = \emptyset_i \left(REER_{i,t-1} - \beta_{1,i} Remit_{i,t-1} - \beta_{2,i} X_{i,t-1}\right) + \delta_{0,i} + \delta_{1,i} \Delta Remit_{it} + \delta_{2,i} \Delta X_{it} + \varepsilon_{i,t} \quad (2)$$

Where $\emptyset_i$ is the error-correction term or adjustment parameter; $\beta_{1,i}$ and $\beta_{2,i}$ are the long-run parameters; and $\delta_{1,i}$ is a vector representing the short-run parameter. $\emptyset_i$ is expected to be negative and significantly different from zero.

To estimate the parameters of equation (2), we use the pooled mean group estimators of Pesaran & al. (1999) which allow the intercept, the short-run coefficients and the error variances to differ across the groups but constrain the long-run coefficients to be equal across groups. Indeed, since our analysis is based on a large number of years (>15) and since we are studying a dynamic case, fixed- or random-effects' estimators which assume homogeneity of parameters produce inconsistent estimates of the parameters (Pesaran & Smith, 1995). In addition, although the mean group estimator proposed by Pesaran and Smith (1995) yields consistent estimates of the parameters, it does not take into account the fact that certain parameters may be the same across a group (Pesaran & al., 1999). The pooled mean group estimator (Pesaran & al., 1999) is more appropriate to account for both homogeneity and heterogeneity of slope parameters because it is an intermediate between a pure pooled estimation (with homogeneous coefficients) and a mean group estimation (with heterogeneous coefficients).

Pesaran & al. (1999) have provided the estimator for the case of stationary and nonstationary regressors. However, their estimator allows the nonstationary regressors to only be integrated of order 1. Consequently, we start the analysis by conducting unit root tests in order to exclude I(2) variables in the estimations. We adopt the tests of Levin & al. (2002), Im & al. (2003) and Pesaran (2007), which respectively take into account homogeneity, heterogeneity and dependence across units. All the tests show that our variables are either stationary or integrated of order 1 (Table 2), implying that we can estimate equation (2) with the pooled mean group estimator. In addition to these tests, we also performed the unit root test of Zivot & Andrews (1992) for our dependent variable, the real effective exchange rate. The test accounts for the presence of structural break due to shocks and allows the estimation of endogenous breakpoints for each country. The result from table 3 indicates that, except for Syria for which the real effective exchange rate is stationary, it is *I (1)* for Algeria, Egypt, Jordan, Iran, Oman and Tunisia, and *I (2)* for Morocco and Yemen. Since the panel unit root tests are more powerful than univariate ones, we considered that the real effective exchange rate is integrated of order 1 as indicated by the tests of Levin & al. (2002), Im & al. (2003) and Pesaran (2007). However, to take into account structural breaks that may affect the upshot of the pooled mean group estimators, exogenous dummies of the breakpoints obtained with Zivot & Andrews (1992) test were included in the explanatory variables before the estimations.

Data used to estimate equation 2 corresponds to 9 countries of MENA region between 1980 and 2015. These countries are composed of 5 Middle East countries (Jordan, Iran, Oman, Syria and Yemen), and 4 countries from North Africa (Algeria, Egypt, Morocco and Tunisia). The data was collected from different sources as described in Table 10. Regarding data on the Real Effective Exchange Rate (REER), they are derived from the

International Monetary Fund. Except the Data on the labor productivity, which was collected from the Conference Board for International Labor comparisons' database, the other macroeconomics variables were obtained from the World Development Indicators (WDI) database of the World Bank.

Table 1 indicates the descriptive statistics of the variables in the overall considered countries in MENA as well as those in the sub-regions. It shows that remittances as well as official development assistance are mostly received in the Middle East than in North Africa. However, North Africa is a better FDI-receiver than the Middle East.

Results

Table 4 presents the results of estimating the impact of remittances on the real effective exchange rate in the MENA region, while the other two (tables 5 and 6) correspond to North Africa and the Middle East, the two MENA subgroups. The question, therefore, is to know whether there are any differences between the subgroups, but also to validate the results obtained when we considered all the countries of the MENA region.

The coefficient of convergence towards long-term equilibrium is significant and negative in the three cases ($\theta i = -0.11$). Based on the Pooled Mean Group estimation (PMG), this result allows us to confirm the existence of a long-term relationship between the REER and its fundamental determinants for all countries in the region.

However, the spring force is lower for the North African countries ($\theta i = -0.05$) than for those of the Middle East ($\theta i = -0.24$). This means that the non-linear adjustment towards a long-term equilibrium exchange rate model is slower in North Africa than in the Middle East. The weight of rigidities in the market for non-tradable goods can account for such a slow adjustment, but also plays the role of monetary interventions aiming at stabilizing the exchange-rate parities (Bouoiyour, Marimoutou, & Rey, 2004).

Between the MENA region and its two subareas, there are obviously common trends but also some differences. For instance, as far as the fundamental variables of the real effective exchange rate are considered, it seems that on the long-term they are statistically significant for the MENA region, except for the trade and the net foreign assets. However, net foreign assets have a negative and significant effect in the Middle East.

On the long-term, migrants' remittances towards the whole MENA countries negatively affect the REER. And this is statistically confirmed for the North African countries and also for those of the Middle East. Table 4 shows that a 1% growth in the remittances to GDP ratio towards the MENA countries leads to drop off (-3.97%) in the real effective exchange rate. Yet, this impact is bigger for the North African countries (- 5.59%) compared to those of the Middle East (-4.04%). On the other hand, and on the short term, remittances do not have any statistically significant impact on the real effective exchange rate in the Middle East countries, while they lead to its depreciation in the North African countries. In other words, the *Dutch Disease* risk is unlikely to be verified for the MENA countries as a whole. On the long-term, the increase in remittances does not hurt price competitivity in this case. Indeed, when the market of non-tradable goods becomes more competitive, the production of non-tradable goods is boosted. This leads to a rise in the prices of tradable goods, and hence a depreciation of the REER (Benigno & Thoenissen, 2003).

Unlike migrants' remittances, official development assistance, in the form of net foreign exchange inflows, leads indeed to a rise in the REER on the long-term but this effect exists only in the Middle East. Such a result, thus, confirms the existence of the *Dutch disease* risk for Middle East countries. Accordingly, foreign direct investment exerts an effect of appreciation on the real effective exchange rate, but this effect is only significant in North Africa. Indeed, the inflow of capital flows leads to a *Dutch disease* risk. This can be explained by an increase of the non-tradable goods and a move towards less productive and less exportable goods and services; which negatively affects price competitivity (Comunale, 2017).

If the increase in productivity has a tendency to appreciate the real effective exchange rate in the MENA region, there is still a difference between the two subareas. This can be accounted for by the existence of the *Balassa-Samuelson* catch-up process in the North African countries, a common

phenomenon in the developing economies. Yet, the contrary is true in the Middle East countries.

As shown in table 5, the increase in productivity is linked to an appreciation of the real effective exchange rate for the North African countries. This can be explained by the fact that the productivity increase in the non-tradable goods sector tends to reduce the price of home production compared to the foreign one, which leads to an overall depreciation of the REER (Benigno & Thoenissen, 2003). This *Balassa-Samuelson* effect, which links the REER appreciation to productivity increase in the tradable goods sector (Macdonald & Ricci, 2005), is verified for the North African countries. We observe the opposite effect for the Middle East countries. As stipulated by Benigno and Thoenissen (2003), the productivity increase in the non-tradable goods sector tends to lower the price of home production compared to the foreign one, which leads to an overall depreciation of the real effective exchange rate.

When we consider the MENA region as a whole, public expenditure leads to an appreciation of the REER on the long-term. This can be achieved by allocating such expenditure to non-tradable goods. Indeed, when public expenditure is oriented to the consumption of non-tradable goods, their relative prices increase leading to an appreciation of the REER (Amuedo-Dorantes & Pozo, 2004; Barajas et al., 2010; Froot & Rogoff, 1995).

The overall tendency observed for the MENA region as a whole unveils particular characteristics. If we split the region into two subgroups, we find, for instance, that the effect of public expenditure is significant only for the Middle East countries.

Unlike public expenditure, trade openness has a negative and significant effect, on the long-term, on the REER for the Middle East countries (table 6). It is theoretically known that trade openness exerts a controversial effect on the real effective exchange rate on the long term (Lartey & al., 2012). Depending on the income effect, the increase in import tariffs leads to a fall in income which in turn leads to a fall in the non-tradable goods' demand, hence a fall in their prices and a depreciation of the REER. Conversely, thanks to the substitution effect, this increase entails higher prices for imported goods, which urges a demand transfer towards the sector of non-tradable goods. This leads to a rise in the price of non-tradable goods with, for backlash, an appreciation of the REER (Lartey & al., 2012). The substitution effect seems to outweigh the income effect in the Middle East countries. In those of North Africa, this impact is not significant (Table 5).

Robustness

In order to verify the robustness of our results, we also estimated the impact of remittances by the Mean Group estimator of Pesaran and Smith (1995), which assumes heterogeneity of countries both in long and short-run. The results in tables 7, 8 and 9 indicate that, even assuming a pure heterogeneity of countries, remittances have a depreciation effect on real effective exchange rate in MENA countries.

To control for a sectional dependence between countries which may arise when a set of additional covariates are affected by the same set of unobserved common factors, we used the dynamics common correlated effects estimator suggested by Chudik and Pesaran (2015). If the cross sectional means are not included in the equation or do not account for all dependence between units, the error term will contain cross sectional dependence and will not be i.i.d as assumed in the Pooled mean group estimator of Pesaran & al. (1999). As argued by Chudik and Pesaran (2015), it is difficult to find economic time series that do not share one or more common factors. However, to assure the existence of common factors in our data, we computed the cross sectional dependence test proposed by Pesaran (2015). The test rejected the null hypothesis of weak cross sectional dependence, meaning that equation (1) should be also estimated with the dynamics common correlated effects estimator to check the robustness of the pooled mean group results.

Table 7, 8 and 9 show the results of the dynamic common correlated effect estimator for respectively the overall MENA countries, the Middle East countries and the North African countries. In all cases, even considering cross-sectional dependence, remittances have a depreciation effect on the real effective exchange rate. The results obtained with the pooled mean group are then robust to the presence of cross-sectional dependence.

Conclusion

Many studies have already highlighted the positive role of migrant remittances in reducing poverty in low-income recipient countries (Adams & Page, 2005), including those in North Africa (Adams, 1991; Margolis & al., 2015).

However, remittances, which can be seen as the inflow of foreign currency in developing countries, may induce the appreciation of the REER. This appreciation can lead to a loss of competitiveness of a country vis-à-vis its main partners. This effect on competitiveness imposes a significant economic cost on exports in recipient countries. This mechanism has been recognized as Dutch Disease.

However, several important factors may weaken or even eliminate the risks of Dutch Disease. These factors include the degree of international openness, factor mobility between sectors, the counter-cyclicality of remittances, the share of consumption in tradable goods and the sensitivity of risk premiums (Barajas & al., 2010).

The hypothesis of this paper was based on the non-existence of the risk of Dutch Disease in the MENA region. Our thesis is based on Figure 1, which shows a negative trend between the REER and remittances trend for most countries. This assumption has been confirmed by estimates of the long-run relationship between both variables. Indeed, unlike existing studies, we found that remittances have a depreciation effect on the REER in the long-run in the MENA countries. This was confirmed when the same estimation was performed for the two major subgroups in the region, North Africa and Middle East. Thus, the increase in remittances does not deteriorate the price competitiveness of the recipient countries in the long-run. There are many reasons for this. On the one hand, the overvalued exchange rate policy pursued by public authorities leads to a reversal of the relationship between remittances and the REER. In addition, the significant use of remittances in tradable goods can also be the cause of the depreciation of the REER in the MENA countries. Finally, when remittances are contra-cyclical, this tends to lower public consumption, leading to a depreciation of the REER in the long-run.

Our analysis also shows that, unlike migrant remittances, foreign direct investment and official development assistance have an appreciation effect on the REER. In other words, there is a risk of Dutch Disease in the MENA region, but caused by development aid and foreign direct investment.

Our results complete those of previous macroeconomic studies that examine the relationship between the REER and its underlying determinants in the MENA region, particularly in the two subgroups of the region.

The main contribution of our paper was to highlight the positive impact of remittances on the REER in the MENA region while taking into account control variables.

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Appendix

Table 1: Descriptive Statistics

		Overall MENA			Middle East			North Africa		
Variable		Mean	Std. Dev.	Observations	Mean	Std. Dev.	Observations	Mean	Std. Dev.	Observations
REER	overall	140.757	71.024	N = 324	140.89	69.985	N = 180	140.584	72.547	N = 144
	between		28.599	n = 9		25.638	n = 5		36.120	n = 4
	within		65.690	T = 36		66.100	T = 36		65.404	T = 36
Remittances (% of GDP)	overall	5.5	6.5	N = 324	6.1	8.3	N = 180	4.7	2.9	N = 144
	between		5.8	n = 9		7.8	n = 5		2.7	n = 4
	within		3.5	T = 36		4.5	T = 36		1.8	T = 36
FDI (% of GDP)	overall	1.6	3.4	N = 324	1.5	4.3	N = 180	1.7	1.7	N = 144
	between		1.3	n = 9		1.7	n = 5		0.9	n = 4
	within		3.2	T = 36		4.0	T = 36		1.5	T = 36
ODA (% of GDP)	overall	2.6	4.3	N = 324	3.1	5.4	N = 180	1.9	2.2	N = 144
	between		2.9	n = 9		3.8	n = 5		1.3	n = 4
	within		3.4	T = 36		4.2	T = 36		1.9	T = 36
NFA (% of GDP)	overall	29.9	56.3	N = 324	41.8	70.2	N = 180	15.0	24.2	N = 144
	between		25.9	n = 9		29.6	n = 5		10.1	n = 4
	within		50.7	T = 36		65.0	T = 36		22.6	T = 36
Gov. Expenditure (% of GDP)	overall	1.69	6.8	N = 324	1.77	8.7	N = 180	1.59	2.7	N = 144
	between		4.1	n = 9		5.4	n = 5		2.2	n = 4
	within		5.5	T = 36		7.2	T = 36		1.9	T = 36
Trade (% of GDP)	overall	71.180	27.054	N = 324	76.309	31.465	N = 180	64.7702	18.424	N = 144
	between		25.020	n = 9		31.147	n = 5		16.649	n = 4
	within		13.181	T = 36		14.477	T = 36		11.406	T = 36
Net barter terms of trade	overall	123.01	44.075	N = 324	126.06	43.608	N = 180	119.1943	44.509	N = 144
	between		21.386	n = 9		24.943	n = 5		18.847	n = 4
	within		39.176	T = 36		37.432	T = 36		41.386	T = 36
Productivity	overall	43965.96	29243.08	N = 324	51125.5	35209.67	N = 180	35016.52	15316.26	N = 144
	between		30253.17	n = 9		38467.81	n = 5		16595.98	n = 4
	within		6251.376	T = 36		7020.625	T = 36		5154.929	T = 36

Sources: Authors.

Table 2: Unit root tests

	Levin-Lin-Chu			Im-Pesaran-Shin			Pesaran's CADF		
	Level	First difference	C	Level	First difference	C	Level	First difference	C
REER (log)	-1.2062	-5.2960***	I(1)	-1.3663*	-7.6861***	I(1)	-0.532	-7.106***	I(1)
Remittances (% GDP)	-2.2772**		I(0)	-3.9946***		I(0)	-4.103***		I(0)
FDI (% GDP)	-2.6956***		I(0)	-5.5079***		I(0)	-5.547***		I(0)
ODA (% GDP)	-3.2725***		I(0)	-5.1624***		I(0)	-3.813***		I(0)
NFA (% GDP)	-0.2668	-4.1228***	I(1)	-2.3085**		I(0)	1.354	-4.234***	I(1)
Productivity (log)	0.2868	-2.7304***	I(1)	-1.4263*	-9.5452***	I(1)	-2.303**		I(0)
Trade (log)	-3.0054***		I(0)	-4.9356***		I(0)	-2.010**		I(0)
Openness (% GDP)	-2.7159***		I(0)	-3.3228***		I(0)	-1.196	-6.980***	I(1)
Public expenditure (% GDP)	-3.1718***		I(0)	-4.1691***		I(0)	-3.318***		I(0)

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***).

Table 3: Unit root tests with break

REER (log)	Breaks	Lag selection via BIC	t-statistic	C
Algeria	1990	1	-4.596***	I(1)
Egypt	1990	1	-5.145***	I(1)
Jordan	1987	1	-3.641***	I(1)
Iran	1990	1	-3.983***	I(1)
Morocco	1993	2	-5.048***	I(2)
Oman	1986	1	-3.840***	I(1)
Syria	1992	0	-4.388***	I(0)
Tunisia	1986	1	-3.871***	I(1)
Yemen	1998	2	-6.279***	I(2)

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***).

Tableau 4: Pooled mean group estimators for overall MENA

Dependent variable : Real effective exchange rate (log)				
	(1)	(2)	(3)	(4)
Remittances (% of GDP)	-5.756***	-3.309**	-3.642**	-7.930***
	(1.88)	(1.453)	(1.554)	(2.403)
Log(Productivity)	2.070 ***	2.007***	1.897***	2.265***
	(0.536)	(0.571)	(0.472)	(0.649)
Log(Trade)		0.331	0.267	-0.184
		(0.251)	(0.249)	(0.285)
NFA (% of GDP)	-0.110	-0.086	-0.108	
	(0.096)	(0.104)	(0.100)	
Openness (% of GDP)	-0.010***	-0.015***	-0.013***	-0.012***
	(0.003)	(0.004)	(0.003)	(0.004)
FDI (% of GDP)			2.759*	5.653**
			(1.679)	(2.815)
ODA (% of GDP)	2.614		3.317**	4.503**
	(1.932)		(1.512)	(2.210)
Public expenditure (% of GDP)	2.980**	3.185**		3.865**
	(1.337)	(1.425)		(1.667)
Error Correction	-0.105**	-0.116*	-0.110*	-0.097**
	(0.0735)	(0.064)	(0.062)	(0.048)
D.Remittances (% of GDP)	12.396	10.163	8.768	9.660
	(14.073)	(13.164)	(11.464)	(12.025)
D.Log(Productivity)	-0.287	-0.196	-0.351	-0.542
	(0.302)	(0.264)	(0.291)	(0.360)
D.Log(Trade)		-0.118*	-0.109	-0.113
		(0.068)	(0.066)	(0.082)
D.NFA (% of GDP)	-0.149	-0.125	-0.136	
	(0.116)	(0.091)	(0.134)	
D.Openness (% of GDP)	-0.0002	-0.001	-0.001	-0.0002
	(0.002)	(0.002)	(0.002)	(0.002)
D.FDI (% of GDP)			-1.971	-1.772
			(2.149)	(1.895)
D.ODA (% of GDP)	-18.463		-16.335	-22.982
	(16.155)		(15.951)	(21.336)
D.Public expenditure (% of GDP)	-0.408	-0.082		0.139
	(0.373)	(0.297)		(0.485)
Dummy	-0.123**	-0.136**	-0.102**	-0.065
	(0.060)	(0.055)	(0.047)	(0.088)
Constant	-1.634**	-1.893*	-1.593*	-1.611**
	(0.790)	(1.017)	(0.881)	(0.784)
Number of observations	315	315	315	315
Number of groups	9	9	9	9
Observations per group (T)	35	35	35	35
Log Likelihood	376.641	378.062	388.742	388.023

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***).

Tableau 5: Pooled mean group estimators for North Africa

Dependent variable : Real effective exchange rate (log)				
	(1)	(2)	(3)	(4)
Remittances (% of GDP)	-5.916***	-5.953**	-9.255***	-11.181***
	(2.236)	(2.357)	(3.507)	(4.699)
Log(Productivity)	0.876**	1.537***	1.624***	1.906**
	(0.408)	(0.502)	(0.598)	(0.871)
Log(Trade)	0.074	-0.229	-0.309	-0.454
	(0.307)	(0.306)	(0.371)	(0.514)
Public expenditure (% of GDP)	-1.733		-2.261	-2.086
	(2.551)		(2.631)	(3.507)
Openness (% of GDP)		-0.002	-0.004	-0.007
		(0.003)	(0.004)	(0.006)
ODA (% of GDP)		2.955	2.007	
		(1.980)	(2.323)	
FDI (% of GDP)			6.928	9.996*
			(4.233)	(5.969)
Error Correction	-0.074**	-0.057*	-0.046*	-0.035*
	(0.031)	(0.031)	(0.026)	(0.021)
D. Remittances (% of GDP)	-3.117	-2.579	-2.798	-2.729
	(2.065)	(1.825)	(2.148)	(2.065)
D. Log(Productivity)	0.229	0.136	0.007	0.058
	(0.440)	(0.328)	(0.269)	(0.301)
D. Log(Trade)	-0.260	-0.132	-0.130	-0.124
	(0.207)	(0.170)	(0.187)	(0.182)
D. Public expenditure (% of GDP)	0.523		0.926	0.837
	(1.191)		(0.553)	(0.524)
D. Openness (% of GDP)		-0.006	-0.006*	-0.006
		(0.004)	(0.003)	(0.003)
D. ODA (% of GDP)		0.854	2.180	
		(2.215)	(3.490)	
D. FDI (% of GDP)			-0.448	0.026
			(1.234)	(0.901)
Dummy	-1.449*	-0.149**	-0.133**	-0.167**
	(0.084)	(0.065)	(0.055)	(0.082)
Constant	-0.304***	-0.549**	-0.435**	-0.409*
	(0.113)	(0.272)	(0.224)	(0.217)
Number of observations	140	140	140	140
Number of groups	4	4	4	4
Log Likelihood	236.655	250.809	256.179	250.658

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***).

Tableau 6: Pooled mean group estimators for Middle East

Dependent variable : Real effective exchange rate (log)				
	(1)	(2)	(3)	(4)
Remittances (% of GDP)	-7.036***	-6.335***	-13.233**	-8.084***
	(2.045)	(1.62)	(5.740)	(2.591)
Log(Productivity)	-1.244**	-1.163**		0.343
	(0.520)	(0.496)		(0.912)
NFA (% of GDP)	-0.206***	-0.260***	-0.259**	
	(0.049)	(0.049)	(0.115)	
ODA (% of GDP)	4.412**		13.685***	8.923***
	(2.169)		(5.020)	(3.413)
Openness (% of GDP)	-0.016***	-0.014***		-0.021***
	(0.003)	(0.003)		(0.005)
Public expenditure (% of GDP)		2.327**		
		(0.986)		
FDI (% of GDP)	1.960		1.429	1.776
	(2.369)		(4.478)	(2.816)
Log(Trade)	-0.059	-0.140		
	(0.216)	(0.197)		
Error Correction	-0.247**	-0.256**	-0.127**	-0.182*
	(0.127)	(0.134)	(0.055)	(0.101)
D.Remittances (% of GDP)	19.997	27.051	13.805	18.376
	(21.479)	(29.106)	(14.198)	(18.828)
D.Log(Productivity)	0.012	0.212		-0.331
	(0.217)	(0.183)		(0.268)
D.NFA (% of GDP)	-0.32	-0.066	-0.046	
	(0.048)	(0.083)	(0.035)	
D.ODA (% of GDP)	-28.973		-10.301	-21.158
	(27.174)		(8.067)	(18.088)
D.Openness (% of GDP)	0.003	0.001		0.004*
	(0.048)	(0.002)		(0.002)
D.Public expenditure (% of GDP)		0.107		
		(0.398)		
D.FDI (% of GDP)	-3.672		-3.086	-3.401
	(3.550)		(3.589)	(3.753)
D.log(trade)	-0.081	-0.068		
	(0.066)	(0.060)		
Dummy	-0.074	-0.110	-0.175*	-0.120
	(0.121)	(0.110)	(0.108)	(0.144)
Constant	4.775**	4.728*	0.701**	0.562*
	(2.445)	(2.491)	(0.322)	(0.342)
Number of observations	175	175	175	175
Number of groups	5	5	5	5
Observations by group (T)	35	35	35	35
Log Likelihood	135.749	134.898	114.924	125.675

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***).

Tableau 7: Robustness for MENA

Dependent variable : Real effective exchange rate (log)								
	PMG (1)		MG (2)		DCCE (3)		DCCE (4)	
Remittances (% of GDP)	-3.642**	-7.930***	-9.734***	-10.161***	-9.411***	-6.529*	-8.200**	-7.489**
	(1.554)	(2.403)	(3.088)	(2.910)	(3.201)	(3.496)	(4.032)	(3.118)
Log(Productivity)	1.897***	2.265***	0.067	0.084	0. 019	0.451	-0.084	-0.076
	(0.472)	(0.649)	(0.903)	(0.508)	(.578)	(0.662)	(0.842)	(0.664)
Log(Trade)	0.267	-0.184	0.199	0.150	-0.423	-0.486*	-0.267	-0.241
	(0.249)	(0.285)	(0.264)	(0.247)	(0.258)	(0.287)	(0.371)	(0.305)
NFA (% of GDP)	-0.108		-0.337**		0.059		-0.153	
	(0.100)		(0.166)		(0.162)		(0.273)	
Openness (% of GDP)	-0.013***	-0.012***	-0.011*	-0.009	-0.005	-0.004	-0.023**	-0.017**
	(0.003)	(0.004)	(0.006)	(0.006)	(0.00)	(0.006)	(0.011)	(0.008)
FDI (% of GDP)	2.759*	5.653**	2.004	5.577**	3.434	8.704***	9.553*	9.336**
	(1.679)	(2.815)	(2.676)	(2.738)	(2.241)	(3.084)	(4.517)	(4.03)
Public expenditure (% of GDP)		3.865**		7.767***		-1.337		6.424**
		(1.667)		(2.568)		(2.013)		(3.289)
ODA (% of GDP)	3.317**	4.503**	2.469	1.698	2.659	4.430	6.604	4.139
	(1.512)	(2.210)	(2.927)	(2.694)	(3.513)	(4.310)	(4.934)	(3.732)
Error Correction	-0.110*	-0.097**	-0.187***	-0.186***	-0.441***	-0.358***	-0.123***	-0.152***
	(0.062)	(0.048)	(0.041)	(0.037)	(0.088)	(0.079)	(0.038)	(0.038)
D.Remittances (% of GDP)	8.768	9.660	11.796	13.056	19.553	-1.345	7.406	7.576
	(11.464)	(12.025)	(13.576)	(14.388)	(20.630)	(1.455)	(8.175)	(8.817)
D.Log(Productivity)	-0.351	-0.542	0.053	-0.199	0.103	0.209	0.114	-0.41
	(0.291)	(0.360)	(0.294)	(0.300)	(0.297)	(0.255)	(0.186)	(0.169)
D.Log(Trade)	-0.109	-0.113	-0.128	-0.182**	-0.001	-0.036	-0.029	-0.091
	(0.066)	(0.082)	(0.086)	(0.093)	(0.105)	(0.117)	(0.100)	(0.002)
D.NFA (% of GDP)	-0.136		-0.115		0.193		-0.200	
	(0.134)		(0.107)		(0.248)		(0.172)	
D.Openness (% of GDP)	-0.001	-0.0002	-0.001	-0.0003	-0.002	-0.002	-0.002	-0.001
	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
D.FDI (% of GDP)	-1.971	-1.772	-1.535	-1.757	-2.763	-3.418*	-2.087	
	(2.149)	(1.895)	(1.759)	(1.726)	(2.076)	(1.806)	(1.827)	
D.Public expenditure (% of GDP)		0.139		-0.520		0.302		-0.210
		(0.485)		(0.341)		(0.628)		(0.347)
D.ODA (% of GDP)	-16.335	-22.982	-17.731	-21.451	-13.276	-15.756	-13.043	-22.629
	(15.951)	(21.336)	(16.998)	(18.823)	(12.919)	(14.572)	(10.814)	(18.702)
Dummy	-0.102**	-0.065	-0.073	-0.054	-0.036	0.010	-0.124**	-0.103**
	(0.047)	(0.088)	(0.062)	(0.089)	(0.99)	(0.098)	(0.048)	(0.045)
Constant	-1.593*	-1.611**	0.853***	0.560***	8.641	8.015	1.089***	1.090***
	(0.881)	(0.784)	(0.046)	(0.037)	(10.338)	(7.629)	(0.031)	(0.026)
CD test			2.86	2.49	2.57	4.67	-0.14	-0.32
CD p-value			0.004	0.012	0.010	0.000	0.889	0.745
Number of observations	315	315	315	315	315	315	315	315
Number of groups	9	9	9	9	9	9	9	9
Adj. R-squared			0.57	0.62	0.61	0.65	0.47	0.48

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***). CD: Cross-sectional dependence, PMG: Pooled Mean Group, MG: Mean Group, DCCE: Dynamic Common Correlated Effect.

Tableau 8: Robustness for Middle East

Dependent variable : Real effective exchange rate (log)								
	PMG (1)		MG (2)		DCCE (3)		DCCE (4)	
Remittances (% of GDP)	-7.036***	-6.335***	-8.577***	-8.065***	-20.844	-17.723*	-7.553***	-6.085***
	(2.045)	(1.62)	(2.640)	(2.123)	(13.137)	(10.532)	2.808	(2.104)
Log(Productivity)	-1.244**	-1.163**	-0.520	-0.518	-0.861	-1.059	-0.706	-0.833
	(0.520)	(0.496)	(0.728)	(0.621)	(1.640)	(1.680)	(0.893)	(0.726)
NFA (% of GDP)	-0.206***	-0.260***	-0.230*	-0.260**	0.150	-0.147	-0.258	-0.237*
	(0.049)	(0.049)	(0.139)	(0.118)	(0.404)	(0.418)	(0.183)	(0.140)
ODA (% of GDP)	4.412**		3.131		7.675		5.428*	
	(2.169)		(2.556)		(10.969)		(3.360)	
Openness (% of GDP)	-0.016***	-0.014***	-0.016**	-0.012**	-0.010	-0.028*	-0.018**	-0.019***
	(0.003)	(0.003)	(0.006)	(0.005)	(0.013)	(0.016)	(0.008)	(0.006)
FDI (% of GDP)	1.960		1.401		12.525		4.250	
	(2.369)		(2.269)		(8.333)		(3.024)	
Public expenditure (% of GDP)		2.327**		4.700***		4.553		0.742
		(0.986)		(1.665)		(4.557)		(1.786)
Log(Trade)	-0.059	-0.140	-0.076	0.004	-0.894	-0.511	-0.680**	-0.452
	(0.216)	(0.197)	(0.275)	(0.245)	(0.902)	(0.748)	(0.353)	(0.297)
Error Correction	-0.247**		-0.291***	-0.327***	-0.272**	-0.232**	-0.225***	-0.252***
	(0.127)		(0.065)	(0.061)	(0.131)	(0.101)	(0.059)	(0.054)
D.Remittances (% of GDP)	19.997	27.051	24.374	18.467	30.477	9.725	21.666	22.753
	(21.479)	(29.106)	(26.171)	(20.669)	(30.762)	(11.684)	(21.579)	(24.144)
D.Log(Productivity)	0.012	0.212	0.180	0.413	0.446	0.567	0 .252	0.532*
	(0.217)	(0.183)	(0.470)	(0.374)	(0558)	(0.412)	(0.456)	(0.305)
D.NFA (% of GDP)	-0.32	-0.066	0.046	-0.033	0.334	-0.017	0.166	0.148
	(0.048)	(0.083)	(0.069)	(0.060)	(0385)	(0.072)	(0.134)	(0.137)
D.ODA (% of GDP)	-28.973		-37.100		-9.094		-20.341	
	(27.174)		(34.697)		(5.962)		(18.781)	
D.Openness (% of GDP)	0.003	0.001	0.003**	0.001	0.004**	0.003	0.002***	0.002
	(0.048)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
D.FDI (% of GDP)	-3.672		-2.187		-4.024		-2.713	
	(3.550)		(2.509)		(2.930)		(2.607)	
D. Public expenditure (% of GDP)		0.107		0.083		1.056		0.629
		(0.398)		(0.713)		(0.836)		(0.527)
D. Log(Trade)	-0.081	-0.068	-0.028	-0.043	0.064	0.0007	0.043	0.025
	(0.066)	(0.060)	(0.074)	(0.047)	(0.125)	(0.080)	(0.067)	(0.083)
Dummy	-0.074	-0.110	-0.070	-0.154	0.030	-0.022	-0.142*	-0.110
	(0.121)	(0.110)	(0.117)	(0.112)	(0.141)	(0.104)	(0.086)	(0.110
Canstant	4.775**	4.728*	3.655***	3.641***	2.925	9.226	3.912***	4.468***
	(2.445)	(2.491)	(0.122)	(0.109)	(8.228)	(7.146)	(0.090)	0.121
CD test			1.67	1.17	-0.91	1.05	-1.11	-1.34
CD p-value			0.095	0.240	0.362	0.2941	0.265	0.181
Number of observations	175	175	175	175	175	175	175	175
Number of groups	5	5	5	5	5	5	5	5
Adj. R-squared			0.59	0.59	0.55	0.51	0.44	0.44

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***). CD: Cross-sectional dependence, PMG: Pooled Mean Group, MG: Mean Group, DCCE: Dynamic Common Correlated Effect

Table 9: Robustness for North Africa

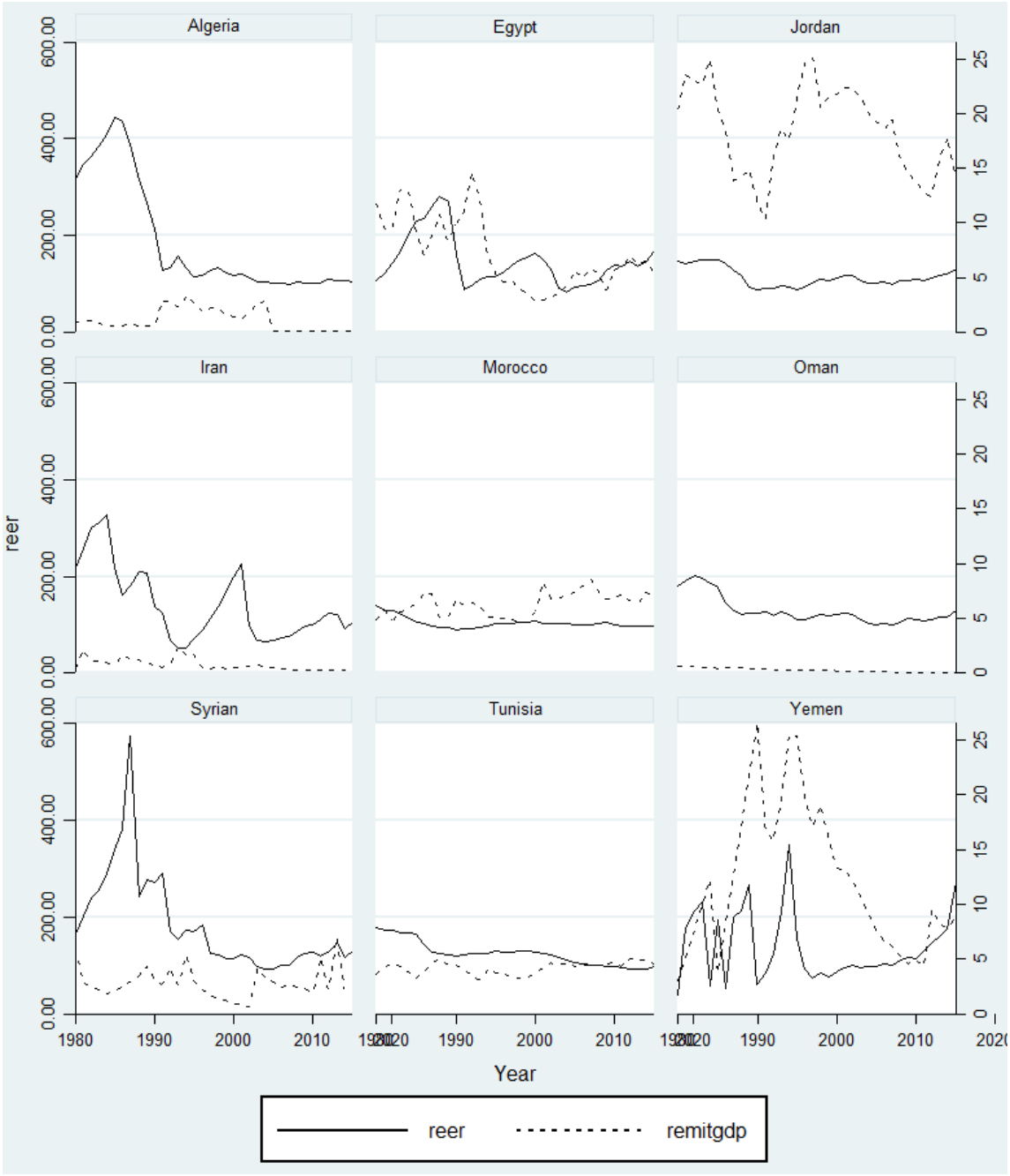
Dependent variable : Real effective exchange rate (log)			
	PMG	MG	DCCE
Remittances (% of GDP)	-7.631***	-7.516*	-8.349*
	(2.924)	(4.313)	(0.085)
Log(Productivity)	0.520	1.161	0.485
	(0.430)	(0.979)	(0.985)
NFA (% of GDP)	0.395	-0.133	2.142
	(0.399)	(1.274)	(1.752)
Public expenditure (% of GDP)	-0.813	0.748	3.393
	(2.125)	(6.493)	(9.704)
Error Correction	-0.057*	-0.217***	-0.191**
	(0.035)	(0.072)	(0.085)
D.Remittances (% of GDP)	-2.901	-2.148	-2.339
	(2.241)	(1.737)	(2.039)
D.Log(Productivity)	0.354	-0.074	0.001
	(0.535)	(0.447)	(0.531)
D.NFA (% of GDP)	-0.253	-0.476	-0.498
	(0.281)	(0.538)	(0.448)
D.Public expenditure (% of GDP)	-0.453	-0.529	-0.509
	(1.891)	(2.035)	(2.345)
Dummy	-0.183	-0.126*	-0.094**
	(0.121)	(0.070)	(0.037)
Constant	-0.011	-3.745	-1.660
	(0.011)	(4.230)	(3.136)
CD test		0.34	0.12
CD p-value		0.736	0.902
Number of observations	140	140	140
Number of groups	4	4	4
Adj. R-squared		0.66	0.67
Log Likelihood	233.910		

Notes: Standard error in parentheses; significance levels of 10% (*), 5% (**), and 1% (***). PMG: Pooled Mean Group, MG: Mean Group

Table 10: Sources for statistical data

Variables	Description	Unit	Sources
Real Effective Exchange Rate (REER)	Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.	Index	International Monetary Fund
Net barter terms of trade (TOT)	Net barter terms of trade index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000.	Index	World Bank
Remittances, received (Remit)	Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households. Personal transfers thus include all current transfers between resident and nonresident individuals. 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.	% of GDP	World Bank
Foreign direct investment, net inflows (FDI)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.	% of GDP	World Bank
Labor productivity per person	Includes information on manufacturing productivity and unit labor cost growth, as derived from The Conference Board International Labor Comparisons database, which The Conference Board took over from the U.S. government's Bureau of Labor Statistics in 2013.	USD	The Conference Board International Labor Comparisons
General government final consumption expenditure	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defense and security, but excludes government military expenditures that are part of government capital formation.	% of GDP	World Bank
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	% of GDP	World Bank
Net foreign assets	Net foreign assets are the sum of foreign assets held by monetary authorities and deposit money banks, less their foreign liabilities.	USD	
Net Official Development Assistance	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent). Net official aid refers to aid flows (net of repayments) from official donors to countries and territories in part II of the DAC list of recipients: more advanced countries of Central and Eastern Europe, the countries of the former Soviet Union, and certain advanced developing countries and territories.	% of GDP	World Bank

Figure 1: Trend of remittances and real effective exchange rate from 1980 to 2015



Sources: Authors.