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Linking remittances with financial development and institutions: a study from selected MENA countries

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Abstract

This paper seeks to examine the effect of remittances on economic growth in Middle East and North Africa (MENA) countries. Using unbalanced panel data covering a sample of 12 MENA countries over the period 1984-2012, we studied the hypothesis that the effect of remittances on economic growth varies depending on the level of financial development and institutional environment in recipient countries. We use GMM estimation in which we address the endogeneity of remittances. Our results reveal a complementary relationship among financial development and remittances to ensure economic growth. The estimations also show that remittances promote growth in countries with a developed financial system and a strong institutional environment.

Keywords Remittances, economic growth, financial development, institutional quality
JEL Classification G23, O17, O22

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Highlights

- We examine the effect of remittances on growth, in particular how the local financial sector and institutional environment influence this effect.
- We employ panel data for 12 MENA countries.
- We find that remittances promote growth in countries with a developed financial system and strong institutional environment.

1. Introduction

The increase in the volume of international migration over recent decades has led to an unprecedented increase in financial flows to labor-exporting countries. Indeed, international migrant remittances have begun to be a significant source of external financing for developing countries. Only considering remittances passing through formal channels, the World Bank estimates that remittances reached US$ 440 billion in 2013 (World Bank, 2014). In fact, remittances sent to developing countries have increased spectacularly over the last three decades to represent the large majority of remittance flows today. According to the World Bank (2014), formally recorded remittances sent to developing countries reached US$ 325.5 billion in 2010. After a modest decline in 2009 because of the global financial crisis, the flow of remittances to developing countries was expected to grow at a lower but sustainable rate of 7-8 percent annually during 2013-2018 to reach US$ 550 billion by 2016. However, remittances benefit some regions more than others. With US$ 73 billion of remittances, the MENA region is one of the top remittance recipients in the world after East Asia and the Pacific, Latin America and the Caribbean.

However, the recorded data on remittances is imperfect and underestimates the true amount. On the one hand, many developing countries do not report remittance data in their balance of payments (e.g. Afghanistan, Cuba). On the other hand, since fees for sending money (for example, those of banking systems or established money transfer operators) are relatively high, remittances are often sent via informal channels such as friends, relatives and the Hawala system. El-Qorchi, Munzele and Wilson (2003) argue that the informal flows are estimated to be very high, in the range of 10% to 50% of recorded remittances. Remittance fees are known to be high; the World Bank estimates the cost to be about 10% of the amount sent. At the same time, there is a huge variation in the fees depending on the. Migrants might access official

services, but the high costs of operations may discourage others migrants with low revenue from sending small amounts. Moreover, financial services may be accessible to migrants, but this will not be the situation for the receivers. High costs are mostly due to socioeconomic factors, the financial market and government policy in the sending and the receiving countries.

In literature surveys, the macroeconomic effects of remittances have been the subject of renewed attention in recent years. While some studies have provided evidence that remittances may increase investments (Woodruff and Zenteno, 2007 ; Giuliano and Ruiz-Arranz, 2009), make human capital accumulation easy (Edwards and Ureta, 2003 ; Rapoport and Docquier, 2005 ; Calero, Bedi and Sparrow, 2009 ; Combes and Ebeke, 2011), enhance total factor productivity (Abdih et al., 2012) and alleviate poverty (Akobeng, 2016 ; Majeed, 2015 ; Adams Jr and Cuecuecha, 2013), other studies have pointed out that remittances may significantly reduce work effort (Chami et al., 2005), create moral hazards (Gubert, 2002), accelerate inflation (Khan and Islam, 2013), and lead to Dutch disease effects i.e. an appreciation in the real exchange rate accompanied by resource allocation from the traded sector towards the non-traded sector (Amuedo-Dorantes, Pozo and Vargas-Silva, 2010 ; Bourdet and Falck, 2006 ; Acosta, Lartey and Mandelman, 2009). However, the majority of these studies have only focused on the direct effects of remittances and they do not incorporate the indirect effects. In this literature, the authors regressed per capita growth on both the workers remittances and a set of control variables. Some of these control variables also include the channels through which remittances affect growth. Such specifications are likely to give unreliable estimates because the channels may also capture the growth effects of remittances. Thus, migrants' remittances may reduce the volatility of income, promote the financial sector and increase the quality of institutions. They can also promote both human and physical capital investment. The aim of this paper is to examine the indirect link between remittances and growth in MENA countries, looking specifically at the interaction between remittances and financial development, on the one hand, and between remittances and the level of institutional quality, on the other hand. To do this, a number of interaction variables have been included in the empirical investigations to gauge the best conditions in which remittances can involve economic growth.

Our several regressions show that a solid financial system and stable political environment complement the positive effect of remittances on economic growth. The remainder of this paper is organized as follows. The next section gives a literature survey of the relationships between remittances and economic growth. Section 3 describes the data, model

specification and econometric technique. Section 4 discusses our empirical results, and finally, section 4 provides concluding remarks.

2. Literature survey

For the receiving countries, there are serval channels through which remittances may affect economic growth. Remittances can increase the national disposable income, household savings, domestic investment and the accumulation of physical and human capital. They can reduce the volatility of production and consumption. However, an excessive volume of migrant's remittances may affect currency appreciation, which negatively affects the competitiveness of exports or creates a moral hazard problem by inducing disincentives to work.

However, neither theoretical nor empirical studies have provided a conclusive answer regarding the effect of remittances on economic growth. Faini (2002) provides evidence that remittances have a positive effect on economic growth. However, Chami, Fullenkamp and Jahjah (2003) find a negative correlation between remittances and growth. The authors have argued that remittances are likely to substitute work for leisure, generally known as moral hazard. Lucas (2005) and the IMF World Economic Outlook (2005) criticize Chami's study for not taking into account remittances' endogeneity problem. In the Philippines, using Impulse Response Functions and annual data for 1985-2002, Burgess and Haksar (2005) report a negative indication between remittance and growth measured by the growth rate of the Gross Domestic Product (GDP) per capita. However, Ang (2009) concludes that the overall impact of remittances on growth is positive for the same country. Ziesemer (2012) provides a study suggesting that the effect of remittances on economic growth is more visible in low-income countries (income lower than 1200 USD per capita). Moreover, the author shows that the growth rate is two percentage points higher in the presence of remittances. For Latin American countries, Mundaca (2009) uses the domestic bank credit as a regressor to examine the effect of remittances on growth. She also finds a positive effect of remittances on economic growth. According to the author, a 10% increase in remittances (as a percentage of the GDP) contributes to increasing the GDP per capita by 3.49%. When she removes domestic bank credit from the equation, the GDP per capita increases only by 3.18%.

Most recently, in Sub-Saharan African (SSA) countries, Singh et al. (2011) report that the impact of international remittances on economic growth is negative. However, countries

with good governance have more opportunity to unlock the potential for remittances to improve economic growth. In a related study, using annual panel data for 64 African, Asian, and Latin American-Caribbean countries from 1987–2007, Fayissa and Nsiah (2012) find that there is a positive relationship between remittances and economic growth throughout the whole group. In contrast, Ahamada and Coulibaly (2013) report that there is no causality between remittances and growth in 20 SSA countries. Adams and Klobodu (2016) using the General Method of Moments estimation technique, examine the effect of remittances and regime durability on economic growth find that remittances do not have a robust impact on economic growth in SSA.

Until the last decade, most empirical studies seemed to neglect other channels through which remittances can stimulate economic growth. As we stated above, remittances can increase the volume of disposable income and savings. Thus, they can stimulate the investment rate and hence economic growth. In Pakistan, Adams, Jr (2003) shows that international remittances have a positive effect on the saving rate. For the author, the marginal propensity to save for international remittances is 0.71, while the marginal propensity to save on rental income is only 0.085. Moreover, the author demonstrates that the Pakistani households receiving remittances have a very high propensity to save, and the effect of remittances on growth could be amplified if remittances are channeled by the banking sector. In Kyrgyzstan, Aitymbetov (2006) finds also that remittances positively affect economic growth because about 10% of transfers are invested. Woodruff (2007) confirms the finding since he finds a positive relationship between investment and the creation of micro-enterprises. For the author, 5% of remittances received are invested in this type of company. In long term, they can be seen as a "growth locomotive" because they improve the labor supply. Finally, in five Mediterranean countries, Glytsos (2005) investigates the impact of exogenous shocks of remittances on consumption, investment, imports, and output. He builds a Keynesian model in which he includes the remittances as part of disposable income and finds a positive effect of income on consumption and imports. For the author, the effect of remittances on growth passes through the income disposable and investment channels.

These empirical studies investigate the direct effect of remittances on the determinants of economic growth. However, other researchers have investigated the indirect effect by incorporating an interaction terms between international remittances and other variables that could complement the direct effect in stimulating growth. Fajnzylber et al. (2008) explores for

Latin American countries the remittances' effect on real per capita growth. The authors include as a regressor a term of interaction between remittances and human capital, political institutions and the financial system depth. They find a negative indication of the remittances' coefficient and a positive indication of the interaction term when human capital and institutions are included. However, the remittances coefficient has a positive indication and the interaction term has a negative indication when financial system depth is included. Fajnzylber et al. (2008) conclude that human capital accumulation and improvement in institutional quality enhance the positive effect of remittances on economic growth. But financial depth substitutes for international remittances in stimulating growth. On the basis of these findings, remittances are considered to be ineffective in enhancing economic development in countries where institutions are weak or where there is low human capital accumulation. Giuliano and Ruiz-Arranz (2009) conducted a study similar to Mundaca's. They used financial development in interaction with remittances as regressor and found that remittances may ease credit constraints on the poor, increase the allocation of capital, and substitute for the absence of financial development. In addition, Bettin and Zazzaro (2012) include an interaction variable (remittances multiplied by bank efficiency index) and find a complementary relation between remittances and financial development (i.e. remittances have a positive indication and the interaction term has a negative indication). Like Giuliano and Ruiz-Arranz (2009), Catrinescu et al. (2009) use political and institutional variables as terms of interaction with remittance. The authors, using the Anderson-Hsio estimator, found a positive relation between transfers and growth. However, Barajas, Chami and Fullenkamp (2009) use microeconomics variables as instruments to thwarting potential endogeneity between remittances and growth. They find non-significant direct effects of growth of remittances in an estimate for a panel of 84 developing countries.

The literature review reveals that the effect of remittances on economic growth is influenced by the observed and in observed countries specific effect, the endogeneity of remittances and by the econometric specification. Accordingly, we control for this factor in our analysis and also take into consideration the level of political environment in MENA countries. The model specification and the econometric technique are described next.

3. Model specification and econometric technique

3.1. Model specification and estimation method

To examine the links among remittances, financial development, institutional quality and economic growth, we have used an extended version of the growth model of Barro (1991 ; 1996) and Imai et al. (2014). The following reduced-form regression is used:

$$GrowthGDP_{it} = \alpha_0 + \beta_1 Rem_{it} + \phi X_{it} + \eta_t + \vartheta_{i+} \varepsilon_{it} \quad (1)$$

Here, $GrowthGDP_{it}$ indicates the (logarithm of) growth of real GDP per capita in country i at time t. REM_{it} is the key explanatory variable referring to the ratio of the remittances to GDP. Remittances are the current transfers sent by resident or nonresident workers to the country of origin. η_t is the time specific effect, ϑ_i is an unobserved country specific effect and ε_{it} is the error term. X_{it} contains a standard set of determinants of economic growth.

As a starting point, we do not include any variables for financial development or institutional quality. However, in a second set of regressions, we test the hypothesis that the responsiveness of economic growth to remittances depends on the level of financial development and the level of institutional quality. In other words, we explore how the financial depth or the institutional quality level of the recipient country affects the impact of remittances on economic growth. The novelty of our paper lies in its estimation of the combined effect of remittances and our conditional variables (financial development or the institutional quality). To this end, we introduce in Equation (1) an interaction term between remittances and the financial development level or the institutional quality. The modified versions of Equation (1) that include the interactive terms can be written as:

$$GrowthGDP_{it} = \alpha_i + \beta_1 Rem_{it} + \beta_2 (Rem_{it} \times Findvp_{it}) + \beta_3 Findvp_{it} + \phi X_{it} + \eta_t + \vartheta_{i+} \varepsilon_{it} \quad (2)$$

$$GrowthGDP_{it} = \alpha_i + \beta_1 Rem_{it} + \beta_2 (Rem_{it} \times InsQ_{it}) + \beta_3 InsQ_{it} + \phi X_{it} + \eta_t + \vartheta_{i+} \varepsilon_{it} \quad (3)$$

In Equation (2) we test whether remittances and financial development should complement or substitute for each other. However, in Equation (3) we test the hypothesis that the institutional quality of the recipient country influences the capacity of remittances to affect economic growth. However, this paper is interested in β_1 and β_2, which provide information on the marginal impact[2] of remittances on growth conditional upon the financial development level or the institutional quality. β_1 and β_2 make it possible to assess whether remittances have different influences on growth in countries with high values of financial development/

[2] β_1 measures the direct effect while β_2 represents to the indirect effect.

institutional quality. In Equation (2), if β_2 is negative, remittances are more effective in promoting growth in countries with a shallower finance system. In other words, a negative interaction means that remittances have de facto acted as a substitute for financial services to enhance economic growth. However, a positive interaction suggests that remittances and the financial system are complements (a better functioning financial system would lead remittances towards growth-enhancement). In a similar way, in Equation (3), a positive interaction would indicate that the institutional quality enhances the positive effect of remittances on growth[3]. Otherwise, when the interaction is negative, the institutional quality diminishes ($\beta 1 > 0$) or alleviates ($\beta 1 < 0$) the negative impact of remittances on growth.

An important methodological challenge is related to the presence of endogenous regressors. Thus, the presence of a lag-dependent variable on the right hand of the equation, the inverse causality relationship between remittances and growth (i.e. remittances may affect the growth of the receiving countries and thereby affect the future amount of remittances received), reverse causality between the dependent variables and some of our explanatory variables (i.e. remittances, revenue, inflation, GDP growth and the quality of institutions) will lead to simultaneity bias of the regression's coefficients. Analysts who consider this endogeneity problem often use the Generalized Method of Moments (GMM) estimation technique developed by Arellano and Bond (1991) and Blundell and Bond (1998). The GMM estimator has the advantage that it is more efficient than the OLS estimator. It is also widely known as a solution to measurement errors (errors in variables) and omitted-variable biases (Guillaumont S and Kpodar, 2006). For the endogenous variables, we rely on the internal instruments that are one lag variables. To check the validity of the instruments, the Sargan/Hansen test has been applied. In addition, a number of econometric tests have been investigated (tests of collinearity, causality and endogeneity).

Differentiating equations (2) and (3) with respect to remittances, we can check if remittances have a different influence on growth in countries with high values of financial development[4] (institutional quality[5]) as well as countries with low values. Moreover, according

[3] when β_1 is negative, the institutional quality reduces the negative effects of remittances on growth.
[4] Equation 4
[5] Equation 5

to Equations (4) and (5), Equation (6) captures the complete relationship between remittances and GDP per capita growth for different levels of financial development (institutional quality)

$$\partial GDP/\partial REM = \beta_1 + \beta_2 \times Findvp_{it} \quad (4)$$

$$\partial GDP/\partial REM = \beta_1 + \beta_2 \times InstQ_{it} \quad (5)$$

$$\nu = \beta_1 + \beta_2 \times Findvp(InstQ) \times Rem \quad (6)$$

3.2. Variable definitions and data

To capture the role of financial development and institutional level on the effect of remittances on growth, we use respectively three and four proxies. For the financial development proxy, all variables are related to the banking sector. First, to evaluate the financial intermediation, we use first domestic credit to the private sector by banks as a percentage of GDP. The second variable represents liquid liabilities (broad money) as part of GDP. This variable is defined as the sum of currency and deposits in the central bank liquid liabilities divided by GDP. It is used as a proxy of the size of financial intermediaries relative to the size of the economy. Finally, the bank efficiency ratio is also used. This proxy gives us an idea of banking productivity. The ratio is a quick and easy measure of a bank's ability to turn resources into revenue. The ratio is defined as the sum of expenses (without interest expenses) divided by the revenue. The following variables have been chosen to form the financial indicator of World Development Indicators (WDI). Similarly, institutional quality level is proxied by International Country Risk Guide index of political risk. In accordance with Bekaert et al. (2006), we use the Political Institutions Index, wich the sum of the subcomponents military in politics and democratic accountability. The quality of the Institutions Index is used to capture corruption, law and order, and bureaucratic quality. We also use the Socioeconomic Environment Index that is indicative of stability, socioeconomic conditions, and the investment profile. Finally, we use the Conflict Risk Index to capture the internal and external conflict.

As mentioned above, remittances include 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. The remittances variable is scaled by the home country's GDP. The choice of the variables and the

proxies of the detriments of growth is guided by the literature (Barro, 1996; Giuliano and Ruiz-Arranz, 2009 ; Combe and Ebeke, 2011 ; Imai, K. et al., 2014). These variables consist of past GDPt-1 to test the convergence hypothesis (Barro, 1996). Investment represent the gross fixed capital formation as a percentage of real GDP is used as a proxy for investment in physical capital. Trade openness is defined by the ratio of the sum of exports and imports over GDP is used to evaluate the country's degree of openness. The inflation rate is a proxy to monetary discipline and macroeconomic stability. Government consumption is defined as the ratio of government consumption to GDP. The full sample dataset comprises an unbalanced panel of 12 countries and both four-year average and annual data covering the period 1984 – 2012. The initial year is chosen due to availability. The summary statistics, the variable definitions as well as data sources are provided in the appendix A (Table 1 and Table 2).

Table 3: Remittances, financial development and growth (*GMM-System estimation*)

Independent variables	***Dependent variable: GDP per capita growth***													
	Annual data							***4 year average data***						
		Fin. devp 1		**Fin. devp 2**		**Fin. devp 3**			**Fin. devp 1**		**Fin. devp 2**		**Fin. devp 3**	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GDP_{t-1} per capita	-0.9940 (0.25)***	-0.4545 (0.10)***	-1.4534 (0.39)***	-2.4551 (0.09)***	-0.4550 (0.34)***	-2.4532 (0.45)***	1.1492 (0.11)***	-0.7950 (0.07)***	-0.8843 (0.10)***	-0.9093 (0.09)***	-0.8391 (0.09)***	-0.4344 (0.11)***	-0.7986 (0.07)***	0.7492 (0.11)***
Investment	0.4595 (0.11)**	0.5566 (0.34)*	1.3554 (0.61)**	0.4534 (0.21)**	1.4850 (0.43)**	0.5556 (0.18)***	0.8248 (0.32)**	0.5181 (0.21)**	0.4157 (0.24)*	1.0927 (0.41)**	0.6284 (0.24)**	0.8248 (0.32)**	0.5976 (0.20)***	0.1248 (0.32)**
Human capital	0.1984 (0.24)	0.0545 (0.16)	-0.1458 (0.47)	0.3453 (0.43)	0.8643 (0.45)	0.1445 (0.16)	0.2664 (0.31)	0.1625 (0.19)	0.0029 (0.36)	-0.1348 (0.47)	0.0380 (0.23)	0.0229 (0.31)	0.1298 (0.19)	0.1229 (0.31)
Government spending	-0.8593 (0.28)**	-0.5346 (0.32)**	-1.4523 (0.51)**	-0.3563 (0.18)**	-0.4554 (0.29)	-0.4548 (0.08)***	-0.4564 (0.39)	-1.5890 (0.18)**	-0.5583 (0.20)**	-1.0023 (0.41)**	-0.5027 (0.20)**	-0.1531 (0.29)	-0.5398 (0.18)***	-0.2531 (0.19)
Population growth	-0.2543 (0.09)***	-0.5543 (0.33)***	-0.3535 (0.65)	-0.2342 (0.08)***	-0.5424 (0.34)	-0.4635 (0.11)***	-0.3466 (0.56)	-0.2962 (0.09)***	-0.3720 (0.10)***	-0.2633 (0.24)	-0.3438 (0.10)***	-0.1231 (0.12)	-0.2846 (0.09)***	-0.3236 (0.62)
Openness	-0.2455 (0.33)	-0.1375 (0.14)*	-0.4549 (0.21)**	-0.3433 (0.39)	-0.5324 (0.33)	-1.4433 (0.45)*	-0.4450 (0.56)	-0.2415 (0.13)	-0.0975 (0.14)*	-0.6507 (0.31)**	-0.1958 (0.15)	-0.1628 (0.20)	-0.2132 (0.13)*	-0.5324 (0.26)
Inflation	-0.2353 (0.24)	0.0465 (0.32)	-0.4568 (0.77)	-0.3533 (0.65)	-0.8666 (0.54)	-0.3653 (0.65)	-0.2662 (0.64)	-0.1425 (0.53)	-0.0975 (0.32)	0.1958 (0.23)	0.6507 (0.65)	-0.6507 (0.43)	-0.1958 (0.45)	-0.3423 (0.44)
Remittances	-0.3450 (0.50)	-0.5669 (0.54)	0.0465 (0.03)**	0.3434 (0.54)	-0.1454 (0.53)**	0.2553 (0.34)	-0.5454 (0.16)***	-0.0688 (0.04)	-0.0339 (0.09)	0.0453 (0.04)**	0.0694 (0.01)*	-0.4352 (0.18)**	0.1694 (0.04)	-0.4634 (0.18)***
Financial development 1		**0.3423 (0.13)****	**0.1379 (0.07)****						**0.2623 (0.11)****	**0.2947 (0.23)***				
Remittances × Fin. development 1			**0.1340 (0.06)****							**0.2215 (0.10)****				
Financial development 2				**0.4544 (0.28)***	**0.4534 (0.56)***						**0.1830 (0.09)****	**0.2424 (0.14)***		
Remittances × Fin. development 2					**0.1452 (0.03)****							**0.1873 (0.01)****		
Financial development 3						**1.2424 (0.64)***	**0.4643 (0.22)***						**0.1830 (0.09)****	**0.1674 (0.13)***
Remittances × Fin. development 3							**0.5543 (0.33)****							**0.1453 (0.01)****
Observations	245	254	268	258	267	2261	240	58	54	57	56	52	58	55
AR (1)	(0.000)	(0.001)	(0.033)	(0.001)	(0,001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.030)	(0.001)	(0,001)	(0.020)	(0.000)
AR (2)	(0.142)	(0.331)	(0.553)	(0.538)	(0,198)	(0,539)	(0. 313)	(0.342)	(0.331)	(0.539)	(0.138)	(0,398)	(0,539)	(0. 333)
Hansen (p-value)	(0.114)	(0.154)	(0.133)	(0.433)	(0,443)	(0,236)	(0.243)	(0.394)	(0.144)	(0.136)	(0.487)	(0,487)	(0,136)	(0.263)

Financial development 1: Financial intermediation. Financial development 2: Liquid liabilities. Financial development 3 : Bank efficiency ratio. For the Sargan test, the null hypothesis is that the instruments do not correlate with the residuals. The Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR (2), the null hypothesis is that the errors in the first difference regression exhibit no second-order serial correlation. Standard errors in parenthesis. ***, **, * refer to the 1, 5 and 10% levels of significance, respectively.

Table 4: Remittance institutions' quality and growth

Independent variables	***Dependent variables : GDP per capita growth (Annual data)***									
	InstQ= ICRG		**InstQ= ICRG 1**		**InstQ= ICRG 2**		**InstQ= ICRG 3**		**InstQ= ICRG 4**	
	1	2	3	4	5	6	7	8	9	10
GDP_{t-1} per capita	-0.1855 (0.13)***	-1.2340 (0.09)***	-2.5741 (1.09)*	-3.5734 (0.44)***	-2.4432 (0.45)***	-2.9482 (0.41)***	-0.7950 (0.07)***	-2.3424 (0.39)***	-0.8573 (0.03)***	-0.8464 (0.04)***
Investment	1.5346 (0.24)***	1.0093 (0.49)*	0.7634 (0.25)**	1.4432 (0.31)**	1.5536 (0.33)***	1.0495 (0.32)**	1.5181 (0.41)**	1.9483 (1.03)**	0.7432 (0.30)**	0.4403 (0.34)**
Human capital	0.4343* (0.22)	-0.8933 (1.47)	1.4940 (1.56)	0.6422 (1.22)	2.4542* (1.36)	0.5452 (1.31)	0.1625 (0.19)	-0.1348 (1.47)	2.4638 (3.23)	1.8963 (0.32)
Government spending	-1.00043 (0.11)***	-1.0344 (1.51)**	-0.5698 (0.05)***	-0.1643 (1.43)	-0.4553 (0.48)***	-0.5322 (1.39)	-1.5890 (0.18)***	-1.0023 (0.31)**	-0.8320 (0.21)**	-0.0484 (0.43)
Population Growth	-0.3334 (0.23)*	-1.2440 (1.65)	-2.1322 (0.98)**	-2.4052 (1.32)*	-1.1553 (0.29)**	-0.3533 (3.54)	-0.2962 (0.09)***	-0.2633 (0.44)	-0.5322 (0.21)***	-0.0393 (0.43)
Openness	-0.1475 (0.17)	-0.4547 (0.31)**	-0.2402 (0.32)	-0.2445 (0.43)	-1.4532 (0.45)*	-0.4324 (0.56)	-0.2415 (0.63)	-0.6507 (0.21)**	-0.3426 (0.81)	-0.4034 (0.33)
Remittances	0.5669 (0.54)	-1.8354 (0.55)**	1.0831 (1.54)	-0.9423 (0.32)**	0.4533 (2.03)	-0.9545 (0.14)***	-0.0688 (0.14)	-0.8694 (0.24)**	0.00332 (0.04)	-0.0843 (0.21)**
ICRG	**-0.1543 (0.03)****	**-0.1734 (0.05)****								
Remittances × ICRG		**0.0305 (0.00)*****								
ICRG 1			**-2.8392 (2.84)**	**-0.3432 (0.26)**						
Remittances × ICRG 1				**0.9832 (0.63)***						
ICRG 2					**0.8742 (1.34)**	**1.0344 (1.12)**				
Remittances × ICRG 2						**0.9534 (0.33)****				
ICRG 3							**0.8770 (2.54)**	**0.4643 (1.12)**		
Remittances × ICRG 3								**0.5543 (0.03)*****		
ICRG 4									**2.2342 (2.34)**	**0.4435 (0.12)**
Remittances × ICRG 4										**0.3433 (0.23)****
Observations	254	268	258	267	251	240	246	257	256	252
AR (1)	(0.001)	(0.033)	(0.001)	(0,001)	(0.000)	(0.000)	(0.000)	(0.030)	(0.001)	(0,001)
AR (2)	(0.331)	(0.553)	(0.538)	(0,198)	(0,539)	(0. 313)	(0.342)	(0.539)	(0.138)	(0,398)
Hansen (p-value)	(0.154)	(0.133)	(0.433)	(0,443)	(0,236)	(0.243)	(0.394)	(0.136)	(0.487)	(0,487)

ICRG: institutional quality published by the PRS group. The quality of institutions is an index ranging from 0 (minimum quality) to 100 (maximum quality). ICRG 1 (political institutions): the sum of the subcomponents 'military in politics' and 'democratic accountability'. ICRG2 (quality of institutions): is the sum of corruption, law and order, and bureaucratic quality. ICRG3 (socioeconomic environment): sum of government stability, socioeconomic conditions, and investment profile. ICRG4 (conflicts): internal and external conflict, ethnic and religious tensions. Standard errors in parenthesis.***, **, * refer to the 1, 5 and 10% levels of significance respectively.

4. Evaluation of the results

In this section, we present the results obtained from the estimations of our models. This analysis will primarily focus on our variables of interest (remittances, financial development, and institution quality), although we analyze the results obtained from the variables of control. Tables 3 and 4 present the results of the GMM dynamic estimations. The estimation regressions satisfy mutually the Sargan test of over-identifying restrictions and the serial correlation test. In all our results, the Hansen test shows that our instruments are valid (do not reject the null hypothesis). Moreover, AR(1) and AR(2) are tests for first order and second order serial correlation in the first differenced residuals under the null of no serial correlation.

The results of the benchmark model are reported in table 3, columns 1 (annual data) and 8 (4-year average data). The estimations show that the coefficient of the GDP lag is negative and indicate the presence of a convergence process. The poor countries grow faster than rich economies, once the determinants of their steady state are held constant. These results are consistent with the standard growth theory which suggests that the economy tends to approach its long run position if the starting per capita is low (Barro and Sala-I-Martin, 1995 ; Easterly and Levine, 1995). As expected, a positive correlation between investment and economic growth is found. A higher level of private investment leads to higher economic growth. However, population growth rate, trade openness and government spending negatively affect the rate of economic growth (Jongwanich, 2007 ; Acosta et al., 2009). This finding seems to validate the idea that higher involvement of the government in the economy will have significate consequences on the growth performance ((Fölster and Henrekson, 2001). Finally, the effects of human capital and inflation are insignificant although the coefficients change from one specification to another.

Moving to our key variables, we can see that all our measures of financial development are positive and statistically different to zero. However, the estimated coefficients of remittances are not statistically different from zero (remittances do not have a strong impact on economic growth). These findings are consistent with Barajas, Chami and Fullenkamp (2009), but in contrast to the literature reviews that have found a positive effect of remittances on consumption, investment, and health outcomes. These results lead to a question about the nature of the relationship between remittances and growth. This relationship seems to be nonlinear. In other words, the effect of remittances on economic growth may depend on other variables.

Thus, we explore this avenue by investigating whether the financial development and the institutional level of the receiving countries influence the effect of remittances on the performance of economic growth.

First, we estimate Equation (2) in which a number of interaction variables have been added. We explore whether there is a substitutability or complementarity relationship between remittances and financial development in promoting economic growth in MENA countries. Columns 3 to 14 present the outcomes of the regression models for both annual and four-year average data. In each column, we use one proxy of financial development. The estimated coefficients of remittances and the interaction term are significantly negative. As we explain above, the remittances and the financial development have a complementary effect in boosting the growth of GDP. This finding suggests that remittances have a positive effect on economic growth only if the domestic banking system is sufficiently sound. Similar findings were also obtained by Bettin and Zazzaro (2012) and Nyamongo et al.(2012). However, these results are not in line with Barajas, Chami and Fullenkamp (2009), and Giuliano and Ruiz-Arranz's (2009) studies which supported the complementary view. Unlike our study, Giuliano and Ruiz-Arranz use only measures of the size of the financial sector, ignoring its efficiency.

Otherwise, taking the ratio of domestic credit provided by the banking sector to GDP as the measure of financial development, the threshold from which remittances could have a positive effect on economic growth is 2.32[6] while the sample mean is 2.49. This means that only a few countries can concretely benefit from remittances. Based on column 12, the direct effect is -0.4352. This is much larger than the indirect effect in absolute terms 0.1830 (the elasticity of economic growth with respect to remittances). For example, in the case of Turkey, the total effect is 0.034, obtained by multiplying 0.1830 by the Turkish financial development mean and adding -0.4352. This indicates that a 1% increase in the share of remittances in GDP leads to a 0.034% increase in the GDP per capita growth ratio. However, in Egypt, a 1% increase in remittances leads to a 0.20% decrease in the GDP per capita growth ratio. Figures 1 in the appendix shows the impact of remittances on GDP per capita computed for each country at the mean level of the ratio of domestic credit provided by the banking sector to GDP. Out of 12 countries considered in the analysis, only Turkey, Tunisia and Morocco seem to benefit overall from remittances (Appendix B, Figure 1).

[6] $-\beta 1/\beta 2 = -(-1{,}8354/0{,}0305) = 60$

Finally, in table 4 we report the estimates of Equation (2) to test the interaction between remittances, economic growth, and the institutional environment. In other words, the specification allows us to test the hypothesis that the effect of remittances on growth is conditioned by the institutional quality. We present five specifications. In the first, we use the composite institutional index (ICRG). This index published by the PRS group[7] is composite Political, Financial, Economic Risk rating. It's ranging from 0 for very high risk to 100 for very low risk. In the other specifications, we only use the four components of this composite index (ICRG 1, ICRG2, ICRG3, ICRG4). The estimates show two very important results. First, the results show that the interaction variables and remittances are negative and significant (column 2, table 4). This suggests that the marginal effect of remittances is higher in countries with a more stable political environment. Second, for our sample, the results illustrate the presence of a threshold effect beyond which remittances can be a growth enhancer. In order for remittances to contribute to economic growth, MENA countries must possess a level of institutional quality greater than the threshold level of 60%[8]. Out of 12 countries considered in the analysis, only Tunisia, Jordan and Morocco seem to benefit overall from remittances (Appendix B, Figure 2). These findings are consistent with Catrinescu et al. (2009). For the authors, a low level of ethnic tension, good governance, the prevalence of law and order and good socioeconomic conditions are preconditions for the successful use of migrant remittances.

5. Conclusion

This paper examines the interaction between remittances, financial development, level of the institutional environment and economic growth in 12 MENA countries. The study covers the period of 1984-2012. After controlling the endogeneity bias of remittances by using GMM estimation, our results suggest that the impact of remittances on economic growth depends on the level of financial development and the institutional environment. More precisely, a high level of financial development and a strong institutional environment are required to enable remittances to enhance growth.

[7] http://www.prsgroup.com/
[8] $-\beta 1/\beta 2 = -(-0{,}4352/0{,}1873) = 60$.

Appendix A

Table 1: Summary statistics

Variables	Mean	Std. dev.	Min	Max	Observations
GDP per capita growth	1.7950	7.9790	-64.99	53.932	373
Per capita income	2068.3	1866.1	188.62	10018	357
Investment	24.282	7.2448	2.9180	58.957	355
Human capital	75.515	18.640	39.450	118.77	396
Government spending	16.479	5.4915	2.3316	43.382	374
Population growth	2.3210	1.1951	-3.3394	7.1075	396
Openness	70.126	30.914	0.0209	154.23	374
Inflation	16.814	37.963	-16.117	448.5	340
Financial development 1	36.062	24.680	1.2660	99.203	333
Financial development 2	2.4974	0.9895	0.5662	7.5701	205
Financial development 3	2.4974	0.9895	0.5662	7.5701	205
Remittances	3.7842	0.2133	3.2665	4.3085	211
ICRG	34.273	28.138	0	75	207
ICRG 1	0.3976	4.3424	-26,455	9.3442	207
ICRG 2	0.0544	4.6485	-28,345	8.8654	205
ICRG 3	9.45454	3.4331	4.4245	19.3050	210
ICRG 4	8.8654	3.2631	4.8055	20.3050	215

Table 2: List of variables

Variable	Description and source
Growth	Real per capita growth (WDI-Word Bank)
Lagged GDP	Lagged real per capita income, expressed in log form. (WDI-Word Bank)
Remittances	Workers' remittances and compensation of employees, received (% of GDP) expressed in log-form (WDI-Word Bank)
Investment	Gross capital formation (% of GDP) expressed in log-form (WDI-Word Bank)
Inflation	Measured by CPI (annual %) (WDI-Word Bank)
Human capital	Age dependency ratio (% of working-age population) (WDI-Word Bank)
Government spending	General government final consumption expenditure (% of GDP) (WDI-Word Bank)
Population growth	Population growth (annual %) (WDI-Wolrd Bank)
Openness	The sum of exports and imports of goods and services as share of gross domestic product (GDP) in log form (WDI-Word Bank)
Financial development 1	Domestic credit to the private sector by banks as a percentage of GDP (WDI-Word Bank)
Financial development 2	The sum of currency and deposits in the central bank liquid liabilities divided by GDP (WDI-Word Bank)
Financial development 3	Bank's efficiency ratio is a measure of a bank's overhead as a percentage of its revenue (the sum of expenses (without interest expenses) divided by the revenue)
ICRG	ICRG political risk index (0 : highest risk, 100 : lower risk) (International Country Risk Guide, PRS Group)
ICRG 1	The sum of the subcomponents 'military in politics' and 'democratic accountability (International Country Risk Guide, PRS Group)
ICRG 2	The sum of corruption, law and order, and bureaucratic quality (International Country Risk Guide, PRS Group)
ICRG 3	The sum of government stability, socioeconomic conditions, and investment profile (International Country Risk Guide, PRS Group)
ICRG 4	Internal and external conflict, ethnic and religious tensions (International Country Risk Guide, PRS Group)

Appendix B

Figure 1: Marginal Effect of Remittances on Economic Growth based on each country's Financial Development index value

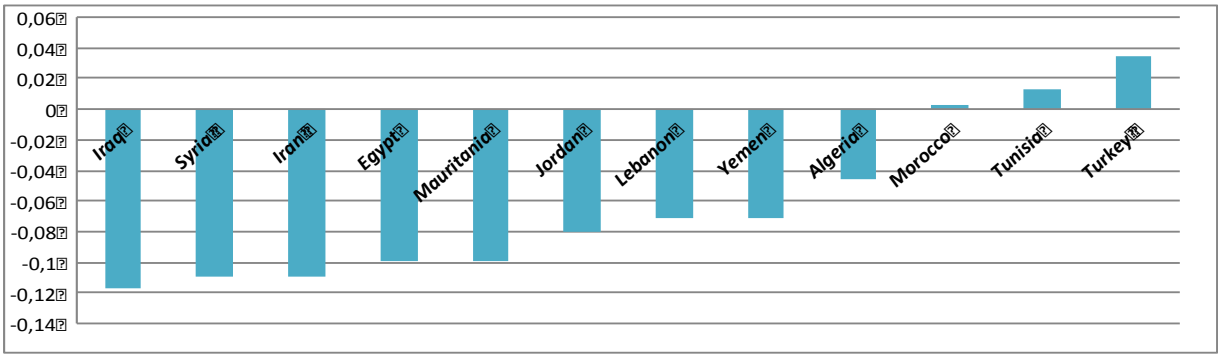
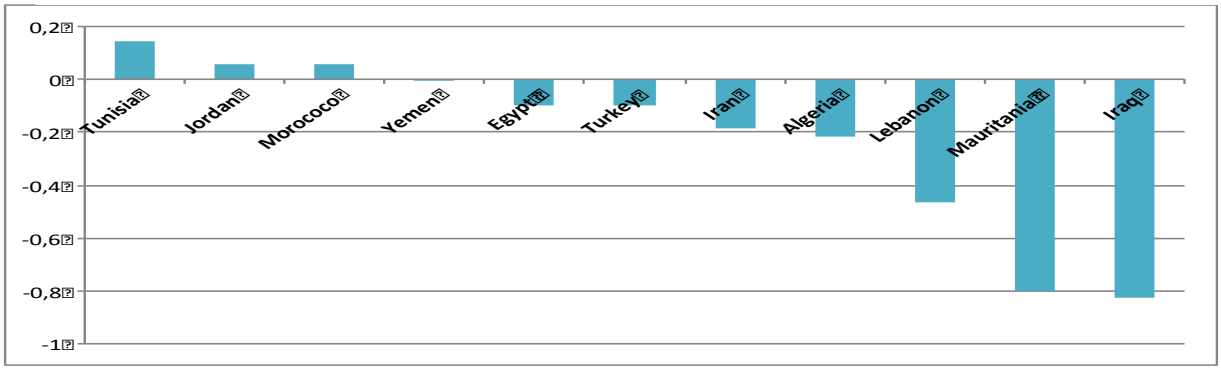


Figure 1: Marginal Effect of Remittances on Economic Growth based on each country's institutional index value



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