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Remittances, Financial Development, and Economic Growth in the Maghreb Countries

BY

Khalid Al-Senani[1], Zouheir Abida[2]

[1,2]University of Sfax, Faculty of Economics and Management of Sfax.

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Abstract

The study investigated the relationship among remittances, financial development, and economic growth in the Maghreb countries (Tunisia, Algeria, and Morocco) over the 2000-2021 period. Using system Generalized Method of Moment (GMM) panel data analysis, we find strong evidence of a positive relationship between remittances and economic growth. We also find evidence that remittances appear to be working as a complement to financial development and, moreover, that the effect of remittances is more pronounced in the presence of the financial development variable. The policy implications of this study appeared clear. Improvement efforts need to be driven by local-level reforms to ensure the development of domestic financial system in order to take advantage of remittances.

Keywords: *Remittances, Financial development, Economic growth.*

JEL Classification: *E21; F34; F21.*

1. Introduction

Remittances have become a major source of external financing for developing countries. Over the last several decades, the number of international migrations has increased dramatically, resulting in enormous cash flows to labor-exporting nations. The foreign remittances are of two types inward remittance and outward remittance. Outward remittance is the sending of the money outside the country where the paid worker is living in the domestic country. The sender can take the services of a bank or trade organization to send money oversees to the targeted nation however inward remittance is receiving of the cash payment from household living abroad. According to Meyer and Shera (2017), remittances, which account for around 27% of the gross domestic product of emerging economies, have been one of the most important sources of foreign capital inflows

In the extant literature, there is substantial disagreement as to what economic factors determine the inflow of remittances, as well as what impact, if any, these inflows have on economic growth. For example, Chami et al. (2005) found a negative relationship between remittances and economic growth. Basically, remittances were found to be counter-cyclical in nature. They argue that remittances act like compensatory transfers and, hence, do not aid in the process of economic growth. Their idea was that remittances are intended for consumption rather than investment. Hence, the impact of remittances on economic growth is insignificant. On the other hand, Giuliano and Ruiz-Arranz (2009) argue that remittances boost economic growth in countries with less developed financial systems by providing an alternative way to finance investment and helping overcome liquidity constraints.

In view of the growing economic importance of remittance inflows and the contradictory findings in the literature, this study estimates a dynamic panel model using the Arellano and Bover (1995) system GMM estimator and shows the effects of remittance inflows on the economic growth in the Maghreb countries (Tunisia, Algeria, and Morocco) over the 2000-2021 period. The paper also assesses the role of financial development in determining the relative effectiveness of remittance inflows to the region. The results suggest that remittances have a positive and significant effect on economic growth in the region and that the impact is more pronounced when financial development is included in the model. Thus, the findings reported in this study represent a significant contribution to the extant literature, particularly because they have been generated utilizing estimation techniques that address the inherent endogeneity of the included variables.

The paper is organized as follows. Section 2 reviews some of the voluminous extant literature. Section 3 describes the data and empirical methodology. The empirical results are presented in Section 4. The final section draws conclusions based on the results.

*Corresponding Author: **Zouheir Abida.**

2. Literature Review

2.1. Remittances and economic growth

The literature on remittances to developing countries has developed rapidly in recent years. Many empirical studies concentrate on the impact of remittance inflows on the living standards of recipient households. In this context, Abdih et al. (2012) showed that remittances help lift more people out of poverty by enabling them to consume more than they could otherwise. Remittances also tend to help the recipients maintain a higher level of consumption during economic adversity (Chami et al. 2012). Recent studies report that these inflows allow households to work less, take on risky projects they would avoid if they did not receive this additional source of income, or invest in the education and health care of the household. In other words, remittances are a boon for households. Others focus on the short-run macroeconomic impact of remittances, typically finding a positive relationship with aggregate income, investments, and employment (León-Ledesma and Piracha, 2001; Le, 2011; Dzansi, 2013).

As a consequence, these results say nothing definite on the effects of an increase in remittance inflows upon the economic growth of the receiving country in the long run, which largely depends on how such financial resources are used, whether directly by recipients or indirectly, through the intermediation of financial institutions, by other people in the country. If remittances are channeled into productive investment, or if they improve the creditworthiness of recipients and their access to external financial resources, the impact on economic growth is positive. If, however, the prevailing end uses of remittances are on increasing consumption and expenditures on housing, land and other forms of second-hand non-financial assets the association with the economic growth is very feeble - depending on the type of purchased goods and on the existence of unexploited national productive capacity. In addition, if we consider the wealth impact of remittances on the labor force participation of recipient households and the effects on the competitiveness of national exports, the relationship between remittances and GDP growth turns out to be negative.

In a study covering up to 113 countries over the period 1970 to 1998, Chami et al. (2005) found a negative link between remittances and economic growth. Basically, remittances were found to be counter-cyclical in nature. They argued that remittances act like compensatory transfers and, hence, do not aid in the process of economic growth. Their idea was that remittances are intended for consumption rather than investment. Hence, the impact of remittances on economic growth is insignificant. In this view, Barajas et al. (2011) showed how remittances can lead to real exchange rate appreciation, which in turn can make exports from remittance-receiving countries less competitive. The industries or companies that produce the exports may be transferring know-how to the rest of the economy or providing opportunities for other local companies to climb up the value chain. This is often the case, for example, with manufacturing. Therefore, if these companies become less competitive owing to exchange rate changes (which are themselves caused by remittances), then these firms must scale back or close, and their beneficial impact on productivity is reduced.

Given the contrasting channels through which remittances influence long-run economic growth, precisely what is the actual causal nexus between remittances and GDP growth is therefore a matter of empirics. The evidence is far from conclusive, results varying with time and the country sample analyzed, the definition of remittances used, the econometric specification and estimation methodology adopted. However, a stylized fact that seems to emerge is that on average the effect of remittance inflows on economic growth is small in magnitude and statistically not very robust with regard to both the sign and significance of the estimated coefficients.

An alternative instrument used in several subsequent studies is the distance between migrants' home country and their main destination country. This was used in a study by the IMF (2005), along with a dummy variable indicating whether the home and main destination country shared a common language over the 1980-2004 period. The IMF study was able to use time-invariant instruments because it employed a cross-section rather than an annual dataset on 101 countries over the period 1970-2003. The results yielded no statistical link between remittances and per capita output growth, or between remittances and other variables such as education or investment rates.

For his part, Faini (2006) used distance from the migrants' main destination countries as the instrument for remittances in cross-sectional growth regressions using a sample of 68 countries with data averaged over the 1980-2004 period. The coefficient on the remittance-to-GDP ratio in the growth regressions was positive but statistically insignificant. On the other hand, Acosta et al. (2008) found that remittances have a positive albeit modest influence on economic growth in a panel of 67 countries over the 1991-2005 period. These positive results were also confirmed through the studies on Latin American and Caribbean countries by Ramirez and Sharma (2008) and Mundaca (2009).

As for Barajas et al. (2009), they examined the impact of remittances on economic growth in 84 recipient countries, based on annual observations over the 1970-2004 period. They used the following instruments: the ratio of remittances to the GDP of all other recipient countries, which captures the effects of global reductions in transaction costs and other macroeconomic determinants of remittances. In most cases, remittances have a negative sign and, in others, there is no robust relationship between remittances and economic growth. However, Vargas-Silva et al. (2009) examined the impact of remittances on poverty and economic growth in Asia (using annual data). In their specification, GDP growth rate and poverty gap ratio are expressed as a function of remittances, logarithm of initial GDP per capita, primary school completion rate, logarithm of gross capital formation, openness of trade, and GDP deflator. While the impact of remittances on economic growth is positive, the impact on poverty is negative. In fact, using panel data from 1980-2004

*Corresponding Author: **Zouheir Abida.**

for 39 developing countries, Pradhan et al. (2008) confirmed that remittances have a positive impact on economic growth.

As for Giuliano and Ruiz-Arranz (2009), they studied the five-year growth of GDP of a set of 73 developing countries in the 1975-2002 period and showed that, on average, remittances have no significant influence on economic growth. For his part, Jongwanich (2007) examined the effects of migrant remittances on economic growth in developing Asia-Pacific countries using panel data over the 1993-203 period. They suggested that the correlation between remittances and the three-year growth rate of GDP is statistically insignificant.

For their part, Ramirez and Sharma (2008) found that remittances have a positive and significant effect on economic growth of selected upper and lower-income Latin American and Caribbean countries. As for Fayissa and Nsiah (2010), they explored the aggregate impact of remittances on economic growth within the conventional neoclassical growth framework using panel data spanning from 1980 to 2004 for 36 African countries. They found that remittances positively impact economic growth by providing an alternative way to finance investment and helping to overcome liquidity constraints. Also, Nyamongo et al. (2012) confirmed that remittances appear to be an important source of economic growth in a panel of 36 countries in Africa over the 1980-2009 period. Similar results are reported by Nsiah and Fayissa (2013), who found that remittances had a positive and significant effect on economic growth in Africa, Asia, and Latin American-Caribbean countries over the 1985-2007 period. Applying monthly data for the years 2009 (01) through 2016 (06), Kruah (2017) evaluated the connection between remittance inflows into Liberia and the growth rate of its economy. He found that the economic growth of the nation's economy was positively impacted by the receipt of remittances from overseas.

On the other hand, by analysing the impact of remittances on economic growth in African countries over the 1980-2006 period, Oumansour et al. (2019) managed to show that in a sample of 34 African countries, remittances have a significant and positive effect on economic growth. Similarly, Ekanayake and Moslares (2020) documented a positive long-run effect of remittance on economic growth and poverty in 21 countries of Latin America. For their part, Depken et al. (2021) evaluated the causal association between foreign remittance and economic growth in Croatia. They revealed a one-directional causal relationship running from remittances to economic growth. As for Islam (2022), he studied the growth impact of remittances for a duration spanning from 1986 to 2019 on some selected Asian economies. He found that remittances were reported to have a beneficial impact on economic growth. More recently, using data from a sample of six countries belonging to the Central African Economic and Monetary Community zone, over the 1990-2018 period, Tchekoumi and Nya (2023) found that remittances have a positive and significant impact on economic growth. They also suggested that the non-linear relationship between remittances and economic growth depends mainly on trade openness, private investment, and political stability.

2.2. Interactions between remittances and finance in promoting growth

Current discussions on the relation between remittances and financial development are based on the question whether these two variables are substitutes or complements. On the one hand, the complementarity hypothesis claims that remittances and financial development foster one another. While a higher degree of financial development allows migrants to send money home faster, safer, and above all cheaper, large amounts of remittances stimulate the interest of financial institutions and public authorities, bringing about higher levels of competition between financial intermediaries, as well as institutional reforms aiming at channeling remittances towards productive investment. In addition, a more developed financial system in the home country should entail lower costs of transferring money (Freund and Spatafora, 2008): these would reduce the number of households who are prevented from remitting by a budget constraint and increase the optimal amount transferred by each remitter. Finally, in countries where the banking system is well developed, remittances may complement bank credit or may act as collateral to gain access to it. Migrants might then be encouraged to transfer money to their families in the hope that it will not be wasted in unproductive consumption (Chami et al. 2005).

On the other hand, a substitution mechanism could also be at work: when domestic credit markets are poorly developed, a large number of households with potentially productive investment projects have no access to external finance or may borrow only at a large premium over the risk-adjusted interest rate. In this case, remittances may be used as an alternative source of finance allowing recipient households to fund productive activities, or may be pledged as collateral, helping recipients to access formal credit markets. Alternatively, they may be intermediated directly by recipients, enabling other village households to overcome credit constraints and start new businesses (Bettin and Zazzaro, 2012).

The empirical literature on the relationship between remittances and financial development tests two hypotheses; the substitutability hypothesis on the one hand, and the complementarity hypothesis, on the other. Substitutability between remittances and finance appears to be robust to the sample of countries analyzed and the econometric method employed. For example, Giuliano and Ruiz-Arranz (2009) used a cross-section of 73 countries over the 1975-2002 period to test the substitutability hypothesis. They contended that formal credit and remittances are substitute rather than complement; remittances substitute for the lack of finance, which implies that their impact on economic growth is more pronounced whenever finance is missing. They interpret this finding to suggest that in shallow financial markets where potential investor lack collateral and face credit constraint remittances support entrepreneurial activities, conversely in developed markets entrepreneurs can access credit through formal channels. In a related study, Ramirez and Sharma

*Corresponding Author: **Zouheir Abida.**

(2008) showed that remittance inflows have a positive and significant impact on economic growth in the selected Latin American and Caribbean countries over the 1990-2005 period and that the effect of remittances is more pronounced in less financially developed countries. As for Calderon et al. (2008), they found additional support for this hypothesis of substitutability for which the promoting effect of remittances on the investments and economic development of the receiving country declines as the domestic financial sector becomes deeper. Similar results are reported by Barajas et al. (2009), who pointed out a larger set of countries by using fixed-effect methods, and by Le (2011), who focused on the impact of remittances on investments.

The complementarity relationship between remittances and financial development in boosting economic growth is found by Mundaca (2009). Using the panel data of 25 Latin American and Caribbean countries from period 1970 to 2002, he showed that remittances can further promote GDP growth in economies with well-developed financial systems. This is confirmed in a study by Aggarwal et al. (2011) using data on remittance inflows for 109 developing countries over the 1975-2007 period, which revealed the existence of a positive and significant link between remittances and financial sector development. This is premised on the notion that remittances contribute to the development of the financial sector by increasing the aggregate level of deposits and/or the amount of credit to the private sector extended by the local banking sector. Providing remittances, services allow banks to "get to know" and reach out to unbanked recipients or recipients with limited financial intermediation. If this argument is valid, financial development will in turn promote economic growth as shown in the literature (see Misati and Nyamongo, 2011). Similarly, using a panel of 66 developing countries over the 1991-2005 period, Bettin and Zazzaro (2012) showed that an efficient banking system complements the positive effect of remittances on GDP growth. Similar results are reported by Nyamongoa et al. (2012), who found that remittances appear to be working as a complement to financial development in a panel of 36 countries in Africa over the 1980-2009 period.

For his part, Sobiech (2015) explored the growth impact of remittances of 54 developing nations over the 1970-2010 period. They revealed that for countries with underdeveloped financial sector, remittances are found to negatively affect its economic growth. In fact, using a sample of 49 developing countries over the 2001-2013 period, Eggoh et al. (2019) found that remittances have a significant positive impact on economic growth. Moreover, they established that this impact depends mainly on the level of financial development and investment, and less on the level of consumption and remittances themselves. On the other hand, Olayungbo and Quadri (2019) investigated the relationship among remittances, financial development, and economic growth in a panel of 20 sub-Saharan African countries over the 2000-2015 period. They found that remittances and financial development were found to have positive effects on economic growth both in the short and the long run. They also showed that financial development acted as a substitute in the remittances-growth relationship.

For their part, Rehman et al. (2021) investigated the impact of remittances and financial development on economic growth in six Western Balkan countries over the 2000-2017 period. They found that financial development and remittances impact positively economic growth. More recently, Dada and Akinlo (2023), showed that financial development and remittances contribute positively to economic growth in Nigeria over the 1986-2017 period. They also pointed out that financial development and remittances perform a complementary role in influencing economic growth in the long run.

3. Data and Empirical Methodology

3.1. Data

This section describes the data used in the empirical analysis, specifically the measures of remittances, financial market development, economic growth, and a number of controlling variables used in growth regressions. Our sample consists of 3 Maghreb countries (Tunisia, Algeria, and Morocco) with annual data for the 2000-2021 period.

The dependent variable is the real GDP per capita growth. This variable is obtained directly from the World Bank: World Development indicators (2024). In addition, the real GDP per capita used here is in US dollars (2015 prices). The key variable of interest (remittances) and the additional control variables are obtained from the World Development Indicators database (World Bank, 2024).

The broader measure records remittances as the sum of three aggregates: First, *workers' remittances* record current transfers to nonresidents by migrants who are employed in, and considered a resident of, the countries that host them. The category *employee compensation* is composed of wages, salaries, and other benefits earned by individuals in countries other than those in which they are residents for work performed for and paid for by residents of those countries. Finally, *migrants' transfers* are contra-entries to the flow of goods and changes in financial items that arise from individuals' change of residence from one country to another, such as movement of accumulated savings when a migrant returns permanently to the home country. In most research on remittances, all three types of transfers are summed and labeled "remittances".

In this study, we use domestic credit to private sector provided by the banking sector to GDP (FD). According to Calderon and Liu (2003), this indicator separates credits issued to the private sector, as opposed to credits issued to the public sector, and it also eliminates credits delivered by the central bank. Consequently, this indicator is more directly associated to investment and economic growth. E higher domestic credit to private sector indicates a greater number of financial services and therefore a greater development of financial intermediaries.

- Initial GDP per capita (log): log of real GDP per capita. A negative coefficient is expected, signifying

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the existence of conditional convergence (La Porta et al., 1998).

- The rate of inflation: Consumer price index growth measures the annual percentage change in the consumer price index to determine the inflation rate. This rate reflects the change experienced by the prices paid by the average consumer during a given period when purchasing goods and services. A negative coefficient is expected, as high inflation can contribute to deteriorating price competitiveness leading to negative effects of the external sector on economic growth (Elder, 2004)
- Government size is approximated in terms of public spending as a proportion of GDP. Public spending can stimulate economic growth, by increasing the marginal productivity of public and private factors of production. Public spending on research and development, for example, can improve the levels of production. This result is consistent with the study of Poku et al. (2022).

3.2. Empirical Methodology

Here we explain the estimation strategy used in this paper. As a starting point we formulate the standard growth model in a manner consistent with Olayungbo and Quadri (2019). We estimate the impact of remittances on economic growth by system GMM. For illustrative purposes, we do not include in our first regression any variable for financial development. We estimate the following equation:

$$GDP_{i,t}=\beta_0+\beta_1 GDP_{i,t-1}+\beta_2 \mathrm{Re}m_{i,t}+\beta_3 X_{i,t}+\mu_t+\eta_i+\varepsilon_{i,t} \quad (1)$$

where $GDP_{i,t-1}$ denotes the (logarithm of) initial level of GDP per capita, Rem is equal to remittances over GDP and $X_{i,t}$ is a vector of variables found in standard growth models including: inflation rate and ratio of government consumption to GDP, μ_t is a time specific effect, η_i is an unobserved country-specific fixed effect and $\varepsilon_{i,t}$ is the error term.[1] We are interested in testing whether the marginal impact of remittances on growth, β_2, is statistically significant.

While remittances have the potential to affect economic activity through a host of channels, we examine one specific link between remittances and economic growth, specifically the one working through financial markets. The hypothesis we would like to test is whether the level of financial development in the recipient country affects the impact of remittances on economic growth. To this end, we interact the remittances variable with an indicator of financial development and test for the significance of the interacted coefficient. A negative coefficient would indicate that remittances are more effective in boosting economic growth in countries with shallower financial systems. In other words, a negative interaction provides evidence of substitutability between remittances and financial development. On the other hand, a positive interaction would imply that the growth effects of remittances are enhanced in deeper financial systems, supporting complementarity of remittances and other financial flows.

The regression to be estimated is the following:

$$GDP_{i,t}=\beta_0+\beta_1 GDP_{i,t-1}+\beta_2 \mathrm{Re}m_{i,t}+\beta_3 FinDev_{i,t}+\beta_4(\mathrm{Re}m_{i,t}.FinDev_{i,t})+\beta_5 X_{i,t}+\mu_t+\eta_i+\varepsilon_{i,t} \quad (2)$$

where FinDev is a set of financial development indicators and Rem.FinDev is an interaction variable. As shown in Eq. (1) remittances are critical to economic growth performance. Here we hypothesize that higher level of remittances will influence on economic growth. This follows the work of Giuliano and Ruiz-Arranz (2009) and Rao and Hassan (2011). Further motivation is found in Aggarwal et al. (2011) where it is shown that remittances may directly promote financial development which will in turn positively impact the level of economic growth.

In Eq. (2) the interaction term (Rem.FinDev) is incorporated. This variable serves to show the role of remittances on economic growth using the financial sector transmission mechanism. The inclusion of the interaction term in this equation is based on the debate in the literature on whether these two variables are complements or substitutes. The proponents of the substitutability hypothesis argue that remittances relax the lack of financial development condition in emigration countries, by allowing poor people to invest in high-return projects despite their difficulties to obtain credit (see Calderon, et al. 2008; Giuliano and Ruiz-Arranz, 2009). On the other hand, the complementarity hypothesis is built on the notion that remittances and financial development support one another (see Aggarwal et al. 2011; Bettin and Zazzaro, 2012). Here it is shown that a higher degree of financial development allows migrants to send money home cheaply, faster, and safely. If remittances are transmitted in large amounts, they may stimulate the interest of financial institutions and public authorities, bringing about higher levels of competition between financial institutions, as well as institutional reforms with a view to channeling remittances towards productive investment.

Our estimation technique addresses issues of endogeneity and unobserved country characteristics. Therefore, to account for endogeneity and country-specific unobserved characteristics, we use the system GMM dynamic panel estimation method. The option to use system GMM is based on the argument that the existence of weak instruments implies asymptotically that the variance of the coefficient increases and in small samples, the coefficients can be biased. To reduce the potential bias and inaccuracy associated with the use of Difference GMM (Arellano and Bond, 1991), Arellano and Bover (1995) and Blundell and Bond (1998) develop a system of regressions in differences and levels. The instruments for the regression in differences are the lagged levels of the explanatory variables and the instruments for the regression in levels are the lagged

[1] Note that Eq. (1) can be alternatively written with the growth rate as dependent variable as:

$$Growth_{i,t}=GDP_{i,t}-GDP_{i,t-1}=\beta_0+(\beta_1-1)GDP_{i,t-1}+\beta_2 \mathrm{Re}m_{i,t}+\beta_3 X_{i,t}+\mu_t+\eta_i+\varepsilon_{i,t},$$

where (β_1-1) is the convergence coefficient.

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differences of explanatory variables. These are considered as appropriate instruments under the assumption that although there may be correlation between the levels of explanatory variables and the country-specific effect, there is no correlation between those variables in differences and the country specific effect.

The consistency of the system GMM estimator is assessed by two specification tests. The Sargan test of over-identifying restrictions tests the overall validity of the instruments. Failure to reject the null hypothesis gives support to the model. The second test examines the null hypothesis that the error term is not serially correlated. Again, failure to reject the null hypothesis gives support to the model.

4. Empirical results

To study the role of remittances, financial development, and economic growth, we estimate the growth model following the standard variables as shown in Table (1). The results suggest that the main variable of interest, migrant remittances to GDP are positive and statistically significant, suggesting that remittances contribute significantly to economic growth in the Maghreb countries. However, the results suggests that a 1% increase in remittances leads to a 0.03% increase in the growth rate. This conclusion is also consistent with previous empirical studies such as Aggarwal et al. (2011) and Ramirez (2013).

The results also show that the estimated coefficient on financial development is statistically significant at 5% level, which suggests that financial development plays a positive role in promoting economic growth in the North African countries. However, the results shows that a 1% increase in financial development leads to a 0.026% increase in the growth rate. This result is in contrast to previous results by Choong (2012) and Law et al. (2013).

In this study, we also explore whether the financial development of the recipient country influences the specific uses given to remittances and their capacity to influence growth. The sign of the interacted coefficient provides information regarding the nature of remittances. More specifically, a positive interaction term reveals that they are complementary and that a well-functioning financial system enhances the impact of remittances. On the other hand, a negative sign indicates that remittances and financial development are used as substitutes to promote economic growth. Table (1) present system GMM estimates using domestic credit as ratio of GDP as a measure of financial development.

Table (1) presents the results where the interaction variable the regressions. As shown in the coefficients on remittances*financial development is positive and statistically significant, confirming the results that remittances contribute to an increase in economic growth through its interaction with financial sector development. This finding supports the complementarity hypothesis and corroborates the findings by Mundaca (2005); Bettin and Zazzaro (2012) and Nyamongo et al. (2012). However, our findings suggest that public authorities in today's North African countries should try to maximize the impact of remittances by identifying policies aiming to promote financial democracy, that is, policies that facilitate the access to bank service, that provide information about the remittance market, and that ensure greater transparency in the financial system. In so far as financial development has positive impacts on economic growth, such policies should also contribute to accelerate the process of catching-up in real income of emigration countries.

Table 1. The growth effect of remittances and financial development

Variable	
Initial GDP per capita	-0.951***
	(0.004)
Remittances	0.03**
	(0.012)
Financial development	0.026**
	(0.017)
Remittances*Financial development	0.008*
	(0.061)
Inflation	-0.019**
	(0.017)
Government spending	0.181*
	(0.071)
Constant	0.203***
	(0.001)
AR(2) test (p-value)	0.591
Hansen-J-Test (p-value)	0.357

Notes: The dependent variable is real GDP growth. Annual data from 2000–2021. Robust standard errors are in parentheses below the coefficients. *p < 0,1; **p < 0,05; ***p < 0,01.

We introduce the level of initial GDP per capita (the natural logarithm) as independent variable according to the conditional convergence hypothesis. The initial GDP per capita coefficient is negative, meaning that the conditional convergence hypothesis is evidenced: holding constant other growth determinants, countries with lower GDP per capita tend to grow faster. The initial position of the economy is thus a significant determinant of economic growth, as recognized by the neoclassical theory. The initial income has a negative effect on economic growth coherent to the theoretical study and statistically significant at a 1% level. The result corroborates the work of Barro and Sala-i-Martin (1997) and Sachs and Warner (1997). With regards to the effect of the other variables in the regression, they are all consistent with

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standard growth regression results. The inflation rate coefficient carries a negative sign and therefore, it is statistically significant at conventional levels implying that a high inflation rate will have a negative influence on economic growth. Therefore, this result corroborates the work of Aydin et al. (2016). As for the estimate of government expenditure, it is statistically significant and has a positive effect on the economic growth of the entire sample. The *p* values for the Sargan test for over-identifying restrictions where the null hypothesis is that the instruments are uncorrelated with the residuals, and the Arellano-Bond test for second-order serial correlation in the first-differenced residuals, confirm that the moment conditions cannot be rejected.

5. Conclusions

Our study examines the relationship between remittances and economic growth in the presence of domestic financial system. Using system GMM panel data model to examine the link between remittances, financial development, and economic growth in the Maghreb countries (Tunisia, Algeria, and Morocco) over the 2000-2021 period, both remittances and financial development indicators generally show a significant and positive impact on economic growth.

To examine whether financial development helps a country to benefit more from remittances, the study interacted remittances with different measures of financial market development. The result is that when remittances is interacted with the financial development indicators, the interaction terms are generally positive and significant, shedding light on the role of financial development in benefiting from remittances. The results have clear policy implications, namely the effect of remittances on economic growth is subject to the underlying financial conditions and institutions. A well-developed domestic financial system plays an important role in complementing the impact of remittances on economic growth; that is, countries with better-developed financial sectors experience a raise in their growth rates.

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*Corresponding Author: **Zouheir Abida.**