

## Inflow Remittances and Economic Growth: An Empirical Study of Jordan

*Sohail I. Magableh*<sup>1</sup>

### ABSTRACT

The objective of this paper is to investigate the effects of remittances inflow on real GDP growth in Jordan during the period 1976-2013. Data from World Bank and Central Bank of Jordan spanning the period of the study is used. Vector Error Correction Model (VECM) is employed in the analysis. The main findings are follows, analysis reveals a positive long-run (or equilibrium) relationship between economic growth, and each of capital, labor, and remittances in Jordan. In the short run, capital accumulation and labor compensations show no statistical significant association with real GDP growth, whereas remittances show negative impact on GDP growth. The error correction term that measures the speed of adjustment toward equilibrium is found negative in sign and statistically significant, where GDP growth corrects the short-run disequilibrium by 2.6% a year.

**Keywords:** Remittances, Real GDP growth, VECM, Jordan.

### INTRODUCTION

Workers' remittances are defined as a portion of income that migrants earn abroad and then send them home to their families. Remittances during the last few decades played an increasingly critical role in the developing countries because they currently represent a substantial source of revenue for many of these countries. Recently, World Bank (2014) indicates that recorded 75% of the international remittances, with a growth of 5% compared to 2013, and remittances were more than three times the size of total official development assistance funds (ODA). For many developing countries, remittances represent a major source of international capital flows, exceeding foreign

aid, foreign direct investment (FDI), and export revenues (Nsiah and Fayissa, 2013).

Like many developing countries in MENA, Jordan is characterized with high migration, and hence with high remittances. This can be explained by paramount challenges that historically facing Jordanian economy of which; high unemployment rate; high dependency on foreign aid and remittances; high energy import dependency; and high dependency on domestic and foreign debts. Recently, Jordan is suffering from additional pressure on infrastructure, healthcare, education, and water resources mainly due to the political instability in Syria and its escalating direct and indirect inverse impacts from the ongoing Syrian conflict that started in 2011. Jordan is struggling to deal with the massive influx of Syrian refugees (600,000) as reported by Migration and Development Brief (2014), in addition to the Syrian non refugees.

The economic thought suggests that remittance inflows are a significant external source of income for receiving economies especially for a country like Jordan,

---

<sup>1</sup> Assistant Professor, Department of Economics, Yarmouk University, Jordan.

✉ smagableh@yu.edu.jo

Received on 14/10/2015 and Accepted for Publication on 21/2/2016.

through finance some developmental projects, reducing its exposure to sharp fluctuations, and hence promoting economic growth. Therefore, the research problem of the article lies in the search for whether remittances have considerable economic effects in Jordan. In other words, the study endeavors to figure out to what extent remittances inflows are important for the Jordanian economy during the period (1976-2013)?

This study stems its importance from being a recent study on inflow remittances and economic growth in Jordan, other studies have been conducted on Jordan link remittances with other variables such as labor force, real exchange rate, and macroeconomic policy. The study also stems its importance from the increased attention paid by the government to promoting remittances due to their importance to Jordanian economy as a major source of capital inflows given the decline of some other foreign capital inflows such as foreign direct investment. Hence, the analysis of remittances and their economic impacts in Jordan may contribute to designing policy to the decision-makers in order to promote remittances inflows, or it may provide them with a better and more realistic understanding on how to consider or reconsider their views towards remittances and their potential effects on the basis of analysis. Therefore, this study seeks to answer the following important question: do workers' remittances promote economic growth in Jordan?

The paper is organized as follows. The next section provides a review of the literature. Section 3 describes the economic growth and remittances in Jordan. The model and data are discussed in section 4. The empirical results are presented in Section 5. The final section draws conclusions based on the results. An appendix is included at the end of the study.

## 2. Literature Review

A massive published economic literature has been carried out in developing countries to analyze

remittances in order to figure out their possible impacts on economic growth [Barajas *et al.*, 2009; Mim and Ali, 2012; Yaseen, 2012; Barguelli *et al.*, 2013]. Other research line investigated the macroeconomic determinants of remittances [Lucas and Stark, 1985; Elbadawi and Rocha, 1992; El-Sakka and MaNabb, 1999; Mouhoud, *et al.*, 2008; Adams, 2008; Buch and Kuckulenz, 2009; Khan and Shah, 2012; Al-Assaf and Al-Malki (2014)].

Generally, the economic literature suggests that remittance inflows have become a significant source of income and external finance for receiving economies especially in the developing countries. The literature has documented a number of positive contributions of remittances to economic development in recipient countries through reducing poverty, finance education, health expenditures, facilitating investment, promoting employment, and promoting economic growth (Glytsos, 1993; Ratha, 2006; Taghavi, 2012; Benmamoun and Lehnert, 2013).

Remittances may stimulate investment indirectly, as consumption that funded by remittances promotes demand for products and creates jobs because it leads to significantly higher levels of employment with a multiplier effect (Stahl and Arnold, 1986), and this implies that economic activity is stimulated both directly and indirectly by remittances, and that it leads to significantly higher levels of employment, investment, and hence income within a specific region or a country. However, the positive effect of remittances on investment or on economic growth is likely to be larger for countries where the financial system is relatively underdeveloped, remittances could foster investment by reducing the volatility of consumption and contributing to a more stable macroeconomic environment (Singh *et al.*, 2010). Moreover, the study of 76 developing countries by Adams (2008) concludes that the level of per capita remittances received by a country is positively related to investment returns at home.

Generally, the literature suggests that remittance flows improve alleviate pressures on external borrowing and an improved standard of living, Ratha (2006) shows that remittances generate substantial welfare gains and reduces poverty. However, the economic impacts of remittances depend to a large extent on the purpose of using them in the home countries such as investment, consumption, or education for instance (Mouhoud *et al.*, 2008). Worker remittances also improve balance of payments of the recipient country and the welfare of emigrants and their families (Samuel and George, 2002), also Mundaca (2009) indicates that financial intermediation tends to increase the responsiveness of growth to remittances.

In spite of remittances have a critical economic importance in some areas, they may have negative implications in terms of inflation, interest rates, brain drain for some high qualified migrants, and trade deficit. Remittances also can reduce labor market participation rates as receiving households depend entirely on their living on remittances rather than by working. In addition, some literature argues that the impact of remittances on the receiving economy in the long run leads to negative economic growth (McCormick and Wahba, 2000; Chami *et al.*, 2003). Ratha (2006) indicates that remittances may lead to currency appreciation and adverse effects on exports, create dependency, and their channels may be misused for financing terrorism or money laundering. In other words, until recently, the potential effects of remittances receipts on macroeconomic performance were inconclusive and a subject of debate. This implies that the impact of remittances on economic growth was positive, negative, or even non-existent, in statistical terms [Russell, 1986; Lucas, 2005; Barajas *et al.*, 2009].

Barajas *et al.* (2009) indicate that workers' remittances have grown to become one of the major sources of financial flows to 84 developing countries, the results suggest that decades of remittances have

contributed little to economic growth in remittance-receiving economies and may have even retarded growth in some countries.

Yaseen (2012) analyzes the impacts of remittances on economic growth in MENA countries, the results show that institutions and financial development play an important role in how remittances affect economic growth. Moreover, the study indicates that a larger contribution of remittances to output growth comes through funding consumption demand, reduced pressures on the current account, contributing to national savings, and funding domestic investment. Mim and Ali (2012) analyse the relationship between remittances and growth in MENA region also, where the outcomes show that the most important part of remittances is consumed, and remittances can spur growth by encouraging human capital accumulation.

Meanwhile, many studies have been carried out to identify the impact of remittances on economic growth internationally; there has been little research on the impact of remittances on economic growth in Jordan in particular during the last decades. Some of these studies analyzed the impact of remittances on labor supply (Emilsson, 2011). Others investigated the relationship between remittances and real exchange rate (Saadi-Sedik and Petri, 2006). Al-Assaf and Al-Malki (2014) also estimate the main macroeconomic factors that affect workers' remittances, the main results confirm that remittances are most likely to be influenced by external factors rather than internal ones.

A few recent research has studied this area of interest; of which El-Sakka (2007) evaluates the impact of macroeconomic policy on the inflow of remittances, Al Akayleh (2011) also discusses the effect of remittances on economic activity through its main components, the results show that inflow remittances have positive and significant impacts on GDP, the results also show the same results on consumption, investment, government expenditure, but a negative

impact on net exports. Other study by Awad (2012) discusses the main determinants of economic growth in Jordan, the results show that worker remittances along with other factors such as external trade and FDI inflows contribute significantly to economic growth. The most recent study in Jordan is carried out by Assaf (2015) which highlights the effect of remittances on economic growth, the results indicate that there is a positive effect of remittances on GDP.

### 3. Economic Growth and Remittances in Jordan

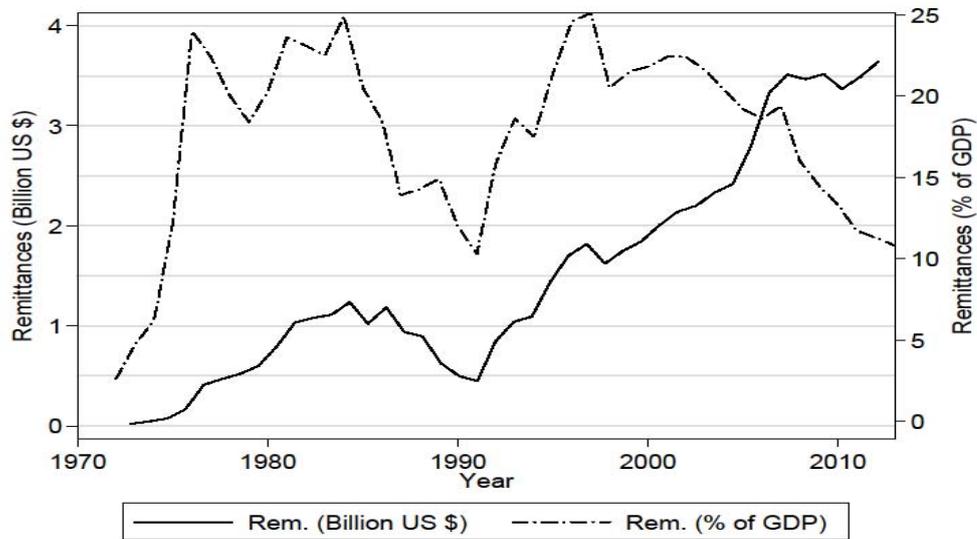
Remittances to Jordan are a pillar of economic prosperity and normally have been a major source of foreign currencies reserves. The Center for Strategic Studies (2012) refers that remittances represent relatively a major stable source of international capital flows, compared to foreign aid and foreign direct investment. Mohaddes and Raissi (2011) confirm empirically that a large share of Jordan's output volatility can be associated with fluctuations in net income received from abroad, where remittances are the main source of the net income. Also, Central Bank of Jordan (CBJ) (2014) indicates that the percentage of remittances to domestic exports was 47 percent in 2012. Therefore, the government of Jordan has recognized the economic importance of remittances. For this reason, a few measures have been adopted by the Government to promote remittances flows in order to facilitate on its official employees to work abroad especially in the Arab Gulf States. Among these facilities for instance; an official leave up to ten years has been given to the public officials according to the regulations of the Civil Service Bureau, in addition to some memorandums of understanding and bilateral agreements between the governments of Gulf countries and the government of Jordan so that Jordan provide them with highly-skilled employees.

Moreover, recently, in 2013 the Government changed the name of the Ministry of Foreign Affairs to become Ministry of Foreign Affairs and Expatriates in

order to reflect the increasing official attention to the importance of Jordanians citizens abroad and their considerable economic and social roles back home. In this context, the Ministry held the Jordanian Expatriates Conference in July 2015, one of its objectives was to facilitate the contribution of the Jordanian expatriates to the Jordanian economy.

Migration Policy Institute (MPI) (2014) indicates that Jordan in 2012 ranks as the 18<sup>th</sup> recipient of remittances accounted for 11.4% of Gross Domestic Product (GDP) (3.6 billion USD in 2012), compared to 22% and the 4<sup>th</sup> rank in 2000. The total remittances inflows to Jordan started to be around \$411 million in the first year of the study period 1976, and fluctuated up and down ranging from \$411 million in 1976 to \$3643 million in 2008 with an average 6.2 percent annual growth rate. The remarkable drop of remittances to Jordan in 1990 and 1991 in terms of volumes and as a percentage of GDP, was due to the 250,000 to 330,000 Jordanians and Palestinians who directly returned back to Jordan from Kuwait as a result of Iraqi invasion in August 1990 [Glytsos, 1993; Swaidan and Nica, 2002]. The remittances have doubled between 2000 (\$1800 million) and 2012 (\$3600 million).

Figure (1) shows the evolution of remittances as volumes and as a percentage of Gross Domestic Product (GDP) during the period (1976-2014) according to the World Bank's database. In theory, remittances facilitate GDP growth because they serve as an important source of revenue for large number of households in developing countries, remittances are used primary for daily expenses, home construction, real estate purchase, medical care, and education. A part of remittances is saved or possibly invested. Therefore, as remittances as a percentage of GDP increases, GDP growth increases as well, as long as many uses of remittances form a part of aggregate demand.



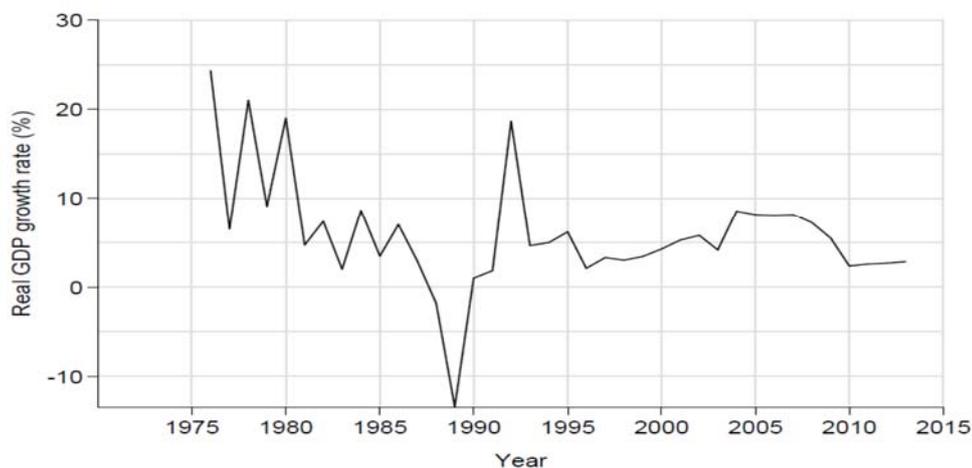
**Figure 1: Remittances Inflow and its Share of GDP (1976-2013)**

Source: World Bank, World Development Indicators.

The gradual return during the 2<sup>nd</sup> half of 1980s as a consequence of the progressive replacement of Arab by Asian workers in the Gulf countries explains the reduction in both volume of remittances and their relative importance to GDP. Also, Figure 1 shows that after 2008, the remittances declined up to 2011, and then slightly started to increase in 2012 and beyond, but they declining as a percentage of GDP after 2008 resulting from the global financial crisis and instability in the region due to Arab spring events. Other fluctuations could be attributed to the oil prices fluctuations given that most of remittances originating from the Arab Gulf Countries which represent today the most important destination for Jordanians.

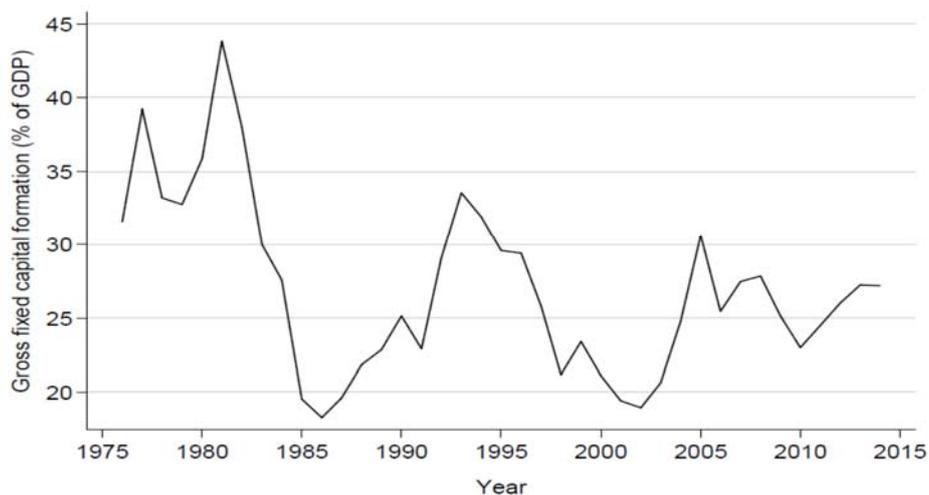
The percentage of remittances to GDP also is volatile and characterized by a number of peaks and troughs; the deepest trough was in 1991 (10.7 percent), while the

highest peak percent was in 1997 (25.1 percent). The second highest peak was in 1984 (24 percent), while the second lowest trough occurred recently in 2012 (11.4 percent), the average over the period was approximately 19 percent. On the other hand, as shown in Figure 2 and Figure 3, the real GDP growth rate and gross fixed capital formation (GFCF) as a percentage to GDP also are volatile and characterized by a number of peaks and troughs; the lowest growth rate of real GDP was in 1989 due to the major macroeconomic imbalances peaked in this year (-13 percent), while the highest peak percent was in 1976 (24 percent). The second highest peak in 1990s was in 1992 (18 percent), while the GFCF as a percentage to GDP reached the minimum value in 1986 and 2002, while the highest peak was in 1982 (44 percent).



**Figure 2: Real GDP Growth Rate (%) (1976-2013)**

Source: World Bank, World Development Indicators.



**Figure 3: GFCF as a Percentage to GDP (%) (1976-2013)**

Source: World Bank, World Development Indicators.

**4. The Model and Data**

**4.1 Data**

This study employs data from the World Bank and the Central Bank of Jordan (CBJ). More specific, real GDP data, capital formation data, and remittances data are taken from world development indicators (WDI), a publication of the World Bank. Compensations of labor data, on the other hand, are taken from the database of

the Central Bank of Jordan (CBJ). All data series are annual and spanning the period 1976-2013. Formal remittances have only been considered in the analysis, and hence, remittances through informal channels such as money carried by family members or friends, or in-kind remittances such as cars and furniture are not included in the analysis.

The Descriptive statistics of the above variables as

shown in Table 1 (in Appendix A) are as follows; the value of real GDP during the study period ranges from approximately \$2750 million (the minimum value) to 18445 (the maximum value) with an average of \$8937 million. While real fixed capital ranges from \$1013 million to 5047 million with an average of \$2587 million. The average of labor compensation is \$3724 million, and it ranges from \$630 million to \$12231 million. Remittances are already discussed in more details earlier in this section.

#### 4.2 The Model

In order to explore the relationship between remittances and economic growth in Jordan, remittances inflow is introduced into the traditional production function. That is, capital accumulations and labor compensations, in addition to workers' remittances are the main forces that stimulate economic growth in Jordan. The model can be written as follows:

$$Y = f(K, L, rem) \quad (1)$$

Where the dependent variable Y denotes real GDP growth measured as natural logarithm of real GDP, K is the GFCF measured as a percentage of GDP, L is labor force proxied by compensations of employees as a percentage of GDP, and *rem* represents personal remittances received measured as a percentage of GDP. Semi-log model is used to express the long run

$$\Delta \ln gdp_t = \beta_0 + \beta_1 \Delta \ln gdp_{t-1} + \beta_2 \Delta K_{t-1} + \beta_3 \Delta L_{t-1} + \beta_4 \Delta rem_{t-1} + \beta_5 ECT_{t-1} + \varepsilon_t \quad (3)$$

Where,  $\Delta$  is the difference operator,  $\beta_i$  measures the short-run effect of growth determinant  $i$ , and  $\varepsilon_t$  is the

$$ECT_{t-1} = \ln gdp_{t-1} - \alpha_0 - \alpha_1 K_{t-1} - \alpha_2 L_{t-1} - \alpha_3 rem_{t-1} \quad (3.a)$$

is the one-lag time period error correction term that represents the speed of adjustment toward equilibrium.

relationship between economic growth and the three determinants of growth according to:

$$\ln gdp_t = \alpha_0 + \alpha_1 K_t + \alpha_2 L_t + \alpha_3 rem_t + u_t \quad (2)$$

Where,  $\alpha_0$  is the constant, the coefficient  $\alpha_i$  represents the long-run effects of a one-unit absolute change in the corresponding variable on the percentage change in GDP, or equivalently, on rate GDP growth, and  $u_t$  is the error term. For example, if *rem* increases by one percentage point, *gdp* increases by value of  $\alpha_3$ .

Augmented Dickey – Fuller test is used to check the four series (*ln gdp*, K, L, and *rem*) for stationarity and results are shown in Table 2. Results show that the four series are individually not stationary at level but first differenced stationary [i.e. integrated of the first degree I(1)]. Table 3 shows the optimal lag selection criteria outcomes. Schwarz information criterion (SIC) and the Hannan and Quinn information criterion (HQIC) suggest one-lag time period as optimal lag order to be used in Johansen test for cointegration and later in the Vector Error Correction Model (VECM). Johansen test for cointegration suggests that variables are cointegrated of rank 1 (see Table 4). Consequently, short-run behavior of the GDP growth is linked to its long-run value using the following Vector Error Correction Model (VECM):

regression error term. ECT stands for Error Correction Term, that can be written as:

#### 5. Empirical Results

Augmented Dickey-Fuller (ADF) test is used to test

whether each of the four series for unit root or stationarity. Test statistic, 5% critical value, and the p-value are shown for each variable at level and first difference in Table 2. The table shows that variables are individually nonstationary at level. For each variable, ADF test statistic is greater than the 5% critical value, and thus, we cannot reject the null hypothesis of unit root (nonstationary series). However, ADF test shows that the null hypothesis of unit root can be rejected when the variable is first differenced, since the test statistic is greater than the 5% critical values for each first difference series. More specific, the p-value for  $\ln gdp$ ,  $K$ ,  $L$ , and  $rem$  equals 0.3418, 0.5008, 0.9448, and 0.8018 respectively. All these p-values are greater than 5% and we fail to reject the null hypothesis of unit root. Therefore, all the four series are nonstationary at level. ADF test of each variable first difference shows that each variable is first difference stationary. The p-value of  $\Delta \ln gdp$ ,  $\Delta K$ ,  $\Delta L$ , and  $\Delta rem$  equals 0.0135, 0.0044, 0.0063, and 0.0021 respectively. Since each of these values is less than 5%, the null hypothesis of unit root is now rejected at 95% confidence level. As a result, it is possible now to conclude that the four series of GDP growth, capital, labor, and remittances are nonstationary at level, but first difference stationary, or equivalently, integrated of first degree [I(1)].

As mentioned earlier and shown in Table 3, Schwarz information criterion (SIC), the Hannan and Quinn information criterion (HQIC), sequential modified likelihood ratio test statistic (LR) and Akaike Information Criterion (AIC) are used as optimal lag selection criteria. The former three criteria suggest (1) as the optimal lag order, whereas Akaike Information Criterion (AIC), suggests optimal lag order to be two time periods. All these criteria are efficient, and since three of which suggest one lag, the analysis is conducted following SIC, HQIC, and LR using one time period lag. Table 4 shows the output of Johansen test for cointegration. The table shows that for (0) rank value,

the trace statistic of 62.37 is greater than the 5% critical value that equals 47.21 and thus the null hypothesis of no cointegration between the variables is rejected. For rank value of (1), the trace value equals 24.131 is less than the corresponding 5% critical value that equals 29.68. Given these values, we cannot reject the null hypothesis that there exist one cointegration equation. That is, there exist an equilibrium (or stable) long run relationship between GDP growth, capital, labor, and remittances. Based on these results, it is possible now to run a Vector Error Correction Model (VECM) according to equation (3) above.

Table 5 shows the output of the VECM that estimates effects on GDP growth of capital, labor, and remittances each of which is measured as a percentage of GDP. Results show that GDP growth in Jordan, capital accumulation, labor compensations, and remittances have long run, or equilibrium, relationship between them. Changes in capital accumulation, labor compensations, and workers' remittances stimulate economic growth in the long run. Any increase in these three variables positively and statistically significant impact the GDP growth rate in Jordan. These effects on GDP growth of capital, labor, and remittances are statistically significant at 99%, 99%, and 90% respectively in the long run. When capital accumulation percentage to GDP increases by one unit, GDP growth in Jordan increases by about 16.1%. Moreover, GDP growth increases by around 6.4% in response to one unit increase in labor compensations to GDP. This effect is statistically significant at 95% level. Remittances inflow has almost similar effect in magnitude to labor effect on GDP growth. That is, change in the percentage of remittances to GDP stimulates economic growth in Jordan roughly by 6.5% that is significant at 90% confidence level. These results are generally in line with the results of other studies have been conducted in Jordan.

Despite the strong statistically significant long-run

relationship between GDP growth as a dependent variable, and capital accumulation and labor compensations as independent variables, the short-run relationship does not show similar behavior. Coefficients of capital and labor are statistically insignificant in the short run. This means that changes in capital accumulation and labor compensations do not change GDP growth in the short run, but rather, it takes some time for the GDP to respond to capital and labor changes. Changes in remittances, on the other hand, have significant negative impact on the economic growth in the short run. As the percentage of remittances inflow to GDP changes by 1 unit, GDP growth rate declines by about 0.96 percent. The short run effect of remittances on economic growth suggests that remittances are not used in productive economic activities which in turn impact economic growth negatively in the short run. A reasonable explanation of the result related to the remittances and their impact on real GDP in the short run, is that in short run generally and during the last decade a considerable amount of remittances was directed to fund land during land boom in that time which is not productive and excluded from GDP calculations, remittances also may be saved, and they usually take time to affect the various economic activities, and hence they may have a negligible impact on GDP in the short run.

The Error Correction Model (ECM) that is considered here states that changes in GDP growth ( $\Delta \ln gdp$ ) depends on changes in capital ( $\Delta K$ ), changes in labor compensations ( $\Delta L$ ), and changes in remittances ( $\Delta rem$ ) in addition to equilibrium error term. Equilibrium error term ( $ECT_{t-1}$ ) is negative in sign and statistically significant at 99% level, suggesting that the model experiences disequilibrium in the short run. That is the level of GDP growth deviates from its equilibrium value. Error Correction Term ( $ECT_{t-1}$ ) represents or measures the speed of adjustment of GDP growth toward equilibrium. The coefficient that equals  $-0.0257$  has the correct sign and states that GDP growth

corrects its disequilibrium or deviation by roughly 2.6% a year. Finally, post estimation tests of short-run effects on GDP growth of capital, labor, and remittances, in addition to diagnostic check of the performance of the VECM are shown in Table 6. The null hypothesis of no short-run causality running from capital and labor is failed to reject whereas the null is rejected in case of remittances. Last, the null hypothesis of no autocorrelation at lag order of one is accepted and residuals experience no autocorrelation.

## 6. Conclusions

The objective of this paper is to explore effects of remittances inflow on real GDP growth in Jordan. For this purpose, data from World Bank and Central Bank of Jordan spanning the period 1976 – 2013 is used. Vector Error Correction Model (VECM) is employed in the analysis, and main findings are follows. Analysis reveals a positive long-run relationship between economic growth and its determinants in Jordan. The economic behavior is different in the short run, where capital accumulation and labor compensations show no statistical significant association with real GDP growth.

Short-run and long-run behavior of remittances suggests that remittances inflow in Jordan perhaps treated as unproductive savings in the short-run and thus can be seen as leakages to the economy. In the long-run, remittances are used in economic activities and real assets might be a candidate final destination of these remittances that explains the long-run positive effect on economic growth of remittances inflow. However, economic reaction to remittances stimulates further investigations about how actually remittances are treated or spent in Jordan.

The error correction term that suppose to measure the speed of adjustment toward equilibrium is found statistically significant, meaning that GDP growth adjusts to short-run disequilibrium at a speed of 2.6% a year. Findings of this paper are consistent with a significant body of studies have conducted in many

developing economies and in Jordan.

Results show interesting behavior of remittances, hence the Government is requested to develop regulations and to take measures that underpin job opportunities for the Jordanians to work in destination countries where most of our inflow remittances come from, some of the proposed regulations and measures such as; improving the quality of human resources, elimination any legal and organizational obstacles may

hinder facilitating job opportunities abroad for officials working in the local public sector, in addition to that, it is proposed to held some labor cooperation agreements with the Gulf States to facilitate the polarization of Jordanian labor. Finally, results highlight the need for further investigation to explore the effectiveness of remittances inflows beyond macroeconomic indicators such as unemployment and poverty alleviation in Jordan.

#### Appendix (Tables: 1-6)

**Table 1. Descriptive Statistics for GDP, Fixed Capital, Labor Compensations, and Remittances (1976-2013)**

Variable (million \$)	Obs	Mean	Std. Dev.	Min	Max
Real GDP	38	8937.41	4575.27	2749.00	18445.24
Real fixed capital	38	2586.87	1113.11	1012.91	5046.96
Labor compensations	38	3724.313	3115.346	630.1205	12230.65
Remittances	38	1690.805	1046.234	410.864	3642.676

**Table 2: Augmented Dickey Fuller Test for Unit Root (trend specification)**

<u>Level</u>				<u>First Difference</u>				
<u>Variable</u>	Test statistics	5% critical value	p-v	<u>Variable</u>	Test statistics	5% critical value	p-v	lags
lngdp	-2.473	-3.552	0.3418	$\Delta$ lngdp	-3.865	-3.564	0.0135	2
K	-2.180	-3.552	0.5008	$\Delta$ K	-4.202	-3.560	0.0044	1
L	-0.995	-3.552	0.9448	$\Delta$ L	-4.102	-3.560	0.0063	1
Rem	-1.576	-3.552	0.8018	$\Delta$ rem	-4.414	-3.560	0.0021	1

**Table 3: Lag Order Selection Criteria**

Sample: 1976 – 2013						number of obs. = 34
HQIC	SIC	AIC	LR	LogL	Lag	
19.10493	19.22326	19.04369	NA	-319.7427	0	
<b>10.46899*</b>	<b>11.06065*</b>	10.16279	<b>284.8401*</b>	-152.7675	1	
10.65352	11.71851	<b>10.10236*</b>	25.04013	-135.7402	2	
10.94959	12.48791	10.15348	18.69125	-120.6092	3	
11.35805	13.36971	10.31698	13.22044	-107.3887	4	

*LR* denotes sequential modified likelihood ratio test statistic

**Table 4: Johansen Tests for Cointegration**

Trend: constant		Number of observations = 36			
Sample: 1978 - 2013		Lags = 1			
maximum rank	parms	LL	eigen value	trace statistic	5% critical value
0	20	-177.72295	.	62.3761	47.21
1	27	-158.60037	0.65436	24.1310*	29.68
2	32	-151.75276	0.31643	10.4358	15.41
3	35	-147.48798	0.21096	1-9062	3.76
4	36	-146.53488	0.05157		

**Table 5: Vector Error Correction Model output; Jordan (1976 – 2013)**

[lag = 1]

<b>Long-run estimates:</b>				10% critical	5% critical	1% critical
Ln(GDP)	Coefficient	Std. Err.	t	value	value	value
K	0.16135***	0.02926	5.5149	1.6896	2.0301	2.4377
L	0.063891***	0.02275	2.80895			
rem	0.064949*	0.03753	1.73072			
cons.	17.42568	1.23415	14.1196			

<b>Short-run estimates:</b>			
$\Delta$ lngdp	Coefficient	Std. Err.	t-statistic
ECT (-1)	-0.025678***	0.00724	-3.54836
$\Delta$ Lngdp (-1)	0.13673	0.18855	0.72517
$\Delta$ K (-1)	0.00041	0.00219	0.18535
$\Delta$ L (-1)	-0.00329	0.00589	-0.55861
$\Delta$ rem (-1)	-0.00956***	0.00378	-2.5281

N	36
R-sq	0.31599
F-statistic	3.58023

\*\*\* means that the coefficient is statistically significant at 99% confidence level.

\*\* means that the coefficient is statistically significant at 95% confidence level.

\* means that the coefficient is statistically significant at 90% confidence level.

**Table 6: Post-estimation Tests of Short-Run Relationships and Residual Autocorrelations**

<b>Short run test:</b> Ho: There is no short-run causality running from (K, L, or rem) to GDP growth.			
Variable	Chi2 statistic	Prob > chi2	Ho
K	0.02	0.8824	<i>fail to reject Ho</i>
L	0.40	0.5277	<i>fail to reject Ho</i>
Rem	4.76	0.0291	<i>reject Ho</i>

<b>Autocorrelation test:</b> Ho: no autocorrelation at lag order 1				
lag	chi2 statistic	df	Prob > chi2	Ho
1	11.9028	16	0.75064	<i>fail to reject Ho</i>

## REFERENCES

- Adams, Richard (2008). The Demographic, Economic and Financial Determinants of International Remittances in Developing Countries. *The World Bank*, WPS 4583.
- Al Akayleh, Fayq (2011). Labor Migration, Workers' Remittances and Economic Activity: New Instrumental Variables for the Effect of Remittances. *J Soc Sci.*, 28 (3): 211-224.
- Al-Assaf, Ghazi and Abdullah Al-Malki (2014). Modelling the Macroeconomic Determinants of Workers' Remittances: The Case of Jordan. *International Journal of Economics and Financial Issues*, 4 (3): 514-526.
- Assaf, Ahmad (2015). Workers' Remittances and Economic Growth: Evidence From Jordan. *European Scientific Journal*, 11 (25): 40-54.
- Barajas, Adolfo; Ralph Chami; Connel Fullenkamp; Michael Gapen and Peter Montiel (2009). *Do Workers' Remittances Promote Economic Growth?* IMF WP/09/153 (Washington: International Monetary Fund).
- Barguelli, Achouak; Mohamed Zaiem and Murad Zmami (2013). Remittances, Education and Economic Growth: A Panel Data Analysis. *Journal of Business Studies Quarterly*, 4 (3): 129-139.
- Benmamoun, Mamoun and Kevin Lehnert (2013). Financing Growth: Comparing The Effects of FDI, ODA, and International Remittances. *Journal of Economic Development*, 38 (2): 43-65.
- Buch, Claudia and Anja Kuckulenz (2009). Worker Remittances and Capital Flows to Developing Countries. *International Migration*, 48 (5): 89-117.
- Central Bank of Jordan (2014). *Monthly statistical Bulletin*, 50 (1).
- The Center for Strategic Studies (2012). *Jordanian Economic Indicators Bulletin* 2011. Amman, Jordan University.
- Chami, Ralph; Connel Fullenkamp and Samir Jahjah (2003). "Are Immigrant Remittance Flows A Source of Capital for Development?" Washington: *International Monetary Fund Working Paper* 03/189.
- El-Sakka, Mohammad and Robert McNabb (1999) The Macroeconomic Determinants of Migrant Remittances, *World Development*, 27: 1493-1502.
- El-Sakka, Mohammad (2007). Migrant Workers' Remittances and Macroeconomic Policy in Jordan. *Arab Journal of Administrative Sciences*, 14 (2): 1- 22.
- Emilsson, Annie (2011). The Impact of Remittances on Labor Supply: The Case of Jordan, Unpublished Master Thesis, Lund University, Sweden.
- Elbadawi, Ibrahim and Rezende Rocha (1992). Determinants of Expatriate Workers' Remittances in North Africa and Europe. *The World Bank*, WPS 1038.
- Glytsos, Nicholas (1993). "Measuring the income effects of migrant remittances: A methodical approach applied to Greece," *Economic Development and Cultural Change*, 42: 1, October.
- Khan, Munir and Mirkalan Shah (2012). An Empirical Analysis of The Determinants of Overseas Workers Income In Rural Area of District Swabi, *Pakistan. Sarhad J. Agric.* 28 (1): 115-120.
- McCormick, Barry and Jackline Wahba (2000). "Overseas Employment And Remittances To A Dual Economy." *The Economic Journal*, 110: 509-534.
- Migration and Development Brief 23 (2014). Migration and Remittances: Recent Developments and Outlook. Migration and Remittances Team, *Development Prospects Group of the World Bank*.
- Migration Policy Institute (2014). *Remittance Trends over Time*. Available [on-line] <http://www.migrationpolicy.org/programs/data-hub/global-remittances-guide>.
- Mim, Sami and Mohamed Ali (2012). Through Which Channels Can Remittances Spur Economic Growth in MENA Countries? *Economics*, 6: 2012-33.
- Mohaddes, Kamiar and Mehdi Raissi (2011). Oil Prices, External Income, and Growth: Lessons from Jordan, *IMF Working Paper* No.11/291.
- Mouhoud, El Mouhoub; Joel Oudinet and Elif Unan (2008). Macroeconomic Determinants of Migrants' Remittances in the Southern and Eastern Mediterranean Countries. A Seminar on Demography, employment and migration

- between the shores of the Mediterranean, Université Paris north and Gdri Dreem – Cnrs, January 25, 2008, MSH Paris Nord.
- Mundaca, Gabriela (2009). Remittances, Financial Market Development, and Economic Growth: The Case of Latin America and the Caribbean, **Review of Development Economics**, 13 (2): 288-303.
- Nsiah, Christian and Bichaka Fayissa (2013). Remittances and economic growth in Africa, Asia, and Latin American-Caribbean countries: a panel unit root and panel cointegration analysis. **Journal of Economics and Finance**, 37:424-441.
- Lucas, Robert (2005). **International Migration to the High-Income Countries: Some Consequences for Economic Development in the Sending Countries**. Proceedings of Annual 7th World Bank Conference on Development Economics, Amsterdam May 23-24. Edited by (Bourguignon, F.)
- Lucas, Robert and Oded Stark (1985). Motivations to Remit: Evidence from Botswana, **Journal of Political Economy**, 93(5): 901–918.
- Ratha, Dilip (2006). **Economic Implications of Remittances and Migration**. World Bank, 2<sup>nd</sup> Intl. Conference on Migrant Remittances, London November 13, 2006.
- Russell, Sharon (1986). Remittances from International migration: A Review in Perspective. **World Development**, 14 (6): 677-696.
- Saadi-Sedik, Tahsin and Martin Petri (2006). To Smooth or Not to Smooth: The Impact of Grants and Remittances on the Equilibrium Real Exchange Rate in Jordan, **IMF Working Paper**, WP/06/257.
- Samuel, John and Susan George (2002). Globalization, Migration and Development. **Canadian Studies in Population**. 29 (1): 31-52.
- Singh, Raju; Markus Haacker; Kyung-woo Lee and Maelan Goff (2010). Determinants and Macroeconomic Impact of Remittances in Sub-Saharan Africa, **Journal of African Economies**, 20 (2): 312-340.
- Stahl, Charles and Fred Arnold (1986). Overseas Workers' Remittances in Asian Development. **International Migration Review**, 20 (4): 899-925.
- Swaidan, Ziad and Mihai Nica (2002). The 1991 Gulf War And Jordan's Economy. **Middle East Review of International Affairs**, 6 (2): 70-76.
- Taghavi, Majid (2012). The Impact of Workers' Remittances on Macro indicators: the Case of the Gulf Cooperation Council. **Topics in Middle Eastern and African Economics**. 49-73.
- World Bank (2014). Migration and Development Brief. [on-line] Available [http://siteresources.worldbank.org/INTPROSPECTS/Images/334933-1173798973801/3552714-1379896932047/migration\\_brief\\_23\\_infographic.jpg](http://siteresources.worldbank.org/INTPROSPECTS/Images/334933-1173798973801/3552714-1379896932047/migration_brief_23_infographic.jpg)
- Yaseen, Hadeel (2012). The Positive and Negative Impact of Remittances on Economic Growth in MENA Countries. **The Journal of International Management Studies**, 7: 7-14.

## تدفقات حوالات العاملين والنمو الاقتصادي: دراسة تطبيقية عن الأردن

سهيل مقابلة<sup>1</sup>

### ملخص

يهدف هذا البحث إلى دراسة أثر تدفقات حوالات العاملين على النمو الاقتصادي الحقيقي في الأردن خلال الفترة 1976-2013. بيانات البنك الدولي والبنك المركزي الأردني خلال فترة الدراسة تم استخدامها. تم استخدام نموذج تصحيح الخطأ في التحليل.

تشير أهم نتائج البحث إلى وجود علاقة ايجابية بين النمو الاقتصادي الحقيقي وكل من الحوالات المالية وتكوين رأس المال وقوة العمل في المدى الطويل. في المدى القصير، بيّنت الدراسة أنه لا يوجد هناك علاقة ذات دلالة إحصائية بين تكوين رأس المال وقوة العمل وبين النمو الاقتصادي الحقيقي، في حين أن الحوالات المالية لها أثر سلبي على النمو الاقتصادي الحقيقي في المدى القصير. يظهر حد تصحيح الخطأ الذي يقيس سرعة العودة إلى حالة التوازن بقيمة سالبة وذات دلالة إحصائية، حيث إن نمو الناتج المحلي الإجمالي يصحح عدم التوازن بمعدل 2.6٪ سنوياً.

**الكلمات الدالة:** الحوالات المالية، نمو الناتج المحلي الإجمالي الحقيقي، نموذج تصحيح الخطأ، الأردن.

---

<sup>1</sup> أستاذ مساعد، قسم الاقتصاد، جامعة اليرموك، الأردن

✉ smagableh@yu.edu.jo

تاريخ استلام البحث 2015/10/14 وتاريخ قبوله 2016/2/21.