WORKERS' REMITTANCESAND ECONOMIC GROWTH: EVIDENCE FROM JORDAN

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Abstract
The main goal of the present study is to highlight the effect of remittances on economic growth (GDP). Using regression analysis (OLS), the study also analyzes the effects of other traditional sources of economic growth, such as gross fixed capital formation, foreign direct investment, and labor force. The study shows that there is a positive effect of remittances on GDP. These results are in line with the deferent studies. On the other hand the effects of other traditional sources of economic growth, such as gross fixed capital formation show that there is a positive effect on GDP , a negative effect of foreign direct investment on GDP, while no significant effect of labor force on GDP. Thus the study can conclude the following for the case of Jordan as far as economic growth is concerned:

-       Remittances in Jordan are used both for consumption to increase the standard of living for family in the home country and profit-driven investments.

-       Fixed capital is the key factor that promotes economic growth of Jordan.

-       Jordan needs to increases the external capital flow in general and consequently the role of FDI as part of it.

-       labor force is not considered to be the main contributor to economic growth of Jordan

Keywords: Remittances, Economic growth (GDP), Gross fixed capital formation, Foreign direct investment, Labor force, Jordan

Background
Jordan is classified as a lower middle income country (World Bank 2011) and it has shown strong economic performance since 2000 with an annual GDP growth averaging 7.5 percent and per capita GDP more than doubling. Due to the economic slowdown in 2008, and the unstable situation in the region, Jordan is now meeting several challenges, including

vulnerability to fluctuations in the international oil market, high unemployment and dependency on remittances from the Gulf States (World Bank 2011).

Migration from Jordan has been important for the economic development in the country as it has functioned as a labor exporter to the oil rich countries and a receiver of remittances in the form of labor income. In spite of its small population, Jordan is one of the key labor exporting countries in the Middle East. It is the third largest remittance receiving country in the Middle East following Egypt and Morocco (El-Sakka 2007, p 5). In 1984 remittances accounted for one-fourth of Jordan‟s GDP. In the end of 1980 the return migration from the Gulf started and accelerated during the Gulf War. This return of migrants increased the population of Jordan by ten percent and the fall in remittances accounted for ten percent of GDP. In the mid-1990s the stability of the region increased and again, the Jordanian skilled labor started to migrate to the Gulf States. As we can see in figure (1), the flow of remittances to Jordan has increased the last 20 years and a plausible explanation for that could be a decrease in the transfer cost for sending money back home, due to technological improvements and more competition among financial institutions (Acosta 2006, p 11).

Figure (1) The flow of remittances to Jordan

The flow of remittances to Jordan (1975- 2013) Million $
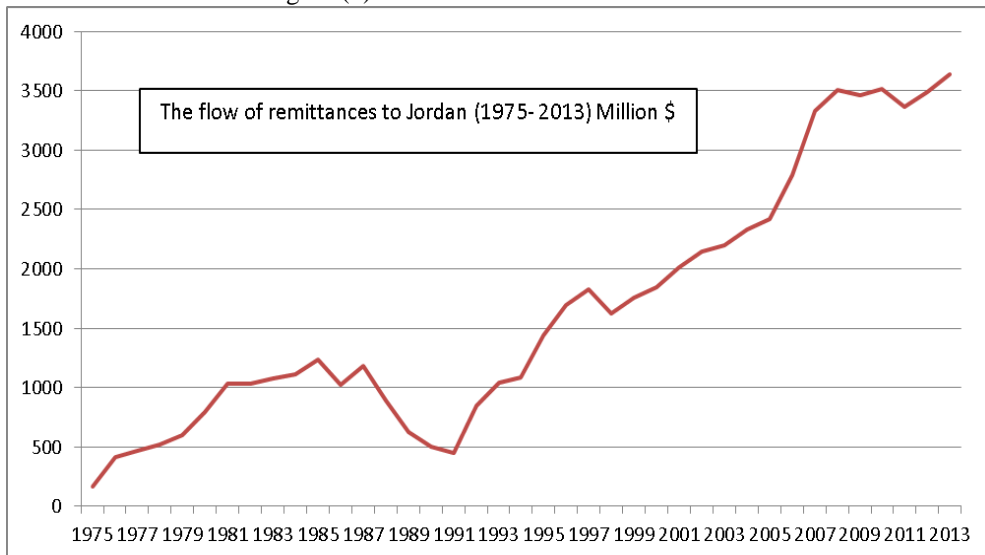
Source: Author's calculation from World Bank Indicators (2015).

According to some estimates, if one takes the unofficial remittances into account, the actual remittances should be about 60 percent higher (El-Sakka 2007, p 5). Remittances per-capita in Jordan is also the highest among labor exporters in the Middle East (ibid. p 5). Jordanian labor remittances are among the most important economic variables that contribute to the

growth of the national economy. It represents an important economic resource in the Jordanian balance of payments, because of the high ratio of the total value of receipts that reached 25 percent of the current balance of payments. The remittances contributed to more than 40 percent of the balance of services, and more than 20 percent to GDP in the beginning of the 21st century (Central Bank of Jordan, 2010). 250,000 Jordanians are working abroad and the majority of them have relatively high educational qualifications like a university degree. A large part of the senders are working in the Arabian Gulf States (Sondos and Kharmeh 2010, p 122). Recent years have seen an improvement in relations between Jordan and the Arab Gulf States, which has led to an increased demand for Jordanian labor, thus increased remittances.

The structure of this paper is as follows. Section two briefly reviews the relevant empirical literature on the links between remittances and economic growth. Section three presents the research design and methodology we are to use in our research, alongside the selected economic variables. Section four discusses the results from estimation of the econometric models, while section five concludes.

Research problem

Since remittances received are a potential source of investments and are therefore able to bring about concrete economic benefits, estimating their macroeconomic effects is an issue of both economic and politic interest. The macroeconomic effects of remittances and especially their economic growth potential have been under-researched in Jordan. Consequently, our research objective is to investigate, through regression analysis using OLS, the contribution of the remittances received in Jordan to its long-term economic growth.

A Review of Selected Literature

In literature different studies that were employed to show the contribution of worker remittances on economic growth had provided mixed results. These studies serve to underscore the increasing importance of remittances provided by migrant workers from developing countries working in other countries. These theoretical strands as following:

–   **Remittances have a positive impact on the economic growth:**
those arguing that remittances have a positive impact on the economic growth (World Bank 2006, Shafqat, Ahmad, Bano 2014, Pradhan, G., Upadhyay, M., &Upadhyaya, K. 2008,Nsiah, C., &Fayissa, B. 2011, M. SayedAbouElseoud 2014, Khalid Al Khathlan, 2012, Adela Shera, Dietmar Meyer 2013, AysıtTansel, Pınar Yaşar, 2010, HarshaParanavithana 2014,

Mohammad Salahuddin and Jeff Gow 2015).Table (1) summarizes these literatures.

Table (1) literatures showing a positive impact of remittances on economic growth

Authors/ Study Aim	Year	Variables/ Model	Data Collection/ Study Period	Results
Mohammad Salahuddin and Jeff Gow reexamines the relationship between migrant remittances and economic growth	2015	cross-sectional dependence test (CD)/ CIPS panel unit root test/ Panel Pedroni and Westerlundcointegration tests/ and Pooled Mean Group (PMG) regression technique	Bangladesh, India, Pakistan and the Philippines/ panel data (1977-2012)	A highly significant long-run positive relationship between remittance and economic growth in these countries. However, there is an insignificant positive association between them in the short run.
HarshaParanavithana to understand the relationship between workers' remittances and economic growth in Sri Lanka	2014	vector error correction model	time series annual data over the 1977-2012	A positive direct as well as indirect relationship between workers' remittances and economic growth in the long-term. However, the Wald test results demonstrate that there is no short-run causality between workers' remittances and economic growth, either directly or indirectly.
Shafqat, Ahmad, Bano contribution of worker's remittance in the growth of the economy of Pakistan.	2014	GDP per capita, money and quasi money, gross domestic savings, and Current account BAL or balance/ multiple regressions model	1991 - 2010	remittance are the famous mean of economic growth and have significant positive relationship with each other
M. SayedAbouElseoud investigating the impact of workers' remittances on the major macroeconomic variables in the Egyptian economy	2014	private capital formation, total exports, total imports, money supply and exchange rate Cointegration,private consumption, government spending, and economic growth/ Error Correction Model and Granger Causality techniques.	1991-2011	the existence of cointegration between workers' remittances and the macroeconomic variables; also there are unidirectional causality runs from workers' remittances to private capital formation, total exports, total imports, money supply and exchange rate, while there is bidirectional causality between workers' remittances and each of private consumption, government spending, and economic growth.
Adela Shera, Dietmar Meyer to observe the impact of remittances on	2013	GDP per capita in country, remittances, investment in physical and human capital, trade, foreign direct investment,	panel data set of 21 developing countries	remittances do have positively impact on the growth of the GDP per capita of Albanian country, And a 1 percent increase in remittances lead

economic growth		final consumption expenditures, inflation, and Fixed capital Formation	1992-2012	to a 0.14 percent increase in the GDP per capita income.
Khalid Al Khathlan to establish the long-run and short –run relationship between worker remittances and economic growth in Pakistan	2 0 1 2	GDP; FDI; export; inflation/ autoregressive distributed lag (ARDL) test and the error correction model (ECM) techniques	1976-2010	existence of a positive and significant relationship between worker remittances and economic growth in the long-run and short-run
Nsiah, C., &Fayissa, B. investigate the relationship between economic growth and remittances	2 0 1 1	panel unit root and panel co-integration tests	64 different countries of African, Asian, and Latin American-Caribbean 1987-2007	there is positive relationship between remittances and economic growth throughout the whole group
AysıtTansel, Pınar Yaşar to investigate the impact of remittances on key macro variables in Turkey	2 0 1 0	linear, demand oriented, simultaneous equation, dynamic macro econometric model/ consumption, investment, imports and income	1964-2003	Impact of remittances on consumption, imports and income are all positive and reduce gradually while that on investment wears out in the second year. The impact multiplier for income implies a substantial increase in income due to remittances through the multiplier process.
Pradhan, G., Upadhyay, M., &Upadhyaya, K. investigates the relationship between remittances and economic growth	2 0 0 8	panel data techniques fixed effects and random effects	39 developin g countries panel data from 1980–2004	Remittances has a direct relationship with economic growth
World Bank investigating the impact of workers' remittances on the economy	2 0 0 6	initial GDP per capita, the secondary school enrolment ratio, the ratio of private domestic credit to GDP, the ICRG political risk index, the ratio of real imports and exports to GDP, the inflation rate, real exchange rate overvaluation, government consumption	conducted cross-country growth regression s on a data set of 67 countries 1991–2005	positive relationship between the total remittances–to– GDP ratio and GDP growth, both when investment was included and when it was excluded from the estimations

– **Remittances have a negative impact on the economic growth:**
Those explaining negative effects on the economy (Chami et al. 2003,IMF 2005, Giuliano and Ruiz-Arranz 2005, KARAGÖZ, 2009, MdShoaib Ahmed 2010, Edwards 2009, AltinGjini 2013).Tables (2) summarize these literatures.

Table (2) literatures showing a negative impact of remittances on economic growth

Authors/ Study Aim	Year	Variables/ Model	Data Collection/ Study Period	Results
AltinGjini investigates the role of remittances on economic growth in Central and Eastern European (CEE) countries	2013	a fixed-effects model with heteroscedasticity corrected standard errors	balanced panel data covering the period from 1996−2010	Remittances have had negative effects on growth in this area for the period analyzed. An increase in remittances by 10% decreases the output by about 0.9%.
MdShoaib Ahmed Examined whether workers' remittances have growth impact on Bangladesh economy?	2010	per capita GDP, ratio of exports to GDP, ratio of gross domestic investments to GDP, and ratio of foreign direct investment inflow to GDP/ time series regression	1995-2006	remittance flows to Bangladesh have been statistically significant but have negative impact on growth
Edwards examines the relationship and growth impact of remittance and aid transfers	2009	fixed effects panel estimations on 22 LAC economies	1979-2008	remittances and foreign aid inflows are negatively associated with growth
KARAGÖZ, whether workers' remittances have growth impact on Turkish economy	2009	per capita GDP, gross capital formation (gross domestic investment), and net private capital flows	1970-2005	remittance flow to Turkey have statistically meaningful but negative impact on growth
Giuliano and Ruiz-Arranz the impact of workers' remittances on growth	2005	per capita GDP growth remittances–to– GDP ratio, the investment rate, population growth, the fiscal balance as a percentage of GDP, years of education, a measure of openness, and inflation.	73 countries 1975–2002	Did not find total remittances to be significantly related to growth.
Chami et al. investigation of remittances and remittance systems, including their effect on poverty and macroeconomic performance	2003	workers' remittances and employee compensation, the individual components of workers' remittances, employee compensation, and migrants' transfers	113 countries	remittances had a negative effect on growth

45

–   **Remittances have a mixed impact on the economic growth:**
Combining the above two arguments (Glytsos 2005, Habib, Md. R., Nourin, S. 2006, Fayq Al Akayleh 2011, SebilOlalekanOshota, AbdulazeezAdeniyiBadejo 2014, Mim and Ali 2012, Syed TehseenJawaid, Syed Ali Raza 2012).Table (3) summarizes these literatures.

Table (3) literatures showing a mixed impact ofremittanceson economic growth

Authors/ Study Aim	Year	Variables/ Model	Data Collection/ Study Period	Results
SebilOlalekanOshota, AbdulazeezAdeniyiBadejo investigated the relationship between remittances and economic growth in Nigeria	2014	error correction modeling approach/ gross fixed capital formation, Foreign aid, foreign direct investment, and openness to trade	1981-2011	in the long run, remittances impact positively on the economic growth of Nigeria. However, remittances show a signify cant negative relationship with output in the short run
Mim and Ali the remittances' effect on economic growth	2012	panel data techniques for MENA countries	1980-2009	the most important part of remittances is consumed and that remittances stimulate growth only when they are invested
Syed TehseenJawaid, Syed Ali Raza To investigate the relationship between workers' remittances and economic growth in China and Korea.	2012	. Johansen and Jeuuselius'scointegration technique, error correction model, and sensitivity analysis	annual time series data over the period of 1980 - 2009	There exists significant positive long-run relationship between remittances and economic growth in Korea, while, significant negative relationship exist between remittances and economic growth in China. Error correction model confirms the significant positive short-run relationship of workers' remittances with economic growth in Korea, while the results of China were insignificant in short run. Causality analysis confirms unidirectional causality runs from workers' remittances to economic growth, in both China and Korea. Sensitivity analysis confirms that the results are robust.
Fayq Al Akayleh t suggests a new methodology to estimate the 'actual net effect' of remittances on economic activity. Applying this new	2011	Consumption, investment, government expenditure, net exports.		Inward remittances have positive and significant effects on consumption, investment, government expenditure and a negative effect on net exports. Outward remittances have a negative impact on consumption, investment and government expenditure and a positive impact

methodology to a small and open economy, namely Jordan				on net trade. The total effect of remittances on GDP, however, is positive
Habib, Md. R., Nourin, S. the impact of workers' remittances on growth	2 0 0 6	Migrant remittance and per-capita GDP growth	South and South East Asian economies	The impacts of workers remittances on economic growth are mixed. there is negative relationship between migrant remittance and per-capita GDP growth in Thailand, Srilanka, India and Indonesia, whereas this relationship is positive in Bangladesh, Pakistan and Philippines
IMF impact of remittances on growth	2 0 0 5	per capita output growth	101 developing countries (1970-2003)	No statistical link between remittances and per capita output growth, or between remittances and other variables such as education or investment rates.
Glytsos the impact of remittances on output varies over time and across countries	2 0 0 5	investment, consumption, imports and output	Egypt, Greece, Jordan, Morocco, and Portugal 1969-1998	For Egypt, Jordan, and Morocco the growth-generating capacity of rising remittances characteristic is smaller than the growth-destroying capacity of falling remittances.

Research design and methodology

Our search for proofs in favor of the hypothesis of remittances as a source of economic growth in Jordan is based on multi-factorial regression models. The main focus in these models is on the potential relationship between GDP as an exogenous (dependent) variable and remittances, our variable of interest, as endogenous (independent) variable. According to economic theory and econometric practice, several other independent variables (production factors) have to be includedin the models as control variables. Tables 4 and 5 display all the variables included in the regression models that we are going to test.

Table (4) (Dependent variable-GDP)

Variable Name	Description
GDP	GDP (US$)
GFCF	Gross fixed capital formation (US$)
Labor	Labor force, total (persons)
Remit	remittances, received (US$)
FDI	Foreign direct investment, net inflows (US$)

Table (5) (Dependent variable-Annual GDP growth)

Variable Name	Description
GDP_gr	GDP growth (%)
GFCF %	Gross fixed capital formation ((% of GDP)
Labor_p	Labor force participation rate, total (% of total population ages 15-64)
Remit %	remittances, received (% of GDP)
FDI (%)	Foreign direct investment, net inflows (as % of GDP)

Data

The panel data analysis focuses on Jordan. Variables are observed over the period from 1975 to 2013 (source: World Development Indicators, the World Bank Group) as following:

Variable symbol	Variable Name	Description
GDP	Gross Domestic Product	• At market prices based on US Dollar currency. • GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. • It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.
GFCF	Gross fixed capital formation	• Consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. • Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.
Labor	Labor force	• Comprises people ages 15 and older who meet the International Labour Organization definition of the economically active population: all people who supply labor for the production of goods and services during a specified period. • It includes both the employed and the unemployed.
Remit	remittances	• Workers' remittances and compensation of employees comprise current transfers by migrant workers and wages and salaries earned by nonresident workers. • Data are the sum of three items defined in the IMF's Balance of Payments Manual: workers' remittances, compensation of employees, and migrants' transfers. • Remittances are classified as current private transfers from migrant workers resident in the host country for more than a year, irrespective of their immigration status, to recipients in their country of origin. • Migrants' transfers are defined as the net worth of migrants who are expected to remain in the host country for more than one year that is transferred from one country to another at the time of migration. Compensation of employees is the income of migrants who have lived in the host country for less than a year. Data are in current U.S. dollars.
FDI	Foreign direct investment	• Is the net inflow of investment. • It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital.

Hypotheses

The main goal of the present study is to highlight the effect of remittances (RET) on economic growth (GDP). We will also analyze the effects of other traditional sources of economic growth, such as gross fixed capital formation (GFCF), foreign direct investment (FDI), and labor force (L). For this purpose, the four following hypotheses are stated, tested, and commented as below.

H_1	Because we are investigating the direct effect of remittances on growth, we expect the role of remittances to be negative. We believe that remittances in Jordan are used mostly for consumption and to increase the standard of living for family in the home country rather than using it for profit-driven investments. This expectation is in line with the conclusion of Chami, Fullenkamp, and Jahjah (2005) and Barajas et al. (2009).
H_2	We expect the effect of FDI on economic growth to be positive, because Jordan, in developing its standard of living, has faced limitations on capital input. This situation increases the role of external capital flow in general and consequently the role of FDI as part of it. The expectation of this hypothesis (positive effect of FDI on growth) is in line with the results of other works such as Bende-Nabende and Ford (1998), Soysa and Oneal (1999), and JasminkaSohinger (2005), which all concluded that FDI plays a positive role in economic growth.
H_3	We expect a positive effect of gross fixed capital formation (GFCF) on output growth. This can be understood simply, because the increase of fixed capital inputs increases the output produced. This is in line with the conclusions of Solow (1958), De Long and Summers (1991), De long, Summers, and Abel (1992), and Shujie Yao and Kailei Wei (2007), all of whom concluded that fixed capital is the key factor that promotes growth.
H_4	We expect a positive effect of labor force on economic growth. Webelieve that human capital plays a key role in economic growth and themore skilled labor force in a nation, the more is the prosperity. This is in line with Pissarides (2000), Krichel and Levine (2002), Mortensen (2004), all of whom concluded that labor force is the main contributor to economic growth.

Results and discussion

Table (6) descriptive statistics

	Remittance	FDI	CFGF	Labor	GDP
Mean	2001.464	786.6429	3044.714	1070694.0	12298.61
Median	1834.500	233.0000	1948.500	975712.5	8294.500
Maximum	3643.000	3121.000	9168.000	1772361.	33678.00
Minimum	448.0000	-34.00000	964.0000	615058.0	4020.000
Std. Dev.	1043.658	1006.977	2286.520	368387.6	8898.795
Skewness	0.238510	1.043698	1.252125	0.507451	1.205579
Kurtosis	1.782636	2.703181	3.320601	2.064939	3.079491
arque-Bera	1.994444	5.186207	7.436398	2.221762	6.789998
Probability	0.368903	0.074788	0.024278	0.329269	0.033541
Sum	56041.00	22026.00	85252.00	29979419	344361.0
Sum Sq. Dev.	29409015	27378052	1.41E+08	3.66E+12	2.14E+09
Observations	28	28	28	28	28

Table (6) reflects the descriptive statistics of the variables. The mean value for remittance was (2001.464) with a standard deviation of (1043.658). THE Jarque-Bera test's probability of (0.368903) which is greater than 0.05 suggesting the acceptance of the null hypothesis (the data are normally distributed).

The mean value for FDI was (786.6429) with a standard deviation of (1006.977). THE Jarque-Bera test's probability of (0.074788) which is greater than 0.05 suggesting the acceptance of the null hypothesis (the data are normally distributed).

The mean value for GFCF was (3044.714) with a standard deviation of (2286.520). THE Jarque-Bera test's probability of (0.024278) which is less than 0.05 suggesting the rejection of the null hypothesis (the data is not normally distributed). The logarithm transformation was used to transform the data.

The mean value for labor force was (1070694.0) with a standard deviation of (368387.6). THE Jarque-Bera test's probability of (0.329269) which is greater than 0.05 suggesting the acceptance of the null hypothesis (the data are normally distributed).

The mean value for dependent variable GDP was (12298.61) with a standard deviation of (8898.795). THE Jarque-Bera test's probability of (0.033541) which is less than 0.05 suggesting the rejection of the null hypothesis (the data is not normally distributed).

Table (7) regression analysis using OLS
Dependent Variable: GDP
Method: Least Squares
Date: 05/15/15   Time: 19:25
Sample: 1986 2013
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	246.7514	2129.995	0.115846	0.9088
Remittance	2.886889	1.236425	2.334869	0.0286
FDI	-1.098096	0.473371	-2.319735	0.0296
CFGF	3.553506	0.388535	9.145912	0.0000
Labor	-0.003439	0.004653	-0.739063	0.4673
R-squared	0.981000	Mean dependent var		12298.61
Adjusted R-squared	0.977696	S.D. dependent var		8898.795
S.E. of regression	1328.992	Akaike info criterion		17.38266
Sum squared resid	40623032	Schwarz criterion		17.62055
Log likelihood	-238.3573	F-statistic		296.8868
Durbin-Watson stat	1.489181	Prob(F-statistic)		0.000000

The results of table (7) indicate that the four factors that were assumed to affect GDP (remittances, FDI, GFCF, and labor force) relying on the probability of f test which was (0.000000) less than 0.05. the result

means that the four factors affect the GDP simultaneously. The values of R2 (0.981000) and adjusted R2 (0.977696) reveal a high percentage of the variation being accounted in the dependent variable (GDP) by the four factors

Testing the hypothesis
H_1: There is a negative effect of remittances on GDP
The results provided by table (7) show that there is a positive effect of remittances on GDP, this based on probability of the t-test which was (0.0286) suggesting the significant effect such that the magnitude of the effect can be quantified using the beta coefficient which was (2.886889). As a result the alternative hypothesis is accepted but in the positive effect rather than the negative effect.
H_2: There is a positive effect of FDI on GDP
The results provided by table (7) show that there is a negative effect of FDI on GDP, this based on probability of the t-test which was (0.0296) suggesting the significant effect such that the magnitude of the effect can be quantified using the beta coefficient which was (-1.098096). As a result the alternative hypothesis is accepted but in the negative effect rather than the positive effect.
H_3: There is a positive effect of GFCF on GDP
The results provided by table (7) show that there is a positive effect of GFCF on GDP, this based on probability of the t-test which was (0.0000) suggesting the significant effect such that the magnitude of the effect can be quantified using the beta coefficient which was (3.553506). As a result the alternative hypothesis is accepted.
H_4: There is a positive effect of labor force on GDP
The results provided by table (7) show that there is no significant effect of labor force on GDP, this based on probability of the t-test which was (0.4673) suggesting no significant effect such that the magnitude of the effect can be quantified using the beta coefficient which was (- 0.003439). As a result the alternative hypothesis is rejected noting that labor force has a negative effect rather than the positive effect on GDP

Results and discussions
The main goal of the present study is to highlight the effect of remittances on economic growth (GDP). Usingregression analysis (OLS), the study also analyzes the effects of other traditional sources of economic growth, such as gross fixed capital formation, foreign direct investment, and labor force. The study shows that there is a positive effect of remittances on GDP. This result are in line with the following studies results(World Bank 2006, Shafqat, Ahmad, Bano 2014, Pradhan, G., Upadhyay, M.,

&Upadhyaya, K. 2008, Nsiah, C., &Fayissa, B. 2011, M. SayedAbouElseoud 2014, Khalid Al Khathlan, 2012, Adela Shera, Dietmar Meyer 2013, AysıtTansel, Pınar Yaşar, 2010, HarshaParanavithana 2014, Mohammad Salahuddin and Jeff Gow 2015).On the other hand the effects of other traditional sources of economic growth, such as gross fixed capital formation show that there is a positive effect on GDP , a negative effect of foreign direct investment on GDP, while no significant effect of labor force on GDP. Thus we can conclude the following for the case of Jordan as far as economic growth is concerned:

-    Remittances in Jordan are used both for consumption to increase the standard of living for family in the home country and profit-driven investments.

-    Fixed capital is the key factor that promotes economic growth of Jordan.

-    Jordan needs to increases the external capital flow in general and consequently the role of FDI as part of it.

-    labor force is not considered to be the main contributor to economic growth of Jordan

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