

Effects of Remittance on Economic Growth, Consumption, and Investment

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Abstract - Remittance is money sent directly from a foreign worker and transferred back to his or her home country. The typical migrant worker will send approximately 10% of their household income to their family in their home country. These remittances will then account for 50-80% of the household income of the recipients. According to statistics, remittance inflows into Jordan in 2018 amounted to \$4.4 billion. Most papers argued that remittance has a positive impact on local economic growth. However, few argued that remittance has no effect because remittance only impacts on consumption rather than investment. Thus, the purpose of this paper is to study the effect of remittances on economic growth in Jordan and study the link between remittances, consumption, and investment. The results indicate a highly positive correlation between remittance and GDP growth in Jordan, contributing to the overall economic development of the country. Furthermore, the Equilibrium Displacement model demonstrates that when at equilibrium a one percent change in remittance will increase household consumption; however, the same one percent change in remittance when at equilibrium have a negative effect on total investment.

Keywords: Consumption, Economic growth, Investment.

INTRODUCTION

Jordan is still heavily dependent on remittances. Remittances to Jordan account for an average of 18% of GDP for the period 1995 – 2010. This heavy reliance on remittance is what makes Jordan an attractive country for this particular analysis.

Remittance money that is sent home to Jordan becomes one of the largest financial inflows into Jordan, as it does for many undeveloped countries; remittance is second behind foreign direct investment (FDI). Many researchers and policy makers have started to notice not only the increasing volume, but also the stable nature of remittances to their developing countries

A lot of studies have analyzed remittances developmental impact on various fields. However, little attention has been paid to answer the question of whether remittances actually boost economic growth. Although we know remittances recipients use the money to buy food or other stuffs, we do not know whether remittances recipients use the money to invest.

In this paper, I will test whether remittances boost economic growth and whether remittances actually impact on consumption and investment at the same way. To do this I will use two separate methods; the first will use the econometric method and the second will use an equilibrium displacement method.

LITERATURE REVIEW

Koehlin and Leon examined the effect of migrant networks and their effects on migration cost. Using multiple cross section techniques, instrumental variables, and panel data methodologies the authors addressed the problems of endogeneity and serial correlation. The authors found strong evidence that an inverted U-curve exists between these variables. The authors explained how the formation of migrant's networks in the foreign country actually have a cost lowering effect on the migration costs for the lower income potential migrants that are still remaining in their home country. It is this cost lowering effect that makes the relationship between remittances and inequality an inverted U curve. The thought behind the existence of an inverted U curve is that in the beginning stages of migration, when the highest migration and information costs exists, the actual cost, and opportunity cost of the migration decision, can only be afforded by people in the higher income bracket. The remittances sent by these new migrants have the effect of increasing the levels of income inequality and thereby making migration more affordable to the lower income people.

Pradham, Upadhyay and Upadhuaya, used a standard growth model and found that the per capita growth of real GDP depends on remittances per capita, investment, openness, and 'polity' which measures the difference between democracy and autocracy. All of these variables are measured in five years and have five periods for each country from 1980 to 2004; resulting in panel data with 195 observations. The model is estimated using both fixed-effects and random-effects approaches.

The empirical results from this study show a significant overall fit, and demonstrate that remittances have a positive impact on growth. The coefficient of the remittance's variable is significant in two of four specifications.

The authors discussed that because many remittances are sent thru informal channels and therefore the official estimates of remittances used in the analysis tend to understate actual numbers. All other variables performed very well, with the exception of the 'polity' variable which gave mixed results. As the study of remittance grows, so will officially tracking, and a continued increase in the efforts to measure remittances each of which will increase the precision and efficiency with which the long-term effects of remittances on growth can be determined. For individual countries, creating an appropriate policy towards foreign employment of its residents will depend on these improvements in data and analysis.

Combes and Ebeke, this paper studies the impact of remittances on the household consumption instability problem in a large panel of undeveloped countries. Using a sample of undeveloped countries over the period from 1975 to 2004 and controlling for the endogeneity of remittances, the results suggest that the remittance recipient countries show that on average they have a much lower consumption instability due to the increase in money from remittances.

In this case, remittances appear to be a hedge against various types of macroeconomic instability, perhaps most importantly against exchange rate instability. However, the results emphasize some important heterogeneity among recipient countries. For example, the authors showed the marginal stabilizing impact of remittances significantly decreases with the levels of financial development and remittance ratios. The stabilizing impact of remittances is becoming weak when the private credit proration is more than 20% of GDP and when the remittance proration is more than 6% of GDP. The stabilizing impact of remittances enters the discussion about the effect of economic financial globalization on welfare. Previous papers have mainly concentrated on the effects of financial and trade openness on consumption instability; and examine the other aspects of economic globalization by looking at the effects of remittances on consumption instability. The paper also suggests that some countries have much greater stabilization from remittance inflows than others. This must be factored into any analysis of the developmental implications of remittances and not just presume that there is always a positive result from huge remittance inflows in all situations.

Stumpner presents a version of the distribution dynamics to analyze the transition dynamics and long-run behavior of European regions during the period 1995-2003. The author assumes that each country in the region's income follows a first order Markovian process with time-invariant transition probabilities. This assumes that the future income depends only on its income today. The paper explains that the use of filtered data is necessary to evaluate growth and convergence dynamics across regions.

The study demonstrates that Central and Eastern European regions will condemn no development trap in the long run. Spatial effects explain a substantial part of income distributions which describes that there is no emergence of the two-club regional world in the long run.

This paper aims to study how the remittances effect the recipient countries economic growth.

This study will differ from the previous studies mentioned above, because my study will use the neoclassical Solow Growth model to first examine economic growth, and then use the Equilibrium Displacement model to analyze the economic growth caused by remittance.

I will begin by using econometric methods to test that remittance has a positive effect on economic growth for the home country of Jordan. Then I will use econometric methods to calculate the elasticities. After calculating the elasticities, I will use the Equilibrium Displacement Method to analyze the exogenous variable remittances and its effect on the endogenous variable's economic growth.

DATA DESCRIPTION AND VARIABLE DEFINITIONS

Our sample consists of annual data for Jordan for the period 1975–2010. The data is from the International Financial Statistics (IFS) of the International Monetary Fund and from the World Development Indicators (WDI) of the World Bank.

In the Solow growth model, the dependent variable is the growth rate of output, measured as the growth of the real per capita GDP in dollars. The main variable has to be the capital labor ratio $k = K/L$.

Remittances, measured as workers' remittances, comprise of current transfers by migrant workers and wages and salaries earned by nonresident workers. 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 then transferred from one country to another at the time of migration. Then remittances per capita are the appropriate variable of interest. Openness to international trade, measured as the ratio of the sum of exports plus imports of goods to total output, is a control variable. This controls the policies, and I want to test what happens when they change policy and allow openness thus increasing imports and exports.

In Equilibrium displacement model, they are consumption C and investment I . Letting $R =$ Remittances, the complete model is:

$$C = C(Y, R) \text{ (consumption)} \quad (1)$$

$$I = I(N, R) \text{ (investment)} \quad (2)$$

$$Y = C + I + G \text{ (equilibrium)} \quad (3)$$

There are 3 equations in 3 endogenous variables (Y, C, I) and 3 exogenous variables (N, G, R). At issue is the extent to which a change in R affects Y (GNP). This is determined by placing the structural model in EDM form and solving for the reduced form:

$$Y^* = a N^* + b G^* + c R^* \quad (4)$$

Where a, b and c are reduced from elasticities.

The reduced form elasticities are functions of the structural elasticities and share parameters. The structural elasticities are obtained by estimating the consumption and investment functions.

First, we use the Solow growth model to test the long run effects of remittance. The Solow model demonstrates a positive long run effect on GNP, which makes us want to test the short run effects of remittance and examine what aspects remittance effects. The Equilibrium Displacement model will do just that. The Equilibrium Displacement model will exactly tell us how much a 1% change in remittance will impact GNP.

EMPIRICAL ANALYSIS

Solow Growth Model

Developed by American economist, and 1990 Nobel Prize recipient Robert Solow; the Solow growth model is a neoclassical growth model of long run economic growth. The Solow growth model starts with a neo classical production function $Y/L = F(K/L)$ and rearranges the function to $y = f(k)$. From the production function output per worker is a function of capital per worker. This growth model assumes diminishing returns to capital shown by the slope of the production function.

Solow, in 1956, derived his model by beginning with a production function:

$$Y = F(K^a L^b) \tag{5}$$

Where, a and b are less than one, indicating diminishing returns to a single factor, and $a + b = 1$, indicating constant returns to scale.

Solow noted that any increase in Q could come from one of three sources:

An increase in L. However, due to diminishing returns to scale, this would imply a reduction in Y / L or output per worker.

An increase in K. An increase in the stock of capital would increase both output and Y / L

An increase in productivity could also increase Y / L or output per worker.

To concentrate attention on what happens to Y / L or output per worker (and unless the employment ratio changes, output per capita), Solow rewrote the Cobb-Douglas production function:

$$Y/L = F(K^a / L^{1-b}) \tag{6}$$

$$Y = F(K^a / L^a) = F(K / L)^a \tag{7}$$

Defining $y = Y / L$ and $k = K / L$, letting small letters equal per capita variables, we have $Y=f(Ka)$. If the Solow model is correct, and if growth is due to capital accumulation, we should expect to find

1. Growth will be very strong when countries first begin to accumulate capital, and will slow down as the process of accumulation continues.

2. Countries will tend to converge in output per capita and in standard of living. When all countries have reached a steady state, all countries will have the same standard of living.

The $y=f(k)$ line represents economic growth. The $S*f(k)$ line represents the impact of the national savings rate on economic growth. The $(n+g+\delta)*k$ line represents capital stock of the nation measured by $N =$ population growth rate, $G =$ technology / education growth rate, and $D =$ the capital depreciation rate. We do not include the interest rate in this equation, because interest rates only affect capital and do not directly affect GNP or Income. For this equation (O) openness, is included and an important variable since this is policy, and policy can directly affect income and GNP. For the use of this analysis, we derive the following equation and will assign the following:

$$Y=F(K,R,O) \tag{8}$$

Y denotes GDP per capita.

R is remittances per capital.

O is a control variable openness, measured as the ratio of the sum of exports plus imports of goods to total output.

K is the capital labor ratio.

The neo classical model requires the inclusion of capital in our equation. There is sometimes a risk of capital compounding monies sent from other countries back to the home country. Remittance is very different from Foreign Direct Investment, since foreign direct investment is sent for the sole purpose of capital investment. However, remittance is different since it is sent back to struggling family remaining in the country which then typically uses the money for consumption and not investment. This allows for the inclusion of capital in the equation while avoiding any compounding effect on remittance.

The equilibrium displacement model was developed and perfected by a number of economists. In 1958 Buse demonstrated the development of what he called “total elasticities” which were the reduced-form elasticities of a system of supply and demand equations for two commodities. These reduced form elasticities were further devised by Muth in 1964 when he developed reduced forms for proportional displacements from equilibriums for a system of equations of supply and demand for a product dependent on two factors of production and exogenous shifters for each of the functions. Buse later expanded the Equilibrium Displacement model when he used matrix algebra to state and solve his system of equations.

For the analysis here we derive the following equation and will assign the following to utilize the Keynesian Model to derive elasticities for our EDM form:

Let the structural model be defined as follows:

$$C = C(Y, R) \tag{9}$$

$$I = I(r, R) \tag{10}$$

$$Y = C + I + G \quad (11)$$

Where C, I, and G are expenditures by consumers, firms, and government, respectively, Y is national income (GNP), r is the business rate of interest on borrowed money, and R is remittances paid by out-of-country workers to domestic households or firms. In this model, remittances are assumed to be reflected in the level of consumption and/or investment expenditures. Hence, R appears in the behavioral equations (9) and (10), but not the accounting identity equation (11), as this would be double counting.

Following Keynes, consumption is assumed to be positively related to income ($\partial C / \partial Y > 0$) and investment is assumed to be negatively related to interest rates ($\partial I / \partial r < 0$). Based on a review of the literature, remittances are expected to have a positive effect on consumption ($\partial C / \partial R > 0$), but an ambiguous effect on investment (the sign of $\partial I / \partial r$ is an empirical issue). The model contains 3 endogenous variables (C, I, and Y) and 3 exogenous variables (G, r, and R). At issue is the effect of an increase in remittances on GNP in this simple Keynesian framework.

Equilibrium Displacement Model

In order to examine the effects of changes in Jordan’s remittances elasticity on household consumption and firm total investment we need to operate with the following assumptions:

- (1) A country has a closed economy
- (2) Remittances be treated as exogenous

Results:

The elasticity of remittances for household consumption and firm total investment that we obtain from above results are: 0.2 and -0.6. The income elasticity is 0.8, and the interest rate elasticity is -0.4, kC is about 0.7, the kI is about 0.1 and kG is about 0.2.

Table (1)
Final results

	G*	R*	r*
Y*	0.45	0.18	-0.09
C*	0.36	0.35	-0.07
I*	0	-0.6	-0.4

The remittances have a positive impact on GNP and household consumption. When in the equilibrium, a 1% increase in remittance will increase household consumption by about 0.35%; and total income will increase by about 0.18%. However, in equilibrium, a 1% increase in remittance will decrease firm total investment by about 0.6%. It is means that remittances are spent on consumption.

In all, the government spending has a positive impact on total income and household consumption. The remittances have a positive effect on total income and household consumption and a negative effect on firm total investment. The interest rates have a negative effect on total income and household consumption and a negative effect on investment. All the results are what we would expect; the most important result is that we have demonstrated that remittances have different impacts on household consumption and firm total investment and what those impacts are.

CONCLUSION

Using the Solow Growth model, we tested economic growth for Jordan. Then we used a Keynesian model to develop the elasticities for the variables we wish to examine; household consumption, and total investment. These elasticities were then used in developing the Equilibrium Displacement model to examine the remittance change effect on household consumption and total investment.

The Solow Growth model results demonstrate that a 1% change increase in remittances to Jordan will boost economic growth in Jordan by 0.24%. This large impact of remittance on Jordan’s economic growth demonstrates the importance of remittance on Jordan’s economic growth, and that further analysis of the remittance effect on Jordan is worthwhile. The error correction model demonstrates a reliable result for the Solow Growth model.

For further analysis of the effects of remittance on Jordan’s economic growth we choose to examine remittance effects directly on Household Consumption and Total Investment. To do this we will use the econometrics method to calculate the elasticities for both household consumption and total investment. The elasticities will tell us what a one percent change in remittance will directly do to the individual variable. In this case what a one percent change in remittance will cause household consumption and total investment to change by what exact amount. The regression results demonstrate that the elasticity for remittance for household consumption is 0.2, telling us that remittance will have a positive effect on the variables when we apply the Equilibrium Displacement model. The remittance effect on total investment is -0.6.

To complete the analysis of remittance effect on Jordan’s economic growth we develop the Equilibrium Displacement model to examine remittance effect on household income and total investment.

The Equilibrium Displacement model demonstrate that when at equilibrium a one percent change in remittance will increase household consumption by 0.35%; however, the same one percent change in remittance when at equilibrium will have a negative effect on total investment; decreasing total investment by 0.6% for each one percent increase in remittance.

This information should play a vital role when Jordan is developing new Government policies. Banks and other financial institutions should also take these results in consideration when making decisions concerning the flow, fees, and acceptance of remittances. For further study we could use these same models to study remittance of other countries to see if the effects of remittance on other countries are the same as remittance effects on Jordan. We could also use the Equilibrium Displacement model to examine other key variables for Jordan's economic growth, such as Government Revenue, or examine Jordan as an open economy and examine remittance effects on Imports.

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