Worker's Remittances and Economic Growth in Sri Lanka: An ARDL Cointegration Approach

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ABSTRACT

This study examines the relationship between worker's remittances and economic growth in Sri Lanka using Auto Regressive Distributed Lag (ARDL) approach for cointegration. It employs secondary time series data for Remittances, GDP, Exports and Investment gathered from World Development Indicators for the period from 1975 to 2015. The bounds test indicates that there exists a long run relationship between worker's remittances and economic growth in Sri Lanka during the study period. Short-run relationship between remittances and GDP is also captured from the Error Correction Model. Therefore, the policy makers can focus on increasing potential to earn more remittances and directing households to spend them on productive channels.

Keywords: ARDL Bounds test, Economic Growth, Remittances, Sri Lanka

Introduction and research problem/issue

Migrant worker's remittances are an important source of foreign exchange earnings in many developing and under developed countries. Most of these countries depend more on remittances to minimize the problems arising from the shortage of foreign exchange required for paying the import bills. Some economists argue that these remittances play an important role in promoting economic development (Datta and Sarkar, 2014, Siddique and Selvanathan, 2010) while others argue for the opposite.

Sri Lanka is a lower middle income country and its worker's remittances have increased dramatically over the past decade. Remittances to Gross Domestic Product (GDP) in Sri Lanka are as large as 8.5 percent in 2015[1] and the second largest source of foreign exchange followed by total exports. Figure 1 depicts that the inflow of remittances to Sri Lanka is showing an upward trend during past three decades. This increasing and large flow of remittances implies the significance of its macroeconomic impact for the country.
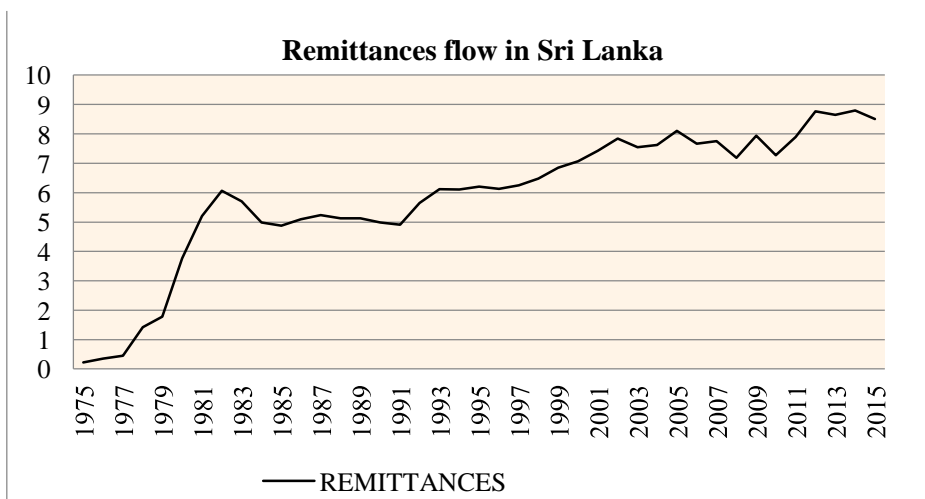
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[1] World Bank staff estimates.

Figure 1: Remittances of Sri Lanka as a Percentage of GDP (1975 -2015, before taking logarithms)

Since, remittances have become an important source of income in Sri Lanka, it may have significant impact on economic growth in the long run. If remittances are spent on education and welfare purposes, it may positively affect labour productivity and ultimately the economic growth of the home country. If used for consumption, multiplier effect would have a positive effect on output. Therefore, an examination of how worker's remittances affect economic growth of Sri Lanka would provide important insights for policy makers and economic agents. Review of the theoretical and empirical literature signifies that there is a gap in the recent empirical knowledge on how remittances affect economic growth in Sri Lanka. Thus, this study intends to fill this gap by considering the period from 1975 to 2015 to investigate how worker's remittances affect the economic growth of Sri Lanka.

Research Methodology

This study covers the period from 1975 to 2015 and is based on five variables; remittances as a percentage of GDP (REM), real GDP per capita (GDP), foreign direct investment (FDI), exports as a percentage of GDP (EXP) and investment…. (INV). Data are compiled from World Development Indicators of the World Bank.

Economic growth is defined as a function of remittances, foreign direct investment (FDI) inflows, exports and investment. The model can be expressed as;

$$LGDP = \beta_0 + \beta_1 REM + \beta_2 FDI + \beta_3 EXP + \beta_4 INV + \varepsilon_t …………(1)$$

This study employed the augmented Dickey- Fuller and the Phillips- Perron tests on REM and GDP series to investigate the random walk nature. ARDL bounds test approach developed by Pesaran et al. (2001) was adopted to detect the existence of cointegration or long-run equilibrium relationship among the variables in the model.

The following unrestricted regression equation was formulated under the bounds test approach;

$$\Delta LGDP = a_0 + \sum_{pi=0} \alpha_{1i} \Delta LGDP_{t-i} + \sum_{pi=0} \alpha_{2i} \Delta LREM_{t-i} +$$

$$\sum_{pi=0} \alpha_{3i}\Delta FDI_{t-i} + \sum_{pi=0} \alpha_{4i} \Delta LEXP_{t-i} + \sum_{ip=0} \alpha_{5i} \Delta LINV_{t-i} + \alpha_6 LGDP_{t-1} +$$

$$\alpha_7 LREM_{t-1} + \alpha_8 FDI_{t-1} + \alpha_9 LEXP_{t-1} + \alpha_{10} LINV_{t-1} + \varepsilon_t \dots\dots\dots\dots(2)$$

Where ln (.) is the logarithm operator, $\triangle$ is the first difference operator and ε_t is the error term.

The null hypothesis of no cointegration among the variables in equation 2 can be defined as;

H_0; $\alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = 0$, against the alternative hypothesis of

H_1; $\alpha_6 \neq \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq 0$,

E-views 9, STATA 12 and Microsoft Excel computer packages were used for data analysis.

Results and findings

First, Augmented dickey-Fuller (ADF) unit root test is applied on data series. According to the results, REM and FDI series are stationary at level, I (0) while GDP, EXP and INV variables are stationary after first differencing, I(1). This mixture of I(0) and I(1) of variables led to apply the Auto Regressive Distributed Lag (ARDL) bounds test for cointegration to test the long run equilibrium relationships.

Results of the ARDL bounds test for cointegration are shown in the Table 1 below. Maximum order of lags for ARDL model is selected as two because annual data are taken for the analysis.

Table 1: Results of Bounds test for Cointegration

ARDL Model	F-Statistic	Outcome
FLGDP(LGDP|LREM,FDI,LINV,LEXP)	34.838	Cointegration
FLREM(LREM|LGDP,FDI,LINV,LEXP)	7.2879	Cointegration
FFDI(LFDI|LREM,LGDP,LINV,LEXP)	6.4691	Cointegration
FLEXP(LEXP|LREM,LGDP,FDI,LINV)	0.8813	No Cointegration
FLINV(LINV|LREM,LGDP,FDI,LEXP)	7.3292	Cointegration

> **The 95% critical bounds of the above models are 2.56 - 3.49**
> **This critical values are based on Pesaran (2000) for k= 4 and n=39.**

Source: Authors computation

These results imply that the null hypothesis of no cointegration can be rejected when GDP, REM, FDI and INV are taken as the dependent variable in each individual model. However, it cannot be rejected when EXP is taken as the dependent variable. Thus, it signifies that economic growth, worker's remittances, foreign direct investment and investment variables have cointegration relationships with other explanatory variables.

After establishing the long run relationship between variables, the long-run coefficients for the equation 2 of the ARDL model are estimated. Results are presented below in the Table 2.

Table 2. Estimated long-run Coefficients using ARDL approach

Regressor	Coefficient	T-Statistic	Probability
LREM	0.5184	2.2956	0.0282
LINV	-2.1425	-1.5242	0.1370
LEXP	-0.5690	-0.5823	0.5643
FDI	-0.2042	-0.3144	0.1977
C	5.8962	2.4691	0.0189

Source: Author's computation

Long-run coefficients of the ARDL model show that only REM variable is significant in explaining the long-run changes of economic growth in Sri Lanka during the period of 1975 to 2015. REM is significant at 5% significance level and indicates that 1% increase in worker's remittances will increase GDP by 0.5%.

The third step of the ARDL model is identifying short-run dynamics of the model using Error Correction Model (ECM). Results are presented in Table 3 below.

Table 3. Error Correction Model for short-run elasticity

Repressors (Dependent variable is LGDP)	Coefficient	T-Statistic	Probability
LREM	0.0302	-2.1958	0.0355
LINV	0.1074	4.1255	0.0002
LEXP	0.0014	0.4853	0.6307
FDI	0.0022	0.9955	0.3269
ECM(-1)	0.0119	2.7420	0.0099

Source: Author's computation

Short-run dynamics of this ARDL model imply that worker's remittances and investment variables have significant short-run relationship with economic growth of Sri Lanka. LREM variable is significant at 5% significant level and LINV variable is significant at 1% level. These results show that the short-run elasticity of remittances on economic growth is 0.0302. Hence, one per cent increase in per capita remittances as a percentage of GDP will increase the economic growth by 0.03%. Investment increases the GDP growth as 1% increase in investment will increase economic growth by 0.1 per cent.

Error correction coefficient is highly significant (p=0.0099) at 1% level. It indicates that there is a strong short-run relationship between economic growth and its explanatory variables in Sri Lanka during the study period. Error correction coefficient is 0.0119 and indicates that approximately 1% of disequilibria of the last year's shock converge back to the equilibrium in the current period. However, a strong relationship could not be found.

Conclusions, implications and significance

The objective of this study is to examine the long-run relationship between worker's remittances and economic growth in Sri Lanka. Findings of the bounds test for cointegration reveals that there exists a significant relationship between economic growth and remittances in Sri Lanka. Higher long run elasticity of remittances to economic growth (0.5184) compared to short run elasticity (0.0302) implies that worker's remittances are favourable for economic growth in the country.

Increasing the potential to earn more remittances would be a significant policy focus in order to achieve a higher economic growth. Households should be directed to spend the received remittances on education of the children and health which will stimulate the growth process by increasing labour productivity.

However, dependency on remittances could not address the fundamental imbalances and consequent economic instability which ultimately setback the economic growth.

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