

## An Empirical Study of the Determinants of Remittances in Transitional Economies

Kunofiwa Tsauro<sup>1</sup>, Chipso Mellania Maseko<sup>2</sup>

**Abstract:** The paper investigated the determinants of remittances in transitional economies using panel data (1997 – 2014) with econometric estimation techniques such as fixed effects, random effects and the pooled OLS. The study found out that FDI and economic growth had a significant negative influence on remittances across all the three econometric estimation methods. Financial development and savings had a significant positive effect on remittances under the fixed and random effects and a significant negative impact on remittances under the pooled OLS approach. Another variable that was also found to have had a significant positive impact on remittances under both the fixed and random effects is inflation, consistent with available theoretical underpinnings. In summary, variables that were found to have a significant influence on remittances include FDI, economic growth, inflation, financial development and savings. Across all the three econometric estimation methods, human capital development and trade openness were found not to have any significant influence on remittances, a finding which contradicts available theoretical and empirical literature.

**Keywords:** Remittances; Transitional Economies; Panel Data

**JEL Classification:** F24; C23; P2

### 1. Introduction

In recent decades, most people have been migrating from one country to the other for to increase their standard of living (Kangmennaang et al., 2018; Haller et al., 2018). This movement is mostly from a developing to a developed country, where the currency exchange is much stronger than the home country. Migration benefits both the host and the home country in different ways, for example in terms of economic and social growth. While migrants gain experience in host country and contribute to its improvement they are also able provide for their families by money their home country. There are many reasons why migrants send money to their countries of origin. According to Nathan (2014), three main motivations for

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<sup>1</sup> Associate Professor, Department of Finance, Risk Management and Banking, University of South Africa, South Africa, Address: P.O. Box 392, UNISA 0003, Pretoria, South Africa, Corresponding author: tsaurk@unisa.ac.za.

<sup>2</sup> Department of Finance, Risk Management and Banking, University of South Africa, South Africa, Address: P.O. Box 392, UNISA 0003, Pretoria, South Africa, E-mail: masekcm@unisa.ac.za.

remitting include altruistic, self-interest and enlightened motive. However, Kangmennaang et al. (2017) argued that larger portion of remittances were mostly spent on the consumption for basic needs.

In a nutshell, there is no more doubt as to the necessity of remittances in stirring economic growth hence the validity of the remittance-led growth hypothesis is no longer disputable. Recent empirical research which agree with remittance-led growth hypothesis were done by Meyer and Shera (2017), Kumar et al (2018), Cismas et al (2019), Osemenshan (2019), Izabela and Sobiech (2019), among others. What is still yet to be known is what must be done to increase remittances inflow and consequently economic growth. That cannot be accomplished if the relevant authorities are not aware of what drives remittance flows. Although there are quite a few studies (Sultonov, 2013; Fonchamnyo, 2012; Akçay, 2018; Bettin and Zazzaro, 2018; Apergis and Cooray, 2018; McCracken et al., 2017; Adenutsi, 2014; Balli and Rana, 2015; Panda, 2015; Coon and Neumann, 2015; Goza and Ryabov, 2010; Ezeoha, 2013) that have investigated the determinants of remittances, none that the authors are aware of focused on transitional economies. It is against this backdrop that the current study investigated the determinants of remittances in transitional economies using panel data analysis.

The available literature (Adenutsi, 2014; Haller et al. 2018; Kangmennaang et al. 2018; Sultonov. 2013; Fonchamnyo. 2012; Apergis and Cooray, 2018; McCracken et al. 2017; Akçay, 2018; Bettin and Zazzaro, 2018; Nathan, 2014) argued that remittances not only trigger economic growth but improves the welfare of the people, enhances human capital development, boosts financial development through accelerating savings and investment. The current study is therefore expected to produce results which helps transitional economies develop remittance inflow enhancement policies.

The rest of the paper is organized as follows: Section 2 is the empirical literature on the determinants of remittances, section 3 explains the theoretical aspect on how various factors influence remittances whilst section 4 details the remittance trends in transitional economies. Section 5 is the research methodological framework, discussion and interpretation of results. Section 6 is the conclusion. Section 7 is the reference list.

## **2. The Determinants of Remittances –Empirical Literature**

Remittances involves the transferring of cash from a foreign country to a country of origin by a migrant worker. In most developing economies, remittances are one of the biggest sources of external income and ranked second after foreign direct investment (Bhattacharya et al., 2018). According to Ecer et al. (2010), remittances are influenced by two mains namely the purpose and the host country. The following

studies on remittances, employed different methodologies over specific periods in different countries to determine the determinants of remittances.

Sultonov (2013) employed quarterly time series data from 2003q1 -2011q4 to determine the determinants of remittance flows from Russia to Tajikistan. He contended that global economic environment and the economic environment of both the host and home countries has an influence on remittance inflows. Remittances can also be determined from an individual and personal level, and not only from the global and economic environment. Fonchamnyo (2012) attempted to assess the altruistic motive of remittance using an unbalanced panel of 36 economies in Sub Saharan African Region. He argued that on an individual level, the Catholics population was encouraged to remit; therefore, religion had an influence on remittances. Even though the level of per capita income of the home country was negative.

Akçay (2018) employed the bounds testing method and used data from 1975 to 2011, to test long run relationship between remittances and misery index in Turkey. Akçay (2018) argued that they were a relationship between the two, this was because of positive impact on remittance that showed on the misery index in both short and long run relationships in his results. Therefore, whether remittances are of a short or long-term nature, there is misery associated with them. However, more misery maybe expected in times of natural disasters according to Bettin and Zazzaro (2018). Bettin and Zazzaro (2018) investigated the impact of natural disasters on remittances using novel empirical evidence on a panel 98 countries over a period of 1990-2010. They argued that remittances increased after natural disasters and that remittances played a major role in terms of ex ante risks.

Apergis and Cooray (2018) investigated the asymmetric effect of real exchange rate changes and the role of remittances on poverty, using a threshold partial adjustment-modelling approach and 99 countries from the periods of 1980-2015. Their results indicated a strong positive outcome that real exchange rate depreciations had on poverty. Their conclusion on exchange rate was inconsistent with Yuni et al. (2013), who found an inversely related relationship between the two. Yuni et al. (2013) investigated the determinants of remittance across 21 African countries using GMM estimation in a dynamic panel. They found that broad money growth tax revenue, GDP per capita and real effective exchange rate were inversely related to remittance receipt, lending rate, age dependency ratio and inflation were positively related.

McCraken, Ramlogan-Dobson and Stack (2017) investigated the gravity of remittance in 27 Latin America and Caribbean countries and 18 industrialised countries using a microeconomic model of the motivation of remittance. They found that a combination of altruism and self-interest was the motivation of remittances. Their study was consistent with the study by Guetat and Sridi (2017) who also found altruistic as a motivation factor among MENA migrants. Guetat and Sridi (2017) had

carried out a study of 15 Middle East and North Africa (MENA) with data from a period of 1984-2011 using generalised method of moment. On the other hand, a national sample survey of between the periods of 2007 and 2008 employed by Mahapatro (2017) to examine factors influencing remittances in India using the heckman's two-stage procedure. He concluded that the behaviour of both genders had that monthly per capita expenditure, distance from origin and duration of stay at destination were the most predictors of remittance.

Using panel and random effect model with data from 1990 to 2013, Abbas and Mohammad (2016) explored economic determinants of remittance flow to Pakistan from 12 major markets. They found both negative and positive effects of remittances. On the positive effects of remittances, productivity growth of the recipient country and level of income of originator country, were the major reasons while on the negative, they found distance between the two countries to be a hindrance when remitting. Therefore, distance comes with higher transactional costs as conclude in another study on remittance from Pakistan was by Ahmed and Martinez-Zarzoso (2016) who used bilateral data on remittance flows to Pakistan for 23 major host countries to investigate whether transfer costs matter for foreign remittances. They argued that there was a negative and significant effect of transaction costs on remittance flow. Therefore, the existence of migrant networks as well as the improvements of financial services in both countries resulted in better and faster facilitation of remittances.

Al-Assaf and Al-Malki (2014), employed ARDL and VECM to investigate macroeconomic factors in both home and host countries that affected remittances in Jordan for the period of 1972 -2009. According to Al-Assaf and Al-Malki (2014), the most significant factors were the macroeconomic factors of host countries rather than those of home country, as well as external rather than internal factors. In another study from a Jordan perspective, Bashier (2016) investigated the impact of remittances on import demand function in Jordan and employed ARDL bond testing approach over the period of 1975-2016. In addition to remittance, their study also investigated relationships in aggregate port demand function and macroeconomic determinants. His results indicated that policies directed to investments were the most implemented. Policies such as inflation reduction increase the level of economic activities and promote remittances inflow. The two studies are inconsistent with each other as one argued for external factors while the other for internal factors.

Islam and Nasrin (2015) investigated the driving forces of remittance inflow in Bangladesh using annual data of periods 1977 - 2011. They argued that significant factors that influenced remittance inflows included gross domestic product of host country and domestic country, exchange rate, petroleum price and skill of labour. Their study was consistent with Al-Assaf and Al-Malki (2014) and Sulonov (2013)'s study. On the other hand, another Bangladesh study from Arun and Ulku

(2011) investigated the determinants of remittances using random sampling strategy from 700 Indian, Pakistan and Bangladesh living in Manchester. They concluded that income, employment, education, linkages to home country and host country were important determinants of remittances.

Adenutsi (2014) employed generalised method of moments on a dynamic panel data of 36 countries in Sub Saharan African over the period of 1980 – 2009 to identify macroeconomic determinates of remittance. He asserted that the host country's macroeconomic conditions influenced inflows of remittances and that permanent migrant were less altruistic than temporary ones. However, between skilled and unskilled labour force, skilled labour remitted smaller amounts than unskilled labour. Kumar et al. (2018) utilised 1980-2012 data to explore the effect of total factor productivity and the presence of long-run association between remittances in Bangladesh and India using a number of tests. They identified two different tipping points of remittances and argued that there was a threshold of effects on TFP growth in both countries. Balli and Rana (2015) employed a large sample of 86 developing countries for the period of 1990-2010 to determine risks of sharing through remittances. He argued that remittance inflows are very important channels through which risk sharing took place

Panda (2015) used panel data analysis and methodologies viz pooled OLS, fixed and random effects model to investigate the determinants of remittances during the periods of 1919 -2012 on a panel of 24 emerging and developing economies. A redundancy and Hausman test found that, both the host and home countries macroeconomic factors influenced the magnitude of remittances. While Coon and Neumann argued that remittance was strongest in low-income countries. Coon and Neumann (2015) had investigated remittance in respect of FDI inflows from a panel of 118 countries between 1980 -2010.

Goza and Ryabov (2010) probed remittance activities in Brazil, US and Canada between 1990 and 1991 through a comparative study. They argued that most immigrants had similar views concerning socio-economic measures and attributed this to their experiences in countries of origin. However, new arrivals of immigrants had different views on certain issues. Ulku (2012) used novel data from 589 households in Berlin of Turkish migrants. He reasoned remittances as a combination of self-interest and tempered altruism. Goschini et al. (2011), made use of a database of 1 514 Romanian immigrants from 55 countries from an online survey which was conducted between August – December 2010. They argued that migrant's income and the intention to return home were the two factors that affected remittances.

Ezeoha AE (2013) employed panel data from 1995 to 2009 covering 32 countries in the SSA. He claimed that weak financial infrastructure was the limiting factor to inflow of remittance and concluded that the higher the level of a country's infrastructure development the greater the impact on remittances. A pooled mean

group (PMG) estimator on a panel of 15 labour sending Asian countries employed by Ngoma et al (2018) to investigate domestic conditions on inflow of workers remittance over the period of 1984-2011. They maintained that interest rate differentials, exchange rate depreciation and financial sector development between home and destination country positively encouraged remittances flows.

### 3. Other Factors Affecting Remittances–Thoeretical Literature

**Table 1. Other Factors Affecting Remittances –Theoretical literature**

Variable	Theory	Source	Expected +/-
Education	According to Bredtman et al. (2018), highly educated migrants receive higher wages, and this gives them an opportunity to send money to their home countries. On the other hand, Goschin et al. (2011) and Goza & Ryabov (2012) argued that highly educated migrants drove taxis, cleaned homes and washed dishes due to difficulties that included lack of skills transfer.	(Bredtman et al. 2018) Goschin et al (2011) Goza & Ryabov (2012)	+/-
Employment status	Proposed changes due to the host country's GDP growth may result in difficulties for migrants to get employment (Sultonov, 2018). According to Carling & Hoelscher (2013), there is less ability to handle different kinds of expenses among the unemployed migrants.	Sultonov (2018) Carling & Hoelscher, (2013)	+/-
Foreign direct investment (FDI)	A study by Coon and Neumann (2015) observed that FDI inflows had a significant positive influence on remittances. On the other hand, FDI inflows boosts economic growth in the host country thereby attracting the citizens who had initially left the country to come back home.	Coon and Neumann (2015)	+/-

Exchange rate	When the exchange rate increases, it results in increased purchase price (Islam & Nasrin, 2015; Abbas et al. 2016). On the other hand, Apergis & Cooray (2018) argued that an increase in exchange rates results in high poverty levels.	Islam & Nasrin, 2015; Abbas <i>et al.</i> (2016) Apergis & Cooray (2018)	+/-
Financial development	It is easier and cheaper to transfer money when there are improvements in the financial sector of the home country (Fonchamnyo, 2012; Ahmed & Zarzozo, 2016 and IMF, 2005). On the other hand, Arezki & Brückner, (2011) argued that to reduce the reliance on external sources of income, an increase of the availability of credit in home country was necessary.	Fonchamnyo (2012) (Arezki & Brückner, 2011)	+/-
Economic growth	For both the host and home countries, welfare and investment opportunities are the most important indicators for economic growth. However, according to Driffield & Jones (2013), countries that experience growth are those that are continuously able to maintain a high level of law and order and protect investors.	Guetat & Sridi (2017) (Driffield & Jones, 2013)	+/-
Inflation	According to Guetat & Sridi (2017) when the inflation rate is high, life becomes more difficult because inflation causes lack of price stability.	Guetat & Sridi (2017) Nisar & Tufail (2013)	+/-
Interest rate	Interest rates fluctuations are affected by the macro conditions in home country (Guetat & Sridi, 2017; Fonchamnyo 2012) Sulstonov (2018) argued that migrants prefer to keep their savings out of the banks because of lack of	Guetat & Sridi (2017) Sulstonov (2018)	+/-

	knowledge and mistrust in banking systems.		
Openness	Greater openness brings about structural changes however, a government's reaction to any anti-market policies will be either positive or negative in assisting its people in coping with such changes (Narayan et al. 2011).	Narayan et al. (2011)	+/-
Politics & instability	In times of political uncertainties and disasters, migrants tend to show empathy for those people left behind in-home country (Koczan 2016; Ahmed & Zarzozo. 2016; McCracken <i>et al.</i> 2017)	Koczan (2016) Ahmed & Zarzozo (2016) McCracken et al. 2017)	+/-
Savings	To safeguard their future, migrants who plan to return to their home countries tend to save and invest more in their home countries (Bettin & Lucchetti, 2015 and Coon & Neuman, 2015). However, according to Baldé (2011), undeveloped markets led to migrants saving less.	Bettin & Lucchetti (2015). Coon & Neuman (2015). Baldé (2011)	+/-

*Source: Authors' compilation*

#### 4. Remittance Trends in Transitional Economies

Table 2 shows the averages of savings, human capital development, foreign direct investment, exchange rates, inflation, financial development and trade openness during a 21-year period ranging from 1995 to 2015.



**Table 2. Remittances Trends in Transitional Markets (1997-2014)**

	REMIT	FDI	GROWTH	INFL	OPEN	HCD	FIN	SAV
<b>Africa</b>								
South Africa	0.24	1.71	5 147.21	6.04	56.77	0.66	200.70	19.39
<b>Europe</b>								
Czech Republic	0.66	5.10	13 903.76	3.21	116.74	0.86	19.41	30.66
Portugal	0.68	3.75	18 083.85	2.44	67.47	0.85	38.16	16.07
Russia	0.38	2.32	7 003.98	16.82	55.58	0.78	46.31	31.19
Turkey	0.73	1.47	7 156.45	28.38	50.11	0.74	29.06	16.99
Greece	0.90	0.73	20 876.85	3.17	53.58	0.88	50.15	12.90
Poland	1.40	3.48	8 957.18	4.52	72.98	0.83	26.38	19.12
<b>Asia</b>								
China	0.23	3.63	2 948.31	2.68	47.20	0.71	44.49	45.57
Hong Kong	0.12	23.15	29 633.53	2.88	358.81	0.89	694.95	29.95
Thailand	1.12	3.32	3 608.90	3.09	123.66	0.74	59.26	30.89
Indonesia	0.96	1.55	1 865.36	10.95	58.43	0.68	32.14	30.78
India	3.11	1.42	887.67	7.12	39.33	0.57	59.80	28.35
Malaysia	0.50	3.39	6 669.56	2.47	184.47	0.78	136.84	41.84
Philippines	10.60	1.47	1 616.12	4.78	86.61	0.70	52.20	15.98
Republic of Korea	0.71	0.99	17 950.83	3.09	80.74	0.88	65.69	33.92
<b>Latin America</b>								
Argentina	0.13	2.38	8 625.30	8.13	31.11	0.82	15.44	21.10
Brazil	0.24	3.03	6 954.31	6.30	24.37	0.75	46.95	18.88
Colombia	1.77	3.55	4 405.04	6.91	36.00	0.74	34.71	17.86
Mexico	1.95	2.65	7 880.93	6.93	56.23	0.78	29.47	21.05
Peru	1.58	3.99	3 622.90	3.32	43.93	0.74	36.99	22.73
<b>Overall mean</b>	<b>1.40</b>	<b>3.65</b>	<b>8 889.90</b>	<b>6.66</b>	<b>82.21</b>	<b>0.77</b>	<b>85.95</b>	<b>25.26</b>

Source: Author's calculations based on the World Development Database

India, Philippines, Colombia, Mexico and Peru are the only countries whose mean personal remittances exceeded the overall mean personal remittances of 1.40% of GDP. Philippines and India are outliers because their mean personal remittances far much exceeded the overall mean personal remittances level. In terms of FDI, Czech Republic, Portugal, Hong Kong and Peru had their mean FDI above the overall mean of 3.65% of GDP. Hong Kong is the only outlier in as far as FDI variable is concerned.

In terms of economic growth, South Africa, Czech Republic, Portugal, Greece, China, Hong Kong, Thailand, Indonesia, India, Philippines, Republic of Korea, Colombia and Peru are the outliers because their mean GDP per capita far much

deviates from the overall mean GDP per capita of US\$8 889.90. Russia, Turkey and Indonesia are the outliers in as far as inflation figures is concerned whilst Hong Kong and Malaysia are the outliers when it comes to trade openness. With regards to human capital development, there is no outlier as all the mean human capital development for all the countries studied revolve around the overall mean human capital development index.

The mean financial development of South Africa, Hong Kong, and Malaysia exceeded the overall mean financial development of 85.95% of GDP during the period under study. The same countries were also outliers because their mean financial development far much exceeded the overall mean financial development of 85.95% of GDP. With regards to savings, South Africa, Portugal, Turkey, Greece, Poland, Philippines, Argentina, Brazil, Colombia, Mexico and Peru are the countries whose mean savings ratios were lower than the overall mean savings ratio of 25.26% of GDP. Greece and China are the outliers given the huge gap between their mean savings ratios and the overall mean savings ratio of 25.26% of GDP.

## 5. Research Methodology

**5.1. Data and its sources:** The study used panel data ranging from 1997 to 2014 to investigate the determinants of remittances in transitional economies. International Financial Statistics, United Nations Conference on Trade and Development, International Monetary Fund (IMF), Global Financial Indicators, World Development Indicators and United Nations Development Programme various reports are the sources of secondary data which were used for the purposes of the study. Transitional economies used for this study include Argentina, Brazil, China, Colombia, Czech Republic, Greece, Hong Kong, Indonesia, India, Mexico, Malaysia, Peru, Philippines, Poland, Portugal, Republic of Korea, Russia, Thailand, Turkey and South Africa.

**5.2. Pre-estimation diagnostics:** Descriptive statistics and correlation analysis were done as part of pre-estimation diagnostics (see results in Table 3 and 4).

**Table 3. Descriptive Statistics**

	REMIT	FDI	GROWTH	INFL	OPEN	HCD	FIN	SAV
Mean	1.40	3.65	8 890	6.66	82.21	0.77	85.95	25.26
Median	0.62	2.51	6 21	4.19	57.78	0.77	39.22	22.12
Maximum	13.32	39.87	40 170	85.74	455.28	0.94	1 254	51.46
Minimum	0.02	0.03	421.8	0.11	16.44	0.48	5.67	8.33
Standard deviation	2.31	5.39	8 175	10.27	76.12	0.09	169.0	9.24
Skewness	3.46	4.55	1.38	5.42	2.98	-0.36	4.97	0.68
Kurtosis	15.21	25.65	4.35	36.96	12.69	2.77	29.50	2.91
Jarque-Bera	2 957	8 935	141.0	19 058	1 942	8.58	12 018	27.66
Probability	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Observations	360	360	360	360	360	360	360	360

Source: Author Compilation from E-Views

From Table 3, economic growth and financial development variables have got extreme values because their standard deviation exceeds 100. The probability values for the Jarque-Bera criterion is nil across all the variables studied, an indication that the data sets involved is not normally distributed. All variables except human capital development are skewed to the right. Finally, the range values for economic growth, trade openness, and financial development is above 100, another evidence that these variables are characterized with abnormal values.

**Table 4. Correlation analysis**

	REMIT	FDI	GROWTH	INFL	OPEN	HCD	FIN	SAV
REMIT	1.00							
FDI	-0.16***	1.00						
GROWTH	-0.31***	0.52***	1.00					
INFL	-0.01	-0.14**	-0.22***	1.00				
OPEN	-0.07	0.79***	0.56***	-0.15***	1.00			
HCD	-0.28***	0.29***	0.69***	-0.15***	0.36***	1.00		
FIN	-0.12**	0.84***	0.53***	-0.11**	0.83***	0.21***	1.00	
SAV	-0.25***	0.14***	-0.09*	-0.09*	0.32***	-0.06	0.13**	1.00

Note: \*\*\*/\*\*/\* denotes statistical significance at the 1%/5%/10% level respectively.

Source: Author compilation from E-Views

Variables such as foreign direct investment, economic growth, human capital development financial development and savings were each found to be negatively but significantly related with remittances (see Table 4). Inflation and trade openness

were both each observed to have a non-significant negative relationship with remittances. These results support the available literature on the determinants of remittances which says that foreign direct investment, inflation, human capital development, savings, economic growth, trade openness and financial development can either have a positive or negative influence on remittance inflows (refer to section 3).

**General Model and Econometric Specification:** The following general model specification formulated using available literature (see section 3) on the determinants of remittances relates to the current study.

$$\text{REMIT} = f(\text{FDI}, \text{GROWTH}, \text{INFL}, \text{OPEN}, \text{HCD}, \text{FIN}, \text{SAV}) \quad [1]$$

Where REMIT, FDI, GROWTH, INFL, OPEN, HCD, FIN and SAV stands for personal remittances, foreign direct investment, economic growth, inflation, trade openness, human capital development, financial development and savings respectively.

The econometric equation representing the determinants of personal remittances is shown below.

$$\text{REMIT}_{it} = \beta_0 + \beta_1 \text{FDI}_{it} + \beta_2 \text{GROWTH}_{it} + \beta_3 \text{INFL}_{it} + \beta_4 \text{OPEN}_{it} + \beta_5 \text{HCD}_{it} + \beta_6 \text{FIN}_{it} + \beta_7 \text{SAV}_{it} + \varepsilon_{it} \quad [2]$$

Where  $\text{REMIT}_{it}$  is the net personal remittances received as a ratio of GDP in country  $i$  at time  $t$ ,  $\text{FDI}_{it}$  represents net FDI inflows as a ratio of GDP in country  $i$  at time  $t$ ,  $\text{GROWTH}_{it}$  is gross domestic product in country  $i$  at time  $t$ ,  $\text{INF}_{it}$  stands for inflation in country  $i$  at time  $t$ ,  $\text{OPEN}_{it}$  is trade openness in country  $i$  at time  $t$  whilst  $\text{HCD}_{it}$  represents human capital development in country  $i$  at time  $t$ .  $\text{FIN}_{it}$  is financial development in country  $i$  at time  $t$ .  $\text{SAV}_{it}$  represents gross domestic savings in country  $i$  at time  $t$ .  $\varepsilon_{it}$  is the error term and  $\beta_0$  is the intercept.  $\beta_1$  to  $\beta_7$  are the coefficients of the explanatory variables.

**Table 5. Variables, Proxy Used and Data Sources**

<b>Variable</b>	<b>Proxy used</b>	<b>Source(s) of data</b>
Personal remittances (REMIT)	Personal remittances received (% of GDP)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Foreign direct investment (FDI)	Net FDI inflow (% of GDP)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Economic growth (GROWTH)	GDP per capita	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Inflation (INFL)	Inflation, consumer prices (annual %)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Trade openness (OPEN)	Total trade (% of GDP)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Human capital development (HCD)	Human capital development index	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Financial development (FIN)	Stock market capitalization (% of GDP)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.
Savings (SAV)	Gross domestic savings (% of GDP)	United Nations Development Programme various reports, World Development Indicators and African Development Bank databases.

*Source: Author compilation*

**Panel unit root tests and co-integration.** Table 6 shows that all the variables were stationary at first difference, evidence that all the variables are integrated of order 1.

**Table 6. Panel Root Tests –Individual Intercept**

Level	LLC	IPS	ADF	PP
LREMI	-3.3216***	-2.0916**	57.6806**	81.7922***
LFDI	-5.6589***	-4.4102***	84.4933***	132.947***
LGROWTH	-0.7695	3.0504	14.4224	9.2544
LINFL	-5.3570***	-4.5103***	87.5783***	97.4437***
LOPEN	-2.2243**	0.1160	39.4780	41.3200
LHCD	-10.0908***	-6.5303***	112.961***	159.216***
LFIN	-3.6753***	-2.1405**	57.8585**	124.669***
LSAV	-3.8213***	-3.1651***	79.6407***	72.1597***
First difference				
LREMI	-4.6925***	-5.4591***	98.1315***	206.407***
LFDI	-11.3408***	-12.8582***	215.159***	1829.83***
LGROWTH	-5.0147***	-5.6224***	100.411***	242.417***
LINFL	-15.9794***	-14.0830***	233.518***	537.912***
LOPEN	-9.4320***	-8.2471***	141.595***	617.861***
LHCD	-16.3071***	-13.5165***	227.054***	1639.90***
LFIN	-13.7435***	-12.9319***	216.639***	888.720***
LSAV	-9.7039***	-8.5791***	144.658***	467.823***

Note: LLC, IPS, ADF and PP stands for Levin, Lin and Chu (2002); Im, Pesaran and Shin (2003); ADF Fisher Chi Square and PP Fisher Chi Square tests respectively. \*, \*\* and \*\*\* denote 10%, 5% and 1% levels of significance, respectively.

Source: Author’s compilation from E-Views

**Table 7. Kao Residual Co-integration Test - Individual Intercept**

	T-statistic	Probability
Augmented Dickey-Fuller (ADF)	-5.2696	0.0000

Source: Author’s compilation from E-Views

According to Table 7, the null hypothesis which says that there is no long run relationship between the variables studied is rejected at 1% level of significance, thus clearing way for main data analysis.

**Table 8. Panel Regression Results – The Remittances Function**

	Fixed effects		Random effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
FDI	-0.1208***	-3.1760	-0.1287***	-3.4145	-0.2303***	-3.9277
GROWTH	-0.1782***	-3.0794	-0.1907***	-3.4411	-0.5456***	-6.5942
INFL	0.1050***	2.9587	0.1110***	3.1764	-0.0303	-0.5103
OPEN	0.2269	1.5264	0.1915	1.3971	0.8166***	6.8169
HCD	0.2611	0.5262	0.1072	0.2256	-1.1686	-1.6402
FIN	0.1369**	2.1811	0.1426**	2.3519	-0.2293***	-3.0766
SAV	1.0797***	5.2595	0.8908***	4.6205	-0.9352***	-5.6593
Adjusted R-squared	0.8611		Adjusted R-squared	0.5948		
F-statistic	86.6186		F-statistic	31.3902		
Prob (F-statistic)	0.0000		Prob (F-statistic)	0.0000		

Source: Author compilation from E-Views (8)

\*\*\*/\*\*/\* indicate 1%, 5% and 10% significance levels respectively

Across all the three econometric estimation techniques (fixed effects, pooled OLS, random effects), FDI was found to have had a significant negative impact on remittances, a finding that is consistent with Coon and Neumann (2015) whose study noted that increased FDI inflows enhances economic growth in the host country thereby providing a reason for the emigrants who had initially left their country to come back home. Economic growth in the host country also had a significant negative effect on remittances under the fixed effects, random effects and the pooled OLS. The theoretical explanation is that no citizen would be interested in leaving a country whose economy is stable and growing whilst emigrants are likely to return to their mother country if the economy of the labour sending country improves (all factors remaining constant).

According to fixed and random effects approaches, inflation had a significant positive influence on remittances, a finding which resonates with Guetat and Sridi (2017) whose study argued that when inflation rate is high, life becomes more difficult because inflation causes lack of price stability thus triggering the departure of citizens from their country to look for greener pastures. In contradiction to literature that is available, pooled OLS noted that inflation had a non-significant negative effect on remittances.

According to the fixed and random effects, trade openness had a non-significant positive influence on remittances whilst pooled OLS shows that the impact of trade

openness on remittances was positive and significant. These findings are in line with Narayan et al (2011). Pooled OLS method produced results which shows that human capital development had a non-significant negative influence on remittances in support of an argument by literature which says that highly educated and skilled earn enough money to permanently emigrate with all their immediate family therefore eliminating the need to remit cash back home. On the other hand, human capital development had a non-significant positive impact on remittances under the fixed and random effects methods. The finding resonates with literature which says that highly skilled and educated emigrants earn, save, invest and remit more money back to their relatives and friends who remained in the home country.

In line with an argument by Fonchamnyo (2012) and Ahmed and Zarzozo (2016) whose studies observed that it is easier and cheaper to transfer money when there are improvements in the financial sector of the home country, financial development had a significant positive influence on remittances under both fixed and random effects. Pooled OLS produced results which show that financial development had a significant deleterious effect on remittances, in contradiction to the available literature.

Fixed and random effects show that savings had a significant positive influence on remittances, in line with Bettin and Lucchetti (2015) and Coon and Neuman (2015) whose studies noted that to safeguard their future, migrants who plan to return to their home countries tend to save and invest more in their home countries. Yet savings were found to have had a significant negative impact on remittances under the pooled OLS, results which are at variance with existing literature on savings-remittances nexus.

## 6. Conclusion

The paper investigated the determinants of remittances in transitional economies using panel data (1997 – 2014) with econometric estimation techniques such as fixed effects, random effects and the pooled OLS. The study found out that FDI and economic growth had a significant negative influence on remittances across all the three econometric estimation methods. Financial development and savings had a significant positive effect on remittances under the fixed and random effects and a significant negative impact on remittances under the pooled OLS approach. Another variable that was also found to have had a significant positive impact on remittances under both the fixed and random effects is inflation, consistent with available theoretical underpinnings. In summary, variables that were found to have a significant influence on remittances include FDI, economic growth, inflation, financial development and savings. Across all the three econometric estimation methods, human capital development and trade openness were found not to have any



significant influence on remittances, a finding which contradicts available theoretical and empirical literature.

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