

The Role of Liquidity in the Remittances-Human Capital Development Nexus in Emerging Economies

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Abstract: The objectives of this paper are threefold: Firstly, to investigate the impact of remittances on human capital development. Secondly, to explore the influence of stock market liquidity on human capital development. Thirdly, to study the influence of the interaction between remittances and stock market liquidity on human capital development in emerging markets using panel data analysis. To a larger extent, migrants' personal remittances had a positive impact on human capital development whilst stock market liquidity was found to have had a negative influence on human capital development. Though the results are not uniform across the three panel data analysis methods, the interaction between stock market liquidity and remittances had a negative effect on human capital development. The finding means that the presence of high stock market liquidity in emerging markets had a deleterious effect on remittances' ability to enhance human capital development. The study therefore urges emerging markets to implement policies that keeps stock market liquidity at minimal levels in order to enhance migrant personal remittances' impact on human capital development. Future studies should investigate other channels which facilitate migrant remittances' influence on both human capital development and economic growth.

Keywords: Remittances; Human Capital Development; Liquidity; Emerging Markets

JEL Classification: J24

1. Introduction

Background of the Study: According to Taylor et al. (1996), remittances are to a larger extent the largest form of contribution that migrants make to the economic growth and development of their home countries. This assertion has been investigated by many recent researchers (Salahuddin & Gow, 2015; Oshota & Badejo, 2015; Rahman, 2014; Shafqat et al., 2014) and their findings overwhelmingly support the remittances-led growth hypothesis. In other words, the impact of remittances on economic growth is no longer a contestable matter in

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finance, economics and migration. Other empirical researchers have argued that remittances influence economic growth through its positive effect on human capital development (Mesnard, 2001; Mesnard, 2004). What is still evidently not yet conclusively investigated is the impact of remittances on human capital let alone the macroeconomic environment that must be in the labour sending country before remittances influence human capital development.

Few empirical studies that focused on the relationship between migrant remittances and human capital development produced results which are conflicting, mixed and divergent. The results from prior empirical work on remittances-human capital development nexus can be divided into three categories: (1) remittances-led positive human capital development, (2) remittances-led negative human capital development, (3) strong economic governance system has to be in place in the labour sending country before remittances can enhance human capital development. These contradictions in the literature is evidence that the debate on remittances-human capital development nexus is far from being settled. To the best of the author's best knowledge, there is no study so far that has attempted to investigate whether stock market liquidity (one of the indicators of the strength of the governance system) is a condition that must be available in the labour sending country before human capital development triggered by remittances is realised. It is against this backdrop that the current study is exploring if stock market liquidity influences remittances' impact on human capital development in emerging markets. The findings from the study helps emerging markets to develop stock market development and migrants' remittance policies which enhances not only human capital development but economic growth as well.

Problem Statement and Research Gap: Empirical research work on remittances-human capital development nexus is scant. Prior empirical work on the subject matter focused on Pakistan, Senegal, Latin American countries, Sub-Saharan Africa, developing countries, Philippines, Nepal, Morocco, Middle income countries, Ghana, lower, middle and high income countries. Most notably, no single study has so far been dedicated on emerging markets as a bloc of countries despite the fact they have been characterized by rapid economic growth and unprecedented inflows of FDI which according to Romer (1986) is normally accompanied by human capital development. Majority of the similar previous studies were narrow focused because they used education or health proxies for human capital development, whose major weakness is that they exclude skills aspect of human capital development. These related empirical studies on remittances-human capital development nexus ignored the fact that the relationship between the two variables may be non-linear, consistent with Azam and Raza (2016) whose study noted that remittances had a significant positive impact on human capital development on condition that a strong economic governance system is in place in the labour sending country.

Contribution of the Study: This paper deviates from prior empirical studies on remittances-human capital development nexus in the following ways: (1) uses human capital development index, which is more accurate because it broadly includes all the three major aspects of human capital development such as education, health and skills, (2) focused on emerging markets as a unit of analysis and (3) according to the author's best knowledge, this study is the first of its kind to investigate the role of stock market liquidity in the remittances-human capital development nexus.

Organization of the Paper: To answer the question on whether stock market liquidity in the labour sending country enhances remittances led human capital development, the current paper is organized as follows: Section 2 discusses the theoretical literature on the impact of remittances on human capital development. Section 3 is the empirical literature on the influence of remittances on human capital development. Section 4 is the research methodology, results discussion and interpretation. Section 5 concludes whilst section 6 is the reference list. Section 7 is the appendix section.

2. Remittances on Human Capital Development-Theoretical Literature Review

There are three dominant theoretical rationales which explains the impact of migrant remittances on human capital development, namely (1) the remittances-led positive human capital development, (2) the remittances-led negative human capital development and (3) the non-linear hypotheses.

Consistent with Acharya and Leon-Gonzalez (2014), remittances enable households to invest more in education and health of the children. The same study argued that increased investment towards education of children brings children who are out of school due to financial constraints back to school and prolong the number of years children attends school and thereby consequently reducing child labour. Parental absence due to migration means parents cannot actively participate in the allocation of their children's study time and that may have negative consequences on their children's school achievements (Acharya and Leon-Gonzalez. 2014, p. 446). According to Mansuri (2006), the reallocation of resources between education and other forms of expenditure occurs as the households remaining in the labour sending country tries to shift the responsibilities of the migrant parents to someone else available. This normally results in the underfunding of the children's education despite the constant inflow of remittances from the migrant parents.

According to the non-linear hypothesis, there are certain factors that have to be available before remittances can effectively influence human capital development. The view was propounded by Azam and Raza (2016), Acharya and Leon-Gonzalez

(2014) and Ustubici and Irdam (2012), among others. For example, Ustubici and Irdam (2012) noted that remittances can only enhance human capital development if it is part of the government labour exporting strategy. Azam and Raza (2016) argued that a strong economic governance system has to be available in the labour sending country in order to trigger remittance-led human capital development benefits. Acharya and Leon-Gonzalez (2014) espoused that remittances cannot enhance adequate human capital development in the labour sending countries if the migrant parents are not well educated and have inadequate knowledge. According to Becker (1993), less educated migrant parents tend to under invest in the education of their children who remained in the country of origin.

3. Remittances and Human Capital Development-Empirical Literature Review

Asad et al (2016) investigated the relationship between workers' remittances, unemployment, labour migration, economic growth and human capital development using Multivariate and Bivariate co-integration approach in Pakistan. Their study revealed that there is a long run relationship between workers' remittances, unemployment, labour migration, economic growth and human capital development in Pakistan. Yang (2005) observed that workers' remittances enhanced human capital development (child labour reduction, increased expenditure on education and schooling) in the households of the labour sending countries. Calero et al (2009) examined the interrelationship between remittances, liquidity constraints and human capital development in Ecuador using household survey data ranging from 2005 to 2006. They found out that remittances inflow reduced liquidity constraints especially in the rural areas thereby increasing school enrolment and overall human capital development into Ecuador. The results resonate with Naanwaab and Yeboah's (2013) findings whose study revealed that migrant remittances remove the liquidity constraints among the remaining households in the labour sending countries thereby allowing them to invest in education.

Using cross sectional data analysis, Naeem and Arzu (2017) studied the relationship between remittances and human capital development in developing countries. They noted that remittances and human capital development were positively but non-significantly related in the developing countries (China, Iraq, Turkey, Bangladesh, Pakistan, Afghanistan) studied. Adenutsi (2010) explored the relationship between international remittances and human capital development in the poor Sub-Saharan African countries using panel data analysis with annual data ranging from 1987 to 2007. A significant positive causality relationship running from remittances towards human capital development was detected in the Sub-Saharan African countries in the long run.

The relationship between remittances, education expenditure and economic growth in Philippines was investigated by Abdellatif et al (2013) using the autoregressive distributive lag (ARDL) approach with time series data ranging from 1984 to 2009. Expenditure in education was found to have been positively driven by remittances inflow in Philippines. The same study also revealed that the interaction between remittances and expenditure in education was instrumental in enhancing economic growth in Philippines. Bansak and Chezum (2009) explored the relationship between remittances, absenteeism on household decisions and human capital development using household survey data in Nepal. The findings are twofold: Young girls' education was negatively affected by the parents' absence triggered by migration more than young boys. On the contrary, absence of parents due to migration had a positive effect on older girls' and boys' education.

Bouoiyour and Miftah (2016) studied the influence of migrant's remittances on human capital accumulation in Morocco using household survey data. Their findings are threefold: (1) remittances significantly reduced the probability of no schooling for young girls, (2) child labour significantly went down in response to increased remittances inflow and (3) the probability of school drop out for children drastically decreased due to the inflow of remittances into Morocco. Using three-stage least squares regression analysis, Naanwaab and Yeboah (2013) explored the impact of migrant remittances on human capital development in 71 developing countries. They found out that migrant remittances had a significant positive influence on healthcare and educational spending in the developing countries studied.

Salas (2014) explored the impact of international remittances on human capital development in Peru. More specifically, the study investigated whether international remittances had an influence on whether to send children to a private or public school in Peru. The study found out that international remittances increased the likelihood to send children to private schools and general human capital development in the labour sending country (Peru). The findings resonate with Ustubici and Irdam's (2012) study which found out that remittances had a significant positive effect on human capital development in middle income countries in the medium term. In the case of a study by Ustubici and Irdam (2012), remittances' positive effect on human capital development was more prevalent especially in countries where migration is part of the governments' labour exporting strategy.

Using panel data analysis with annual data ranging from 1996 to 2013, Azam and Raza (2016) studied the impact of remittances on human capital development in 17 countries (lower, middle and high income). Their study noted that remittances had a significant positive impact on human capital development in the 17 countries. Moreover, they found out that strong economic governance system enhanced remittances' positive influence on human capital development. It is against this background that the current study investigated the impact of stock market liquidity

(one of the indicators of the strength of the economic governance system) on remittance's influence on human capital development in emerging markets.

Using instrumental variables approach, Ganyo (2013) investigated the impact of remittances on human capital development in Ghana. The study observed that remittances increased human capital development in Ghana through enhancing (1) school enrolment and (2) the number of children who successfully completes primary and high school education. A study by Acharya and Leon-Gonzalez (2014) on the relationship between remittances and human capital development produced mixed findings. Firstly, remittances helped those households who face less liquidity constraints to channel more resources towards quality education. Secondly, remittances enabled credit or liquidity constrained households to send their children to school and avoid drop outs. Thirdly, the children of less educated and less informed parents are the ones who benefit more from remittances. Fourthly, the disadvantages of migration (parental absence) far much outweighed the advantages of migration in the case of children of more educated and informed parents.

Acosta et al (2007) studied the influence of remittances on human capital development and poverty alleviation in 11 Latin American countries using cross sectional data analysis. Their findings support the remittances-led human capital development (education and health) hypothesis. In the case of Senegal, a study by Ndiaye et al (2016) also produced findings which resonate with the remittances-led human capital development (education and health) hypothesis. The same study done by Ndiaye et al (2016) noted that remittances inflow into Senegal had a negative impact on the labour market participation of household members with migrants, evidence that the remaining relatives in the labour sending country tend to over depend on remittances. The findings were supported by Belmimoun et al (2014) whose study observed a negative causality relationship running from remittances towards economic growth in Algeria.

4. Research Methodology

This section is divided into six sub-sections, namely econometric model specification, data, definition of variables and a priori expectation, trend analysis of the main variables, pre-estimation diagnostics, panel unit root and co-integration tests and data analysis, interpretation and findings.

Econometric Model Specification: The following empirical models were tested.

$$HCD_{i,t} = \beta_0 + \beta_1 REMIT_{i,t} + \beta_2 LIQUID_{i,t} + X_{i,t} + \mu_i + \varepsilon_{it} \quad (1)$$

$$HCD_{i,t} = \beta_0 + \beta_1 REMIT_{i,t} + \beta_2 LIQUID_{i,t} + \beta_3 (REMIT_{i,t} \cdot LIQUID_{i,t}) + \beta_4 X_{i,t} + \mu_i + \varepsilon_{it} \quad (2)$$

HCD stands for human capital development, REMIT is migrants' remittances whilst LIQUID represents stock market liquidity. X stands for the control variables, namely economic growth, FDI, financial development, inflation, trade openness and infrastructural development. The identification of control variables was guided by a prior study on determinants of human capital development (Shuaibu and Oladayo, 2016). The interaction term $(REMIT_{i,t} \cdot LIQUID_{i,t})$ follows a study done by Goff and Singh (2014). Panel data analysis methods (fixed effects, random effects and pooled OLS) were used to estimate equation 1 and 2 primarily because they can measure the influence that neither cross sectional nor time series analysis can identify, consistent with Hsiao (2003).

Data, Definition of Variables, Justification and a Priori Expectation: The paper used panel data (1995-2014) for emerging markets, namely South Africa, Turkey, Thailand, Russia, Republic of Korea, Portugal, Poland, Philippines, Peru, Malaysia, Mexico, India, Indonesia, Hong Kong, Greece, Czech Republic, Colombia, China, Brazil and Argentina. The data for the variables used were extracted from International Monetary Fund, Global Financial Indicators, African Development Indicators and United Nations Development Programme various reports. Table 1 summarises all the information about the data, data sources and variables used.

Table 1. Variables, proxies, data source(s) and expected signs

Variable	Proxy	Expected relation with human capital development	Source(s) of data
Human capital development (HCD)	Human capital development index	N/A	United Nations Development Programme various reports, International Monetary Fund, Global Financial Indicators and African Development Indicators.
International personal remittances (REMIT)	Personal remittances received (% of GDP)	+/-	International Monetary Fund, Global Financial Indicators and African Development Indicators.
Stock market liquidity (LIQUID)	Stock market turnover (%) and stock market value traded (% of GDP)	+/-	International Monetary Fund, Global Financial Indicators and African Development Indicators.

Economic growth	GDP per capita	+/-	World Development Indicators
Foreign direct investment (FDI)	Net FDI inflow (% of GDP)	+/-	International Monetary Fund, Global Financial Indicators and African Development Indicators.
Financial development (FIN)	Domestic credit to private sector by banks (% of GDP)	+/-	International Monetary Fund, Global Financial Indicators and African Development Indicators.
Inflation (INF)	Inflation, consumer prices (annual %)	-	International Monetary Fund, Global Financial Indicators and African Development Indicators.
Trade openness (OPEN)	Total of exports and imports (% of GDP)	+	International Monetary Fund, Global Financial Indicators and African Development Indicators.
Infrastructural development (INFR)	Electric consumption (% of GDP)	+	International Monetary Fund, Global Financial Indicators and African Development Indicators.

Source: Author's compilation

Trend Analysis: Human capital development, remittances and stock market liquidity trends for emerging markets during the period ranging from 1995 to 2014 are shown in Table 2.

Table 2. Human capital development, remittances and stock market liquidity trends in emerging markets (1995-2014)

	HCD	REMIT	LIQUIDITY (stock market turnover ratio, %)	LIQUIDITY (stock market value traded as a ratio of GDP)
Europe				
Czech Republic	0.86	0.62	49.21	10.68
Portugal	0.85	0.79	60.53	22.91
Russia	0.78	0.27	39.64	23.33
Turkey	0.74	0.84	150.70	38.53
Greece	0.88	1.03	54.88	25.75
Poland	0.83	1.31	41.18	9.19
Latin America				
Argentina	0.82	0.12	21.30	3.51
Brazil	0.75	0.24	54.77	24.39
Colombia	0.74	1.67	10.84	4.57
Mexico	0.78	1.88	28.74	8.20
Peru	0.74	1.53	13.01	3.67

Asia				
China	0.71	0.19	157.30	63.14
Hong Kong	0.89	0.12	54.38	355.29
Thailand	0.74	1.10	72.79	43.33
Indonesia	0.67	0.86	38.07	11.23
India	0.57	3.04	106.35	44.44
Malaysia	0.78	0.46	30.15	42.91
Philippines	0.70	10.19	22.37	12.43
Republic of Korea	0.88	0.68	180.64	102.84
Africa				
South Africa	0.67	0.22	24.86	49.51
Overall mean	0.77	1.36	60.59	45.00

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

Ten out of the twenty countries studied recorded the mean human capital development index above the overall mean human capital development index of 0.77. These countries include Argentina, Mexico, Hong Kong, Malaysia, Republic of Korea, Czech Republic, Portugal, Russia, Greece and Poland. In terms of human capital development index, there are no values that are outliers. Only Mexico, Peru, India and Philippines had their mean remittances ratio above the overall mean of 1.36. The mean remittance ratio of Philippines (10.19% of GDP) which is well above the overall mean is an indication that Philippines is an outlier.

The mean stock market liquidity as measured by stock market turnover (%) of Turkey, China, Thailand, India and Republic of Korea exceeded the overall mean stock market liquidity of 60.59% during the period between 1995 and 2014. Considering the difference between mean stock market liquidity and the overall mean, all these five countries except Thailand are outliers or have abnormal values. In terms of stock market liquidity as measured by stock market value traded (% of GDP), China, Hong Kong, Republic of Korea and South Africa are the four countries whose mean stock market liquidity were above the overall mean level of 45% of GDP. The mean stock market liquidity of Hong Kong (355.29% of GDP) and Republic of Korea (102.84% of GDP) far much exceeded the overall mean stock market liquidity level, thereby providing evidence that the two countries are outliers.

Pre-estimation Diagnostics: The very high standard deviations for economic growth and infrastructural development shows that data for the two variables is characterised by abnormal values. The data for all the variables was also found not to follow a normal distribution pattern as evidenced by the probability values of the Jarque-Bera criteria which is equivalent to zero (see Table 3 under Appendix Section). In contrast to theoretical rationale, correlation analysis shows that there is a significant negative correlation between migrants' remittances and human capital development (see Table 4 in Appendix Section). Stock market liquidity and human capital development were found to have been negatively but non-significantly related, in line with literature. On the other hand, a significant positive correlation between the following variables was detected: (1) Economic growth and human

capital development, (2) FDI and human capital development, (3) financial development and human capital development, (4) trade openness and human capital development and (5) infrastructural and human capital development. As expected, a significant negative relationship was also observed between inflation and human capital development. The maximum correlation between two variables (FDI and trade openness) is 80%, an indication that the problem of multi-collinearity is absent between and among the variables studied. The argument was supported by Stead (1996).

Panel Unit Root and Co-Integration Tests: At first difference, the data for all the variables studied was found to be stationary (see Table 5 under Appendix Section). The paper went on to find out that the variables were co-integrated (see Table 6 under Appendix Section). The results paved way for main data analysis using fixed effects, random effects and pooled OLS estimation techniques.

Data Analysis, Interpretation and Findings

Table 7. Panel data analysis results when stock market turnover (%) used as a proxy for liquidity

	Fixed effects		Random effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
REMIT	0.0052	0.4335	0.0011	0.1029	0.0345***	2.8700
LIQUID	-0.0116**	-2.1538	-0.0078*	-1.6886	-0.0088*	-1.9416
REMIT. LIQUID	-0.0008	-0.2554	-0.0025	-0.8908	-0.0114***	-3.4623
GROWTH	-0.0192*	-1.8526	0.0038	0.4979	0.0562***	8.4016
FDI	0.0003	0.0714	-0.0005	-0.1409	-0.0043	-0.9501
FIN	0.0082	0.7914	-0.0258***	-3.2945	-0.0485***	-7.3481
INFL	-0.0024	-0.7065	-0.0018	-0.5330	-0.0095**	-2.2559
OPEN	0.0196	1.2220	0.0367***	3.4015	0.0411***	5.1407
INFR	0.0228	1.1174	0.0561***	4.7493	0.0406***	4.5339
R-squared	0.8453		R-squared	0.6859	R-squared	0.6307
Adjusted R-squared	0.8336		Adjusted R-squared	0.6741	Adjusted R-squared	0.6222
F-statistic	72.41		F-statistic	59.28	F-statistic	74.01
Prob (F-statistic)	0.0000		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

When stock market turnover (%) was used as a measure of liquidity, fixed and random effects found out that remittances had a non-significant positive impact on human capital development whilst pooled OLS approach shows that remittances positively and significantly influenced human capital development (see Table 7). The positive impact of remittances on human capital development support findings of earlier studies (Ganyo, 2013; Ndiaye et al, 2016; Salas, 2014; Ustubici & Irdam's,

2012) on the similar subject matter. Stock market liquidity had a significant negative impact on human capital development across all the three panel data analysis methods, a finding that resonates with Keynes (1936) who argued that high volatility of the financial sector retards the efficient allocation of financial resources in the economy and impedes economic growth. Stock market liquidity significantly reduces corporate control in preference for transacting shares in the liquid secondary market thereby negatively affecting the allocation of financial resources and economic growth (Levine, 2003). The resultant low or negative economic growth reduce (1) households' income per capita, (2) wealth and (3) investment into human capital development.

The interaction between remittances and stock market liquidity had an insignificant negative effect on human capital development under both fixed and random effects. Under pooled OLS approach, the interaction between remittances and stock market liquidity had a significant negative impact on human capital development. The results show that higher levels of stock market liquidity as proxied by stock market turnover (%) reduce migrant remittances' ability to improve human capital development. The possible reason could be that households engage in stock market speculative activities using the remittances instead of investing in human capital development.

Contrary to majority theoretical predictions, fixed effects show that economic growth had a significant negative influence on human capital development whereas according to the random effects, economic growth had an insignificant positive influence on human capital development. Pooled OLS shows that economic growth had a significant positive impact on human capital development, in line with Bildirici et al (2005) whose study argued that increased per capita income opens up more capacity for training and skills development programmes.

In contradiction to most of the literature, the random effects and pooled OLS show that FDI had a non-significant negative influence on human capital development. On the other hand, FDI had a non-significant positive influence on human capital development under the fixed effects approach. These results are supported by theoretical literature which noted that FDI into the host country flows alongside technical know-how enhancement and training of the labour force (Lucas, 1988). Financial development was found to have had an insignificant positive influence on human capital development under fixed effects whereas both random effects and pooled OLS shows that financial development had a significant negative effect on human capital development.

Both fixed and random effects show that inflation had a non-significant negative influence on human capital development whilst pooled OLS shows that inflation negatively but significantly affected human capital development. The finding resonates with De Gregorio (1992) whose study noted that in the face of high

inflation, educators engage in speculative and short term money making activities instead of devoting more time towards teaching. Whilst trade openness and infrastructure development had a non-significant positive effect on human capital development under fixed effects, pooled OLS and random effects show that trade openness and infrastructure development had a significant positive influence on human capital development. The findings resonate with theoretical literature (Sapkota, 2014; Binder & Georgiadis, 2011).

Table 8. Panel data analysis results when stock market value traded ratio used as a liquidity proxy

	Fixed effects		Random effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
REMIT	0.0047	0.6791	0.0065	0.2609	0.0061	0.8987
LIQUID	0.0008	0.1801	-0.0047	-1.1737	-0.0217***	-5.3198
REMIT.LIQUID	-0.0015	-0.7047	-0.0031	-1.4799	-0.0043*	-1.9092
GROWTH	-0.0202*	-1.9165	-0.0052	-0.6169	0.0570***	8.6295
FDI	-0.0016	-0.4022	-0.0006	-0.1561	-0.0025	-0.5535
FIN	0.0020	0.1911	-0.0179**	-1.9842	-0.0280***	-3.7962
INFL	-0.0012	-0.3518	-0.0012	-0.3522	-0.0093**	-2.2713
OPEN	0.0269*	1.6891	0.0348***	2.8348	0.0428***	5.4388
INFR	0.0287	1.4106	0.0536***	3.8606	0.0383***	4.3854
R-squared	0.8436		R-squared	0.6691	R-squared	0.6447
Adjusted R-squared	0.8318		Adjusted R-squared	0.6502	Adjusted R-squared	0.6365
F-statistic	71.48		F-statistic	56.68	F-statistic	78.64
Prob (F-statistic)	0.0000		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

When stock market value traded ratio was used as a measure of stock market liquidity, remittances had a non-significant positive effect on human capital development across all the three panel data analysis approaches. Stock market liquidity had a (1) non-significant positive impact on human capital development (fixed effects), (2) non-significant negative influence on human capital development (random effects) and (3) significant negative effect on human capital development (pooled OLS). The interaction between remittances and stock market liquidity had a non-significant negative influence on human capital development under both fixed and random effects. On the other hand, pooled OLS shows that the interaction between remittances and stock market liquidity had a significant negative effect on human capital development. The finding indicates that when stock market liquidity is high, recipients of remittances are tempted to invest into speculative stock market activities at the expense of human capital development initiatives.

Robustness tests –The lagged panel data analysis model

$$HCD_{i,t} = \beta_0 + \beta_1 REMIT_{i,t-1} + \beta_2 LIQUID_{i,t-1} + \beta_3 (REMIT_{i,t-1} \cdot STOCKLQ_{i,t-1}) + \beta_4 X_{i,t-1} + \mu + \varepsilon_{it} \quad (3)$$

Matthew and Johnson (2014) argued that explanatory variables of the economic growth data need to be lagged because it takes more time before they have a significant impact not only on the economy but also on human capital development. It is against that backdrop that the current study lagged all the explanatory variables in the human capital development function (see equation 3).

Table 9. Panel data analysis results when stock market turnover (%) used as a proxy for liquidity

	Fixed effects		Random effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
REMIT	0.0002	0.0180	-0.0020	-0.2065	0.0341***	2.9448
LIQUID	-0.0081	-1.6199	-0.0055	-1.2489	-0.0068	-1.5205
REMIT. LIQUID	0.0004	0.1520	-0.0017	-0.6954	-0.0110***	-3.5336
GROWTH	-0.0257***	-2.6031	0.0010	0.1387	0.0555***	8.2778
FDI	0.0004	0.1032	-0.0005	-0.1484	-0.0028	-0.6168
FIN	0.0078	0.7870	-0.0249***	-3.2719	-0.0460***	-7.0067
INFL	-0.0065**	-2.0442	-0.0035	-1.1288	-0.0081**	-1.9909
OPEN	0.0123	0.7661	0.0299***	2.7811	0.0378***	4.6882
INFR	0.0280	1.4511	0.0569***	5.0094	0.0400***	4.5436
R-squared	0.8460		R-squared	0.6417	R-squared	
Adjusted R-squared	0.8344		Adjusted R-squared	0.6383	Adjusted R-squared	
F-statistic	72.77		F-statistic	53.77	Adjusted R-squared	
Prob (F-statistic)	0.0000		Prob (F-statistic)	0.0000	0.6111	
					F-statistic	70.68
					Prob (F-statistic)	
					0.0000	

Source: Author compilation from E-Views (8)

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

When stock market turnover was used as a measure of stock market liquidity, fixed effects shows that remittances had a non-significant positive impact on human capital development and also had a non-significant negative influence on human capital development under random effect (see Table 9). On the other hand, the pooled OLS approach indicates that remittances had a significant positive effect on human capital development. Across all the three panel data analysis methods, stock market liquidity had an insignificant negative influence on human capital development. The interaction between remittances and stock market liquidity had (1) an insignificant positive impact on human capital development (fixed effects), (2) an insignificant negative influence on human capital development (random effects) and (3) a significant negative effect on human capital development (pooled OLS).

Table 10. Panel data analysis results when stock market value traded ratio used as a liquidity proxy

	Fixed effects		Random effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
REMIT	0.0087	1.3782	0.0055	0.9042	0.0079	1.1965
LIQUID	-0.0084**	-2.1655	-0.0117***	-3.1774	-0.0247***	-6.3678
REMIT. LIQUID	-0.0030*	-1.9471	-0.0044**	-2.2546	-0.0050**	-2.2842
GROWTH	-0.0229**	-2.3001	-0.0102	-1.2103	0.0574***	8.7807
FDI	0.0008	0.2105	0.0011	0.2940	-0.0014	-0.3239
FIN	0.0067	0.6636	-0.0097	-1.1002	-0.0236***	-3.2929
INFL	-0.0063*	-1.9333	-0.0046	-1.4403	-0.0090**	-2.3022
OPEN	0.0207	1.3069	0.0265**	2.1166	0.0393***	5.0280
INFR	0.0278	1.4467	0.0535***	3.8890	0.0365***	4.3022
R-squared	0.8468		R-squared	0.5802	R-squared	
Adjusted R-squared	0.8353		Adjusted R-squared	0.5792	Adjusted R-squared	0.6447
F-statistic	73.26		F-statistic	54.23	Adjusted R-squared	
Prob (F-statistic)	0.0000		Prob (F-statistic)	0.0000	0.6365	
					F-statistic	78.64
					Prob (F-statistic)	0.0000

Source: Author compilation from E-Views (8)

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

When stock market value traded was used as a proxy of stock market liquidity, remittances had a non-significant positive influence on human capital development under fixed effects, random effects and pooled OLS (see Table 10). Stock market liquidity had a significant negative impact on human capital development across all the three panel data analysis methods. The interaction between stock market liquidity and remittances had a significant negative influence on human capital development under all the three panel data analysis approaches.

5. Summary of the Study

The objectives of this paper are threefold: Firstly, to investigate the impact of remittances on human capital development. Secondly, to explore the influence of stock market liquidity on human capital development. Thirdly, to study the influence of the interaction between remittances and stock market liquidity on human capital development in emerging markets. To a larger extent, migrants' personal remittances had a positive impact on human capital development whilst stock market liquidity was found to have had a negative influence on human capital development. Though the results are not uniform across the three panel data analysis methods, the interaction between stock market liquidity and remittances had a negative effect on human capital development. The finding means that the presence of high stock market liquidity in emerging markets had a deleterious effect on remittances' ability to enhance human capital development. The study therefore urges emerging markets to implement policies that keeps stock market liquidity at minimal levels in order to enhance migrant personal remittances' impact on human capital development.

Future studies should investigate other channels which facilitate migrant remittances' influence on both human capital development and economic growth.

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7. Appendix Section

Table 3. Descriptive statistics

	HC D	REMI T	LIQUI D	GROWT H	FDI	FIN	INFL	OPE N	INFR
Mean	0.77	1.36	60.6	8 569	3.51	68.02	8.14	80.6	3 046
Median	0.77	0.59	41.3	5 810	2.44	46.7	4.44	56.6	2 466
Maximum	0.94	13.3	407.9	40 170	39.87	233.7	197.5	455.3	10 552
Minimum	0.48	0.02	2.39	381.5	0.03	8.33	0.11	15.6	263.6
Standard deviation	0.09	2.25	58.1	8 020	5.16	51.29	15.32	74.91	2 172
Skewness	- 0.39	3.49	2.13	1.43	4.74	0.8	6.92	2.97	0.75
Kurtosis	2.84	15.6	8.82	4.54	27.97	2.44	68.5	12.7	3.1
Jarque-Bera	10.6	3 477	868	176	11 883	48.4	74 700	2 158	37.5
Probability	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	400	400	400	400	400	400	400	400	400

Source: Author compilation from E-Views

Table 4. Correlation analysis

	HCD	REMIT	LIQUID	GROWT H	FDI	FIN	INFL	OPEN	INFR
HCD	1.00								
REMIT	-0.3***	1.00							
LIQUID	-0.04	-0.2***	1.00						
GROWT H	0.7***	-0.3***	0.09*	1.00					
FDI	0.3***	-0.2***	-0.1	0.51***	1.00				
FIN	0.2***	-0.3***	0.19***	0.52***	0.4***	1.00			
INFL	-0.11**	-0.03	0.05	-0.20***	-0.1***	-0.3***	1.00		
OPEN	0.4***	-0.1	-0.05	0.56***	0.8***	0.6***	-0.1***	1.00	
INFR	0.6***	-0.4***	0.16***	0.73***	0.2***	0.5***	-0.1*	0.4**	1.00

Source: Author compilation from E-Views

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

Table 5. Panel root tests

Level	Variable	LLC	IPS	ADF	PP
Individual intercept	LHCD	-10.09*** (0.00)	-7.04***(0.00)	121.7***(0.00)	171.6***(0.00)
Individual intercept	LREMIT	-11.22***(0.00)	-5.31***(0.00)	166***(0.00)	65***(0.01)
Individual intercept	LLIQUID	-7.6***(0.00)	-6.5***(0.00)	128***(0.00)	127***(0.00)
Individual intercept	LGROWTH	1.01 (0.84)	4.56(1.00)	10.17(1.00)	16.65(0.99)
Individual intercept	LFDI	-5.72***(0.00)	-5.37***(0.00)	98.3***(0.00)	144.5***(0.00)
Individual intercept	LFIN	-2.84***(0.00)	0.40(0.66)	35.8(0.66)	28.5(0.91)
Individual intercept	LINFL	-4.70***(0.00)	-3.88***(0.00)	78.4***(0.00)	106.7***(0.00)
Individual intercept	LOPEN	-2.56***(0.01)	0.27(0.61)	35.5(0.67)	38.01(0.56)
Individual intercept	LINFR	-2.56***(0.01)	1.95(0.97)	33.1(0.77)	74.4***(0.00)

First difference

	Variable	LLC	IPS	ADF	PP
Individual intercept	LHCD	-17.35***(0.00)	-15.36***(0.00)	263.54***(0.00)	2 481***(0.00)
Individual intercept	LREMIT	-8.56***(0.00)	-7.52***(0.00)	133.8***(0.00)	195***(0.00)
Individual intercept	LLIQUID	-13.2***(0.00)	-14.3***(0.00)	245***(0.00)	400***(0.00)
Individual intercept	LGROWTH	-6.68***(0.00)	-5.12***(0.00)	93.2***(0.00)	138.8***(0.00)
Individual intercept	LFDI	-11.1***(0.00)	-12.9***(0.00)	222.6***(0.00)	1 483***(0.00)
Individual intercept	LFIN	-5.87***(0.00)	-5.48***(0.00)	101.5***(0.00)	154.6***(0.00)
Individual intercept	LINFL	-13.66***(0.00)	-13.27***(0.00)	227.7***(0.00)	764.7***(0.00)
Individual intercept	LOPEN	-8.32***(0.00)	-8.48***(0.00)	147.2***(0.00)	285.1***(0.00)
Individual intercept	LINFR	-8.15***(0.00)	-7.95***(0.00)	142***(0.00)	256.9***(0.00)

Source: Author's compilation from E-Views

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 1%, 5% and 10% levels of significance, respectively.

Table 6. Kao Residual Co-integration Test - Individual intercept

	T-statistic	Probability
Augmented Dickey-Fuller (ADF)	-4.9716	0.0000

Source: Author's compilation from E-Views