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Do Workers' Remittances Boost Human Capital Development?

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This study examines the influence of workers' remittances along with the economic governance system on human capital development in 17 countries having low income, lower middle, upper middle and high income levels by using the annual panel between 1996 and 2013. Overall, results of fixed-effects model reveal that workers' remittances have significantly positive impact on the human capital development. Results also reveal the positive and significant impact of all selected variables of economic governance system on human capital. It is concluded that the strong economic governance system strengthens the association between workers' remittances and human capital during the aforementioned time period.

JEL Classification: F24, J23
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1. INTRODUCTION

A number of factors contribute to the national economic development systems as well as humans living standards. One of the leading factors in this regard is the workers' remittances to the developing countries; where the workers' living abroad transfer money to their home countries. Every state aims to improve society's welfare using different approaches and sources. The role of migrant remittances, in this regard, is highly vital because they contribute evidently in the economic growth and development process. Consequently, remittances play an effective and positive role in poverty alleviation and in improving the human capital of the developing world. However, some studies support the positive impact of emigrant remittances, as well as there are some studies disagree with aforementioned role of the workers' remittances. Those who disagrees point out the remittances are used for unproductive purposes. For example, Chami, *et al.* (2003) observe that the receipt of migrant remittances can produce behavioural changes as remittances inflows tend to be consumed on consumption good rather than investment goods. Similarly, the studies of Rodriguez and Tiognson (2001) and Amuedo-Dorantes and Pozo (2004) explored that migrant remittance may have negative effect on domestic competitiveness depressing the expected returns on capital and thereby resulting in lower the rate of capital accumulation. Similar results are shown in a study by Okolski (2006) reflecting that the money transferred by migrant to Central and Eastern Europe countries is mostly utilised to enlarge migrant household consumption. The impacts of international

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remittances with regard to investment are scarcely apparent on the level of regional economy. However, a trend of the enlarged expenditures of remittances on the education of immigrants' children is being detected in the case of Poland.

A study by Asiedu (2003) discloses that almost 30 percent of international remittances are spending for the investment and formation of house purposes in Ghana. Cox-Edwards and Ureta (2003) find that children from remittance receiver households are less expected to drop out of school, which they attach to the easing of budget limitations affecting poor receiver households in El Salvador. Hanson and Woodruff (2003) observe that migrant remittances are linked with higher educational attainment in rural Mexico, specifically among 10-15 year old girls whose mothers have little educational levels. Adams and Page (2005) expound that migrant remittances have a robust statistically significant negative effect on poverty in 71 developing countries. The results show that a 10 percent upsurge in the share of international remittances in a country's Gross Domestic Product (GDP) would reduce 1.6 percent of people living in poverty. The World Bank (2006) report reveals that it is empirical confirmed that migrant remittances usually diminish poverty and can reallocate income. The study of Ziesemer (2006) suggests that the key indication is that workers' remittances boost savings, whereas, savings perform two things. They lower interest rates, those stimulate investment, and savings augment either school enrolment or keep the school enrolment intact by guaranteeing finance and thereby promoting literacy. Consequently, both investment and literacy help in boosting up the GDP per capita growth rate.

A study by Rapoport and Docquier (2006) explicate that migrant migrants' remittance are usually spend to pay back loans, acquired to finance migration or education, and insurance. Therefore, those directly contribute to household income which enables households to buy more assets; supports greater investment in business; and enable procurement more goods, consist of education and health inputs. Acosta (2007) exposes that the nature, magnitude, and evolution of international remittances flows, it would not be a disbelief that international remittances are now realised by development experts as having a possibly vital role to play in sustaining the development struggles of the host countries. The study further explains that there are two major ways through international remittances those can maintain these efforts. Firstly, international remittances, received by the poorest class of the population directly contribute to poverty decline. It implies that remittances have significantly positive effect on welfare effects of the recipient countries. Secondly, international remittances may contribute towards better investment in human and physical capital. Meanwhile, international remittances can possibly add in growing the country's long-run growth potential through greater rates of capital formation. Pant (2008) explores that whether international remittances are consumed for consumption, for acquiring houses or for any other investments; those reflect positive effect on the entire economy by encouraging demand for other goods and services. As the migrants provide capital that certainly have progressive effect on their countries of origin.

In the same way, the studies of Yang (2008) and Annen, *et al.* (2014) indicate that migrants' remittances are transitory type of income, and the households wish to consume them more on investment goods including; human and physical capital investments than on merely consumption goods, and thereby it positively contribute to economic growth and

development. It implies that an upsurge in remittances inflows capitulate a positive income effect to education spending which increases the marginal benefit of human capital gaining activities. Received income from remittances have a positive effects on schooling which consequently leads to improvement in human capital and in that way fostering long-term output of the recipient countries. The study of Yang (2008) maintains that accrued migrant earnings can let investments that would not have else been made because of credit limitations and large up-front costs. Generally, remittances receipts to be constructively associated with several types of household investments in the developing world. The positive income shocks lead to boost human capital accumulation and entrepreneurship in the migrant's origin households. The positive migrant shocks also lead to larger child schooling, decrease child labour, and enlarge educational spending in the Philippine. Rao and Hassan (2010) expounds that the most important indirect growth influence of workers' remittances those have gained insufficient attention is the impact on human capital development through education. International remittances are now the most important private financial resources for households in home countries immigrants, whereas remittances cannot be studied as an alternative for foreign direct investment, foreign aid, and external debt. International remittances are relatively secure and foreseeable as compared to other the financial inflows [United Nations (2010)]. Migrant remittances have positive effect on human development outcomes across several areas including; education, health and gender equality [Ratha (2013)]. The study of Azam and Ahmed (2015) also shed light on the indispensable role play by the human capital in the process of economic growth and development.

Migrant remittances are substantial sources of several low income countries; therefore, eliminating barriers to migrant remittance flows may assist in maintaining strong inflows.[1] Evidently, international remittances have been drastically growing in developing countries. According to the World Bank statistics, remittances flows to developing countries, are estimated almost USD435 billion in 2014. The remittance growth rate this year is considerably faster than the 3.4 percent growth documented in 2013, driven mostly by migrant remittances to Asia and Latin America. It is expected that remittances flows to developing world will continue rising in the medium term, touching an estimated USD454 billion in 2015. Remittance inflows offered constant cover for considerable parts of the import bill for countries like; Egypt, Pakistan, Haiti, Honduras, and Nepal. The remittances inflows to India and China are estimated USD71 billion and USD 64 billion respectively in 2014. The inflows of remittance are likely to grow strongly to almost all regions, with the exception of Europe and Central Asia, of the developing world due the conflict in Ukraine and related sanctions are contributing to an economic downtrend in Russia. While, the East Asia and Pacific and South Asia regions are expected to enhance the greatest remittance flows. Evidently, India received almost USD$71 billion in remittances in 2014, with the world's leading emigrant stock of 14 million people. The other outsized recipients are China (USD64 billion), the Philippines (USD28 billion), Mexico (USD24 billion), Nigeria (USD21 billion), Egypt (USD18 billion), Pakistan (USD17 billion), Bangladesh (USD15 billion), Vietnam (USD11 billion) and Ukraine (USD9 billion).[2] The Human Capital Index (HCI)–2015 reveals that

[1]World Bank (2015).
[2]Ratha (2014).

the Asia and the Pacific is visibly the world's most densely inhabited region, scores towards the middle of the range of the HCI overall average score is projected 67.83. Where almost half of the countries in the entire region have attained near-universal primary school enrolment rates on average nearly 20 percent of the region's under 15 age group is yet not registered in secondary education. The HCI in the Europe and Central Asia, overall average score is estimated 77.06. Most countries in the region are very near to having accomplished universal primary school enrolment. The HCI in the Latin America and the Caribbean region score in the middle range of the Index, jointly with the Asia and the Pacific region, with an overall average score of 66.46. Though, many countries in the region have not yet attained universal primary school enrolment. While several countries perform well in primary school enrolment in the Middle East and North Africa (MENA) region. Similarly, the Sub-Saharan Africa region, with an overall average score of 54.46, ranks lowest compared to other regions, indicating the same display across all age groups excluding for the 65 and over age group, in which it performs slightly better than the MENA region [World Economic Forum (2015)].

Some erstwhile studies claim that the examination of benefits accumulating to migrants' source countries is a crucial and practically uninvestigated area in research on migration.[3] Therefore, the broader aim of this study is to explore the effect of immigrants' remittances along with economic governance system of the beneficiary countries' education human capital, measured by gross secondary school enrolment (%) for a set of 17 countries from low, lower middle, upper middle and high income countries. We assume that characteristics of these countries are almost similar. The outcomes of the study are expected to guide the policy-makers to enhance more international remittances flows strengthen good governance which will help further in the process of human capital formation and consequently economic growth and development. This is the first inclusive empirical study on the subject mentioned above. One of the main contributions of this study is to prolong the literature on the positive role played by migrant remittances, by discovering the role of international remittances inflows in the enhancement of human capital formation in the countries of origin of migrants.

The rest of the study is structured as follows. Section 2 deals with a brief review of the relevant literature on the subject. Section 3 presents the empirical methodology and data description. Section 4 discusses empirical results followed by the Section 5 that concludes the study.

2. PREVIOUS EMPIRICAL STUDIES

Numerous studies have been carried out on the impact of migrant remittances on the economic growth with a little attention paid towards empirical impact on the human capital formation. Previous studies investigate inconclusive results that whether or not the migrant remittances contribute positively in the process of human capital formation, for example, Funkhouser (1992) suggests that international remittances not only bear a positive impact on physical investment, but those can also develop human capital formation, for instance investment in education and health. The main findings revealed in a study by Looney (1992) explores that countries in the Arab world have practiced growths in human capital development accompanying with improved rates of military participation. Heylen, *et al.*

[3]Borjas (1999).

(2003) find that government spending on education has significant positive impact on human capital for 93 countries during 1975-1995, while the empirical results on inflation variable indicates that growing inflation mostly accelerates human capital. Ziesemer (2006) finds that overall migrant remittances have positive impacts on the school enrolment, literacy and thereby increase the GDP per capita growth rate for 99 countries over the period ranging from 1960-2003. Ponce, *et al.* (2008) observe that remittances have a positive effect on consumption, and on education and health spending in Ecuador; however the study failed to find any significant impacts on education and health outcomes. The study also observes that children getting international remittances have a higher prospect of attending private schools, whereas, people getting international remittances purchase more medicines and are expected have better medical treatment in case of sickness.

The study by Bansak and Chezum (2009), reveals that young girls benefit much less from international remittances, but suffer less harm from household trouble, when investigating the effect on human capital in Nepal, whereas it helped women maximally. Civilize and Frenk (2009) find that the impact of migrant remittances on infant mortality depend on how households consume remittance income received. However, the study verified that infant mortality will be less predominant in migrant remittance receiving households during a survey conducted between 1992 and 1999. Adenutsi (2010) finds that international remittance inflows have a significant positive long-run effect on largely human development in 18 low-income Sub-Saharan African countries during 1987-2007. Udah (2011) detect that foreign remittances affect economic performance in Nigeria through its collaboration with human capital and technology transmission over the period of 1970-2008. In a similar way, the study uphold by De and Ratha (2012) examines the developmental impacts of migrant remittance income on the recipient households during a survey conducted across all nine provinces of Sri Lanka between October 1999 and the third quarter of 2000. The results reveal that international remittance income has significantly positive impact on children health and education, but not on visible consumption or asset enlargement.

A study by Matano and Ramos (2013) explores the impact of foreign remittances on education outcomes in Moldova using household data for the year 2008. The probit and IV probit estimates indicate that family receiving remittances enlarges the possibility of getting higher education of about 33 percent. In addition, the migrant education level has a significantly positive effect on family members' education. The study of Joseph and Wodon (2014) finds that international remittances have a significantly positive impact on human development outcomes (school enrolment) in Yemen, during a survey includes 13136 households during 2005-2006. The empirical findings of Salas (2014) study suggest that migrant remittances have a significantly positive impact on the likelihood to send children to private schools in Peru over the period from 2007-2010. Azam (2015) discovers the existence of a significant positive association between international remittances and economic growth in four developing Asian countries namely Bangladesh, India, Pakistan and Sri Lanka during 1976-2012. Similarly, a study by Bouoiyour and Miftah (2015) explores the effect of migrant remittances on household spending and relative poverty in Morocco, while, using propensity score matching techniques to the 2006-2007 Moroccan living standards measurement survey. The study observes that international remittances can foster living standards among Moroccan households and affect destructively the incidence of poverty in the country.

On the other hand, the study of Booth (1995) reveals that labour immigration and receipts of remittances may have contrasting effects in children's education enhancement. The study of Boucher, *et al.* (2005) reveals that the effect of migration from rural Mexico to the United States does not exhibit positive on schooling, nor does it considerably affect human capital formation. McKenzie and Rapoport (2006) suggest that migration is inversely associated with school attendance rates and whole education level. The reason of the inverse effect of migration on education is because of the higher demand for child labour overweighs the encouraging effect of migration due to money remittances and better income levels. Nasir, *et al.* (2011) explore the impact of workers' remittances on the educational performance of children in the household's recipient these foreign remittances, using primary data at the household level is gathered from four cities of the Khyber Pakhtunkhwa, Pakistan. The ordinary least squares estimates uncovers that foreign remittances have significant negative effects on educational performance. Though, the effect becomes statistically insignificant once parental education is incorporated as a regressor in the regression process. The study of Kroeger and Anderson (2014) obtains mixed results on the impact of the receipt of remittances on the education and health of children in Kyrgyzstan during 2005-2009. The empirical findings reveal that girls in remittances' receipt households are more expected to be malnourished. However, foreign remittances fail to improve the human capital of kids left behind, while, the study observe an overall positive expansion in school enrolment among young kids between 2005 and 2009 although an adverse trend in enrolment among older boys and girls has been observed. Table 1 portrays some selected erstwhile empirical studies on the effect of migrant remittances on human capital.

Table 1

Compact Prior Empirical Studies on the Effect of Remittances on Human Capital

Author (s)	Periods, Country, and Estimator	Dependent Variable	Independent Variables	Findings
Adenutsi (2010)	1987-2007, fixed-effects 18 Sub-Saharan African countries	Human development	Remittances, government spending, trade openness, and inflation,	Remittances have significant positive long-run impact
Chaaban and Mansour (2012)	Jordan, Syria and Lebanon[4] Probit model	Education attendance	Remittances household characteristics, individual's characteristics, parent education and dwelling size	Remittances has larger effects for Jordan and Syria, while, lower for Lebanon
Hassan, *et al*. (2013)	1981-2011 Pakistan ARDL approach	Secondary school enrolment	Remittances, population growth rate, FDI, GDP per capita	Remittances have significant negative impact
Gittens and Pilgrim (2013)	1970-2010 Developing Countries GMM, OLS	School	FDI, GDP per capita growth, public sector spending, and life expectancy	FDI has a positive impact on human capital variables
Ngoma and Ismail (2013)	1970- 2010 Malaysia GMM	Schooling at secondary and tertiary levels	Remittances, population size, education expenditure and GDP	Remittances have significant positive long-run impact
Hines (2014)	2009 Kenya OLS and 2SLS	Household expenditures on education	Remittances, primary and secondary education	Remittances have significant positive impact
Acharya and Gonzalez (2014)	1995–1996 (Ist round) 2003–2004	School choice or the school progression of child	Migration, remittances, and non-remittance income, parents, household,	Remittances have significant positive long-run impact

[4]Lebanon (sample=13003 households), Syria (sample=29790 households. Jordan (sample=12768 households).

ARDL=Autoregressive Distributed Lag Bounds Testing GMM=Generalised methods of moment OLS= Ordinary least squares.

	(2nd round) Multinomial logit Nepal		and community	
Batu (2015)	1970-2010 OLS	Primary and Secondary school enrolment	Remittances, population, ethnic fractionalisation, real GDP	Remittances have significant positive impact

Source: Authors compilation.

3. EMPIRICAL METHODOLOGY

The study employs 18 years annual panel data from the period of 1996 to 2013[5] of 17 countries. All data are acquired from the official databases of World Bank. There are four high income countries, six upper middle income countries, six lower middle income countries and one low income country in the selected sample according to the database of World Bank of different income level countries. There are three main income level groups in the sample used. Low income and the lower middle income countries are combined to form a one group and named them as low income countries. The other two groups are for middle income and high income countries. The details of countries with their income level group are presented in Table 2. After reviewing the empirical studies, the model to analyse the relationship between workers' remittances, economic governance system and human capital development is determined by following functions:

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \varepsilon_{i,t} \quad \ldots \quad \ldots \quad (1)$$

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \beta_7 C_{i,t} + \varepsilon_{i,t} \quad \ldots \quad (2)$$

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \beta_7 G_{i,t} + \varepsilon_{i,t} \quad \ldots \quad (3)$$

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \beta_7 P_{i,t} + \varepsilon_{i,t} \quad \ldots \quad (4)$$

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \beta_7 Q_{i,t} + \varepsilon_{i,t} \quad \ldots \quad (5)$$

$$H_{i,t} = \alpha_0 + \beta_1 Y_{i,t} + \beta_2 E_{i,t} + \beta_3 F_{i,t} + \beta_4 N_{i,t} + \beta_5 M_{i,t} + \beta_6 R_{i,t} + \beta_7 V_{i,t} + \varepsilon_{i,t} \quad \ldots \quad (6)$$

Table 2

List of 17 Countries Included

Country	Income Level
Armenia	Lower middle income
China	Upper middle income
India	Lower middle income
Indonesia	Lower middle income
Israel	High income
Japan	High income
Jordan	Upper middle income
Kazakhstan	Upper middle income
Korea, Rep.	High income
Kyrgyz Republic	Lower middle income
Malaysia	Upper middle income
Mongolia	Lower middle income
Nepal	Low income

[5]Though, we wish to use longer period data, while for some of our incorporated variables, the data were only available between 1996 and 2013.

Oman	High income
Pakistan	Lower middle income
Thailand	Upper middle income
Turkey	Upper middle income

Source: Authors' construction.

In the above model *i* represent the number of countries in the panel and *t* represents the number of observations over time. *H* is the human capital development which is measured by the proxy of gross secondary school enrolment,[6] *Y* is the economic growth, which is measured by gross domestic product per capita, *E* is export as a percentage of GDP, *F* is the inward foreign direct investment as percentage of GDP, *N* is the per capita energy use by any individual in a country, *M* is a military expenditure as percentage of GDP, *R* is a workers' remittances as percentage of GDP. In this research we also use different variables of economic governance system to analyse the impact of governance system on the development of human capital. In the above mentioned Equations 2-6, *C* represents the control on corruption in the economic system, *G* represents government effectiveness, *P* represents political stability, *Q* represents the regulatory quality and *V* represents the voice and accountability. The detailed descriptions of all variables are presented in Table 3.

Table 3

List of Variables

Label	Full Form
S	School enrolment, secondary (% gross)
Y	GDP per capita are in constant 2005 U.S. dollars.
E	Exports of Goods and Services as percentage of GDP
F	Foreign Direct Investment as percentage of GDP
N	Energy use (kg of oil equivalent per capita)
M	Military expenditure as percentage of GDP
R	Personal remittances, received as percentage GDP
C	Control of Corruption (ranges from –2.5 (weak) to 2.5 (strong) governance performance).
G	Government Effectiveness (ranges from –2.5 (weak) to 2.5 (strong) governance performance).
P	Political Stability and Absence of Violence/Terrorism (ranges from –2.5 (weak) to 2.5 (strong) governance performance).
Q	Regulatory Quality (ranges from –2.5 (weak) to 2.5 (strong) governance performance).
V	Voice and Accountability (ranges from –2.5 (weak) to 2.5 (strong) governance performance).

Source: World Development Indicator, the World Bank http://data.worldbank.org/indicator

In this study we employ two panel unit root tests namely Im, *et al.* and Levin, *et al.* to analyse the stationary properties of variables. The present study also employs the Pedroni (1999) panel co-integration technique to analyse the long run relationship among variables. In this study, fixed-effects method is used to analyse the long run coefficients. Moreover, different interaction terms[7] of workers' remittances and economic governance system to more validate their impact on the human capital development, are used in the

[6]Most of the erstwhile studies uses secondary school enrollment [Barro and Lee (2001); Tiruneh and Radvansky (2011); Farkas (2012); Azam and Ahmed (2015)], therefore, we also prefers secondary school enrollment over the others proxies.

[7]The interaction term is used where the governance indicators (i.e., control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, and voice and accountability) has been multiplied with remittances in order to understand the effect of each governance indicator with remittances on human capital in the study.

study. Granger causality test also used to analyse the causal relationship between considered variables.

4. RESULTS AND ESTIMATIONS

To check the stationary properties of variables, the study use Im, Pesaran and Shin and Levin, Lin and Chu panel unit root tests. Table 4 represents the results of stationary tests. These tests are applied first on the level of variables, then on their first difference.

It is evident from Table 4 that all variables are stationary and integrated at first difference. This implies that the series of variables may exhibit no unit root problem and that these series of variables can be used to analyse the long run relationship.

Table 4

Results of Stationary Analyses

	Im, Pesaran and Shin				Levin, Lin and Chu			
	I(0)		I(1)		I(0)		I(1)	
Variables	C	C&T	C	C&T	C	C&T	C	C&T
S	–0.656	–1.218	–6.548*	–5.195*	–0.819	–0.111	–6.580*	–5.344*
Y	4.884	2.172	–9.596*	–7.974*	–0.262	1.263	–16.540*	–15.612*
E	0.794	–0.750	–6.364*	–5.103*	0.552	–1.013	–7.515*	–6.663*
F	3.104	0.219	–9.225*	–6.083*	1.456	–1.028	–9.882*	–6.976*
N	5.362	0.487	–6.656*	–5.103*	0.725	–1.163	–7.330*	–6.663*
M	–1.250	–0.326	–5.853*	–4.130*	–0.676	–0.987	–7.046*	–6.259*
R	–0.081	0.386	–7.407*	–5.351*	–1.057	–0.042	–8.738*	–7.792*
C	–0.269	–1.262	–9.830*	–7.111*	–1.153	–1.190	–9.318*	–6.608*
G	0.566	–0.475	–10.228*	–5.195*	–1.075	–0.351	–12.013*	–5.344*
P	–0.462	–0.065	–8.049*	–6.861*	–1.092	–0.680	–9.198*	–8.829*
Q	–1.167	1.045	–7.358*	–4.993*	–0.830	0.300	–6.445*	–3.988*
V	–0.473	–0.756	–9.766*	–8.308*	–0.179	–0.049	–10.786*	–11.268*

Source: Authors' estimation.

*, **, *** Indicates significance level respectively at 1 percent, 5 percent and 10 percent.

Since the stationary results from unit root tests confirm that each series of variable are integrated of order one. The panel cointegration technique developed by Pedroni (1999) has been used to analyse the long run relationship between our considered variables. The Pedroni's panel cointegration approach has several advantages upon other cointegration methods of panel data. This approach controls the biasness from country size and also solves the issue of heterogeneity.[8] A panel cointegration technique is examined by analysing the variables and residuals of a model. The variables should be cointegrated on $I(1)$ while the residuals should be $I(0)$ if the variables are cointegrated. The residuals of the hypothesised cointegration equation can be established from the following equation:

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots \quad (8)$$

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \beta_i^7 C_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots (9)$$

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \beta_i^7 G_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots (10)$$

[8]See, Das and Choudhary (2011).

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \beta_i^7 P_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots (11)$$

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \beta_i^7 Q_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots (12)$$

Table 5

Results of Pedroni (Engle-Granger based) Panel Cointegration

Estimates	Stats.	Prob.
S = *f* (Y+E+F+N+M+R)		
Panel v-statistic	–1.098	0.864
Panel rho-statistic	3.260	0.999
Panel PP statistic	–4.170	0.000
Panel ADF statistic	–4.466	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	5.032	1.000
Group PP statistic	–4.698	0.000
Group ADF statistic	–4.074	0.000
S = *f* (Y+E+F+N+M+R+C)		
Panel v-statistic	–1.799	0.964
Panel rho-statistic	3.457	1.000
Panel PP statistic	–2.795	0.003
Panel ADF statistic	–2.456	0.007
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	5.424	1.000
Group PP statistic	–3.220	0.001
Group ADF statistic	–1.898	0.029
S = *f* (Y+E+F+N+M+R+G)		
Panel v-statistic	–1.569	0.942
Panel rho-statistic	2.971	0.999
Panel PP statistic	–4.705	0.000
Panel ADF statistic	0.208	0.582
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	4.963	1.000
Group PP statistic	–8.873	0.000
Group ADF statistic	–0.022	0.491
S = *f* (Y+E+F+N+M+R+P)		
Panel v-statistic	–1.162	0.877
Panel rho-statistic	3.439	1.000
Panel PP statistic	–4.866	0.000
Panel ADF statistic	–5.084	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	5.129	1.000
Group PP statistic	–6.270	0.000
Group ADF statistic	–4.723	0.000
S = *f* (Y+E+F+N+M+R+Q)		
Panel v-statistic	–1.199	0.885
Panel rho-statistic	3.352	1.000
Panel PP statistic	–4.954	0.000
Panel ADF statistic	–4.949	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	5.096	1.000
Group PP statistic	–5.983	0.000
Group ADF statistic	–4.814	0.000
S = *f* (Y+E+F+N+M+R+V)		
Panel v-statistic	–1.363	0.914
Panel rho-statistic	3.290	1.000
Panel PP statistic	–3.656	0.000
Panel ADF statistic	–4.103	0.000
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	5.171	1.000

Group PP statistic	–6.546	0.000
Group ADF statistic	–4.824	0.000

Source: Authors' estimation.

The null hypothesis of Pedroni's (1997) panel cointegration procedure is no cointegration.

$$H_{i,t} = \alpha_i + \beta_i^1 Y_{i,t} + \beta_i^2 E_{i,t} + \beta_i^3 F_{i,t} + \beta_i^4 N_{i,t} + \beta_i^5 M_{i,t} + \beta_i^6 R_{i,t} + \beta_i^7 V_{i,t} + \emptyset_{it} + \varepsilon_{it} \quad \ldots(13)$$

Where i=1,…., N; t=1,….,T, and N is the number of countries in the panel and T is the number of observations over time. The estimated residuals become:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + \nu_{it} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (14)$$

With the null hypothesis of no cointegration, the residual is $I(1)$ and ρ_i=1. There are two alternative hypotheses. First, the homogenous alternative (within dimension test), (ρ_i=ρ) < 1 for all i, and second, heterogeneous alternative (between dimension or group statistics) ρ_i< 1 for all i.

Results indicate that in the all six models the test statistics of ADF and PP based on both within dimension and group based approach statistics demonstrate the rejection of null hypothesis of no cointegration in the favour of alternative that all considered variables are cointegrated in the sample countries. Guterrez (2003) argues that group statistics has the best power to judge the cointegration among the test statistics of Pedroni (1999). It is concluded that our selected variables exhibit a valid long run relationship.

This study uses Kao (1999) residual based panel cointegration test to analyse the long run relationship between workers' remittances, economic governance system and human capital development in the sample countries. The null hypothesis of Kao residual panel cointegration test is that there is no cointegration among the series of variables. The desirable probability to have a valid long run relationship is must be less than 0.10 which represents that there exist a valid long run relationship at significance level of 10 percent. Results of Kao residual based panel cointegation test are presented in Table 6. Results suggest that in all six models the null hypothesis of no cointegration is rejected in the favour of alternative that all considered variables are cointegrated.

Table 6

Results of Kao Residual (Engle-Granger based) Panel Cointegration

Estimates	Stats.	Prob.
S = *f* (Y+E+F+N+M+R)		
Panel ADF statistic	–2.216	0.013
Residual variance	0.016	
HAC variance	0.012	
S = *f* (Y+E+F+N+M+R+C)		
Panel ADF statistic	–1.670	0.047
Residual variance	0.016	
HAC variance	0.009	
S = *f* (Y+E+F+N+M+R+G)		
Panel ADF statistic	–1.790	0.037
Residual variance	0.016	
HAC variance	0.011	
S = *f* (Y+E+F+N+M+R+P)		
Panel ADF statistic	–2.232	0.013
Residual variance	0.016	
HAC variance	0.013	
S = *f* (Y+E+F+N+M+R+Q)		
Panel ADF statistic	–1.854	0.032
Residual variance	0.016	
HAC variance	0.011	
S = *f* (Y+E+F+N+M+R+V)		

Panel ADF statistic	–1.841	0.033
Residual variance	0.016	
HAC variance	0.013	

Source: Authors' estimation.

The null hypothesis of Kao Residual Cointegration panel cointegration procedure is no cointegration.

Results of long run estimations based on fixed effect models are presented in Table 7. Wald test[9] is used to analyse the cross section effects and period effects in the model. Results of the Wald test indicate that in all five, both hypotheses are rejected and there is a significantly difference in considered variable between countries and over time. Hausman's test is used to identify the most preferable method between fixed-effects model (*FEM*) and random-effects model (*REM*).[10] The results of Hausman test indicate that alternative hypothesis is accepted in all six models and fixed effect model is preferred over random effect model.

From the above discussion it is clear that fixed effect model is preferred in this study. Results presented in Table 7 of fixed effect model of complete sample indicate that the workers' remittance has a significant positive impact on the human capital development in the sample countries. These results suggest that the migrants' remittances play a significant role to enhance the capabilities and achievements of human capital. The migrants' remittances provide a source of income for the families of these migrants. The migrants generally get better salaries in host nation as compare to their home nation that will increase the earning opportunities and hence also increase the living standard of migrant family members in home country. The better schooling for the children and healthy environment is also an achievement from the migrants' remittances. The families in the home country also save the substantial amount of their remittances for the future events to secure their futures. The families also use their remittances for investment activities specially to buy a new house to get better living standards. These all contribution of worker' remittances play a significant role to enhance the human capital development in a country.

Results also indicate the positive and significant impact of all variables of economic governance system i.e., control on corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality and voice and accountability on human capital development. These findings suggest that the strong economic governance system play a significant role to enhance the capabilities and skills of human capital in an economy. The control on corruption will provide the sense of equality among the citizens. It will also reduce the gaps between the elites and general public in the economy which consequently decrease the stress level and enhance the sense of humanity and productivity of the general public. The government effectiveness is necessary for the development of human capital. The quality of public services, the quality of civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of government's commitment to such policies play a significant role to develop human capital. The absence of violence/terrorism elements from the society also contributes to provide the stress-free, hassle-free and relax environment to the citizens. The ability of government to formulate and implement sound policies and regulations and promote private sector

[9] See, Greene (2000), pp. 390–391.

[10] See, Greene (2000), pp. 576–577.

development also encourage the employment opportunities in the economy. Consequently, the wages level also increase which leads to develop the living standard of the citizens. The extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media also create the sense of voice and accountability among the citizens. These all discussion confirm that the workers' remittances and strong economic governance system leads to develop the human capital.

Table 7

After having the positive and significant impact of workers' remittances and strong economic governance system on the development of human capital in the complete sample, now we analyse the same relationship with different income level. Results of low, middle and high income countries are presented in Table 8, Table 9 and Table 10 respectively. Results show the positive and significant impact of workers' remittances on human capital development in all three income level countries. The highest contribution of workers' remittances on human capital development is found in low income countries. Therefore, it can be concluded that the low income countries are more rely on workers' remittances to develop their human capital. Results also show the positive and significant impact of all variables of economic governance system i.e. control on corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality and voice and accountability on human capital development in all three income levels. The highest contribution of control on corruption and voice and accountability on human capital development is found in low income. Conversely, the highest contribution of government effectiveness and political stability on human capital development is found in high income. Finally, the highest contribution of regulatory quality on the development of human capital is found in middle income countries.

4.1. Results of Interaction Terms

Table 11 represents the results of interaction terms of workers' remittances and economic governance system in full sample countries. The objective of these estimations is to analyse the influence of strong economic governance system on the relationship of workers' remittances and human capital development. Results show that the interaction terms of five governance variable with workers' remittances have positive and significant impact on human capital development. The coefficients of all five interaction terms have more value than the basic model of workers' remittances. Hence, it can be concluded that the strong economic governance system strengthen the relationship between workers' remittances and human capital development.

After having the positive and significant impact of interaction terms of workers' remittances and strong economic governance system on the development of human capital in the complete sample countries, now we analyse the same relationship with different income level. Results of low, middle and high income countries are presented in Table 12, Table 13 and Table 14 respectively. Results show the positive and significant impact of interaction terms of economic governance system with workers' remittances on human capital development in all three income level countries. The highest contribution of all interaction terms on human capital development is found in low income countries. Therefore, it can be concluded that the highest contribution of strong economic governance system strengthen the relationship between workers' remittances and human capital development in low income countries.

Table 8

Table 9

Table 10

Table 11

Table 12

Table 13

Table 14

Table 15

Results of Panel Granger Causality Test

Variables	F-Stats	Prob.
S does not Granger Cause R	0.051	0.822
R does not Granger Cause S	8.854	0.003
S does not Granger Cause C	0.091	0.764
C does not Granger Cause S	5.031	0.026
S does not Granger Cause G	0.021	0.884
G does not Granger Cause S	9.820	0.002
S does not Granger Cause P	0.014	0.905
P does not Granger Cause S	8.053	0.005
S does not Granger Cause Q	1.115	0.292
Q does not Granger Cause S	10.125	0.002
S does not Granger Cause V	0.698	0.404
V does not Granger Cause S	7.691	0.006

Source: Authors' estimations.
Note: The lag length of all focus variables is 1.

4.2. Granger Causality Analysis

Panel Granger causality analysis has been used to analyse the causal direction between considered variables. We use lag one of all variables judge the causal relationship between dependent and independent variables. The Table 13 presents the results of Granger causality analysis.

Results of Table 13 confirm that the human capital development has unidirectional causal relationship of with all our focus variables i.e. workers' remittances and all five dimensions of good governance. The direction of the causal relationship is run from regressor to human capital development in all considered focus variable. These findings confirm that our considered focus variable has significant causal influence on human capital development.

5. CONCLUDING REMARKS

This study investigates the influence of workers' remittances along with economic governance system on human capital development in 17 countries by using the annual panel data of 18 years from the period of 1996 to 2013. The study employs five different variables of economic governance system to analyse the impact of governance system on the development of human capital i.e. control on corruption in the economic system, government effectiveness, political stability, regulatory quality and the voice and accountability. Three main income level groups are formed in the sample while the low income and lower middle income countries are merged to form a one group and named them as low income countries. The other two groups are for middle income and high income countries.

Pedroni panel cointegration and Kao residual panel cointegration approaches confirm the valid long run relationship between considered variables. Results of fixed effect model complete sample indicate that the workers' remittances have a significant positive impact on the human capital development. Results also indicate the positive and significant impact of all variables of economic governance system on human capital development. Results of low, middle and high income countries show the positive and significant impact of workers' remittances on human capital development in all three income level countries. The highest contribution of workers' remittances on human capital development is found in low income countries. Results also show the positive and significant impact of all variables of economic governance system on human capital development in all three income levels countries. The highest contribution of control on corruption and voice and accountability on human capital development is found in low income countries. Conversely, the highest contribution of government effectiveness and political stability on human capital development is found in high income countries. Finally, the highest contribution of regulatory quality on the development of human capital is found in middle income countries.

The empirical results show that the interaction terms of five governance variable with workers' remittances have positive and significant impact on human capital development. The coefficients of all five interaction terms have more value than the basic model of workers' remittances. Hence, it can be concluded that the strong economic governance system strengthen the relationship between workers' remittances and human capital. Results also show the positive and significant impact of interaction terms of economic governance system with workers' remittances on human capital development in all three income level countries. The highest contribution of all interaction terms on human capital development is found in low income countries. Results of Granger causality confirm that the human capital development has unidirectional causal relationship with workers' remittances and variables of economic governance system. The direction of the causal relationship is run from regressor to human capital development in all considered focus variable. These findings confirm that our considered focus variables have significant causal influence on human capital development in countries. In this way, overall this study supports the prior studies that migrant remittances lead to a positive influence in human capital measure by schooling.

Empirical findings of the study suggest that apart from promoting good governance, appropriate and effective macroeconomic policy is required in order to attract more international remittances and promote human development. Similarly, exclusive policies including condensing the cost of money transfers from overseas and improving mechanisms to utilise migrant's remittances more efficiently needs to be fuelled. Every state needs to ensure that they generate the facilitating environment that will enhance investment into constructive infrastructure. Consequently, the enhanced level of investment through migrant remittances will certainly generate more employment opportunities.

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