Human Capital, Governance and Poverty Reduction: A Panel Data Analysis

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ARTICLEDETAILS	ABSTRACT
History *Revised format: May 2018* *Available Online: June 2018* **Keywords** *Poverty, Human Capital, Governance, Panel Data, Generalized Method of Moments (GMM).* **JEL Classification:** I32, J24, P48, D02, C33, C82	The objectives of the study are to examine the influence of Human Capital and Governance on Poverty. For this purpose, the study considers 44 developing countries and chooses time span from 2004 to 2017. The data on all variables are collected through World Development Indicators. The study utilized the index for human capital and three governance indicators i.e. Political Governance, Economic Governance and Institutional Governance developed by World Bank Organization. Generalized Method of Moment (GMM) is employed on the panel data for estimation of Econometric results. The results conclude that Human Capital and High Technology Exports are found to be significant causes of reduction in Poverty in Developing countries. Moreover, not only Political Governance, Institutional Governance, Economic Governance but also Overall Governance are reducing poverty in developing countries. Gross Fixed Capital formation and Trade Openness are found to be statistically insignificant. On the other side, Savings for Natural Resource Depletion is examined as increasing poverty in developing countries.

1. Introduction

No society can surely be flourishing and happy, of which by far the greater part of the numbers are poor and miserable (Smith, 1776). In pursuance of economic development poor section of the society is neglected not only in context of living standards but also in human capital development. Poor people are unable to meet even their necessities such as health, education, shelter and essential nourishment. There has been continuing debate over the issue of poverty. Many researchers investigated the determinants of poverty in different context. After investigating the traditional factors of poverty, researchers switched to other most important factors such as health and education which are considered as the main ingredients of human capital.

Recent figures of World Bank reveal that there are 769 million people in the world who live below international poverty line of US$1.90. The importance of this issue can be accessed from the commitment of major international organizations. As United Nations puts the poverty at top so the first sustainable goal is "End poverty in all its forms everywhere". According to UN, poverty is more than the lack of

income and resources to ensure a sustainable livelihood. The manifestations of poverty include hunger and malnutrition, limited access to education and other basic services, social discrimination and exclusion as well as the lack of participation in decision-making. Economic growth must be inclusive to provide sustainable jobs and promote equality rather than just increase the level of GDP and most especially GDP per capital. Hassan and Birungi (2011) confirm the negative impact of human and social capital on poverty reduction through household income and its impact on household welfare. Human capital augmented with quality education affects national income which significantly reduces the poverty (Afzal et al., 2011).

Factors such as health, nutrition, and formal education, which an individual embodies and which provide future returns, are components of what is coined as "human capital". At the same time, as mentioned above, one should recognize that these factors are consumables as well. As such, an increase in a person's income will in turn lead to an increase in the demand for these components of human capital given that they are normal goods.

The emergence of institutional economics opened the new door of investigation into the issue of poverty. Initially, corruption was considered as indicator of governance and its impact on poverty was investigated along with interaction term of growth and investment by Mauro (1995); Knack and Keefer (1996).Studies suggest that investment in human capital is the precondition for developing countries to absorb modern technology and improve productivity, which in turn leads to higher income and improved economic performance (Barro, 1991; Mankiw et al., 1992; Romer, 1990).

This paper presents the effect of Human Capital and Governance on poverty considering developing countries. . The empirical findings of this examination will assist the concerned authorities to formulate the public policies and programs for poverty reduction through human capital development.

This paper is organized as follows. In the next section, a review of selected literature on the relationship between human capital, governance and poverty is presented. This is followed by the baseline econometric model to be estimated. After this, data and methodological issues are discussed. Empirical results are reported in subsequent section of results and discussion. The final section gives concluding remarks and policy recommendations.

2. Literature Review

Gupta, Davoodi and Alonso-Terme (2002) investigated the impact of corruption on the income inequality and poverty. Regression results of the study showed the positive impact of corruption on income inequality and poverty and policy to curtail the corruption had been suggested. Quang Dao (2007) examined the effect of different components of human capital on severity of poverty and income distribution in developing countries. Least square estimation confirmed the dependence of poverty and income distribution on multiple factors of human capital such as gender parity in schools, prevalence of child malnutrition, birth attended by skilled professionals and primary school completion. Tebaldi and Mohan (2010) used the panel data of countries to determine the impact of institutions on income distribution and poverty. Results of panel regression showed that control of corruption, political stability and government effectiveness contributed to economic growth which in turn affect the income distribution positively and reduce poverty.

Bakhtiari and Meisami (2010) explored the influence of health and education as the main ingredients of human capital on income distribution and poverty in Islamic countries. Results of panel data revealed the significant impact of health and education on poverty. The study suggested the improvement in health and education infrastructure for improving income distribution and poverty reduction. Janjua and Kamal (2011) pointed out the education as key factor in poverty reduction. Results of GLS estimation showed that income growth contributed to poverty alleviation but income distribution did not play a significant

role in poverty reduction. Gounder and Xing (2012) highlighted the economic (household income) and social factors (health and education) of poverty in terms of monetary and non-monetary context. 2SLS and logistic regression was used on data from Household Income and Expenditure Survey, 2002/03 of Fiji. Findings pointed out the significant impact of education on not only household income but also on household activities to improve the health status as non-monetary measure of poverty.

Dias and Tebaldi (2012) analyzed the relationship among institutions, human capital and growth for the period of 1965 – 2005. Empirical results of dynamic panel data estimated through GMM showed that human capital and as well as physical capital instead of levels determined long run economic growth. Perera and Lee (2013) examined the impact of economic growth and institution quality on poverty and income inequality in Asia for the period of 1985 – 2009. Results of GMM estimation showed that economic growth leads to low poverty although improvements in the level of corruption, democratic accountability, and beauracratic quality appear to increase poverty levels but improvements in political stability and law and order situations reduce the poverty levels.

Akanbi (2015) examined the empirical relationship between governance, physical infrastructure and levels of poverty in Sub-Saharan Africa. Empirical results of 2SLS estimation revealed that governance and infrastructure are significant determinants of the poverty in the region. Muhammad, Egbetokun, Memon, and Hyder (2015) explored the role of governance in the relationship between human capital and economic growth. Empirical results of fixed effect model estimation showed in most of the cases it has been found that the relationship between human capital and economic growth is insignificant for countries with low level of governance. Ayodeji and Adebayo (2015) identified the reasons of poverty in Nigeria and theoretical and conceptual framework has been presented to describe the relationships among government policies, human capital, economic development and poverty reduction.

Faria, Montesinos-Yufa, Morales, Navarro, (2016) attempted to separate the role of human capital and economic institutions in development process. Findings of the study showed that economic institutions and policies are strongly linked to development. Human capital measured by cognitive skills showed a strong effect on institutions. Zghidi, Sghaier and Abida (2016) investigated the causal link between remittances, economic freedom and economic growth in North African countries. GMM results estimated for four countries showed positive relationship between remittances and economic growth. Effects of remittances were more pronounced in presence of the economic freedom variable.

Oyinlola and Adedeji (2017) examined the role of financial development in human capital growth relationship. Results of GMM estimation revealed the presence of positive direct impact of both human capital and financial development on inclusive growth. Akobeng (2017) investigated the effect of GFCF on poverty and explored whether the GFCF and poverty relationship can be strengthened in the presence of institutions. Results of GMM estimation showed that GFCF appeared to be negatively signed and are significant across the poverty measures. The interaction of GFCF and institutional democracy is negative and significant.

3. Data, Models and Methodology
3.1   Data and Methods
The study utilizes panel data of 44 developing countries (see table 1) over the period from 2004 to 2017. The Data used in this study is taken from three sources like World Development Indicators and World Governance Indicators managed by World Bank Organization and Penn World Table 8.0. Units of measurements, data sources and variable definition are given in table 1 in more details.

The results of the study are measured at three stages. At first stage, descriptive statistics are calculated; secondly, correlation analysis is done to check problem of Multicollinearity and lastly, GMM methods is applied for econometric results of all the models to examine the impact of human capital and Governance on poverty reduction. GMM method is much suitable to solve the problem of endogeneity present in the

models. More technically, OLS does not account for un-modeled and un-observed country-specific variations. Therefore, OLS coefficients might be distorted due to significant correlations between un-observed country specific factors. In this way simple OLS can provide bias coefficients.

Table 1   List of Developing Countries in the Study

S. No.	Name of Country	S. No.	Name of Country	S. No.	Name of Country	S. No.	Name of Country
1	Argentina	12	Ecuador	23	Kazakhstan	34	Portugal
2	Armenia	13	El Salvador	24	Kyrgyzstan	35	Romania
3	Australia	14	Estonia	25	Latvia	36	Serbia
4	Belgium	15	Finland	26	Lithuania	37	Slovakia
5	Bolivia	16	Greece	27	Netherlands	38	Slovenia
6	Brazil	17	Honduras	28	Norway	39	Spain
7	Costa Rica	18	Hungary	29	Pakistan	40	Swaziland
8	Cyprus	19	Iceland	30	Panama	41	Thailand
9	Czech Republic	20	Indonesia	31	Paraguay	42	Turkey
10	Denmark	21	Ireland	32	Peru	43	Ukraine
11	Dominican Republic	22	Italy	33	Poland	44	United Kingdom

Note: Author's own compilation

3.2   Model Specification
Keeping in view the objectives of the study that is to see the effect of Human Capital and Governance on Poverty, the study specifies following models with few variations.

3.2.1   Model 1
$$HCI_{it} = \beta_1 + \beta_2 HC_{it} + \beta_3 GCF_{it} + \beta_4 SNRD_{it} + \beta_5 TOP_{it} + \beta_6 TECH_{it} + \epsilon_{1t}$$

3.2.2   Model 2
$$HCI_{it} = \beta_1 + \beta_2 HC_{it} + \beta_3 GCF_{it} + \beta_4 SNRD_{it} + \beta_5 TOP_{it} + \beta_6 TECH_{it} + \beta_7 PGOV_{it} + \epsilon_{2t}$$

3.2.3   Model 3
$$HCI_{it} = \beta_1 + \beta_2 HC_{it} + \beta_3 GCF_{it} + \beta_4 SNRD_{it} + \beta_5 TOP_{it} + \beta_6 TECH_{it} + \beta_7 EGOV_{it} + \epsilon_{3t}$$

3.2.4   Model 4
$$HCI_{it} = \beta_1 + \beta_2 HC_{it} + \beta_3 GCF_{it} + \beta_4 SNRD_{it} + \beta_5 TOP_{it} + \beta_6 TECH_{it} + \beta_7 IGOV_{it} + \epsilon_{4t}$$

3.2.5   Model5
$$HCI_{it} = \beta_1 + \beta_2 HC_{it} + \beta_3 GCF_{it} + \beta_4 SNRD_{it} + \beta_5 TOP_{it} + \beta_6 TECH_{it} + \beta_7 GOV_{it} + \epsilon_{5t}$$

Where HCI is Poverty Head Count Ratio, HC is Human Capital Index, GCF is Gross Capital Formation, SNRD is Adjusted Saving, TOP is Trade Openness, TECH is High Technology Exports, PGOV is political governance, EGOV is Economic Governance, IGOV is Institutional Governance and GOV is overall governance.

Table 2: Description of Variables

Variable	Description/ Measurement	Data Sources
HCI	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	World Development Indicators
HC	Index of human capital per person based on years of schooling and return to education.	Penn World Tables 8.0
GCF	Gross fixed capital formation (constant 2010 US$)	World Development Indicators
SNRD	Adjusted savings: natural resources depletion (% of GNI)	World Development Indicators
TOP	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Development Indicators
TECH	High-technology exports (% of manufactured exports) High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.	World Development Indicators
PGOV	A composite index construct by Principal Component Analysis (PCA) based on the data of two governance indicators i.e. Voice and Accountability (VA) and Political Stability and No Violence (PSNV).	World Governance Indicators
EGOV	A composite index construct by Principal Component Analysis (PCA) based on the data of two governance indicators i.e. Government Effectiveness (GE) and Regularity Quality (RQ).	World Governance Indicators
IGOV	A composite index construct by Principal Component Analysis (PCA) based on the data of two governance indicators i.e. Rule of Law (RL) and Control of Corruption (CC).	World Governance Indicators
GOV	A composite index construct by Principal Component Analysis (PCA) based on the data of all six World Governance Indicators.	World Governance Indicators

Note: Author's own compilation.

4. Results and Discussion

As per objectives of the paper which is to identify the impact of human capital and globalization on poverty. So, to capture the effects of human capital by including three dimensions and overall governance on poverty, five models ate estimated by using GMM estimation. The descriptive statistics for the variables used in the paper are presented in the table 3.

Table 3:   Summary Statistics

Variable	Mean	Max	Min	Std. Dev.
HCI	2.8842	28.0000	0.0000	4.9426
HC	2.9049	3.7342	1.5209	0.4925
GCF	22.3179	43.6198	11.4413	5.4747
SNRD	1.7904	17.5182	0.0000	2.7574
TOP	92.4159	216.1867	22.1059	40.6716
TECH	19.9207	1747.509	0.0765	111.5052
VA	0.5329	1.8009	-1.4948	0.7984
PSNV	0.1930	1.6202	-2.81	0.7888
GE	0.4575	2.3539	-1.0538	0.9015
RQ	0.5554	1.9251	-1.2962	0.8347
RL	0.3510	2.1003	-1.3715	0.9951
CC	0.3143	2.4699	-1.3733	1.0274

Sources: Authors' own calculation based on the data taken from the sources mentioned above.

The mean for head count index is 2.88 with the maximum and minimum values of 28 and 00 respectively. Human capital has mean value of 2.90 with maximum and minimum value of 3.73 and 1.52 respectively. Among governance indicators having the range of -2.5 to +2.5, voice and accountability and regulatory quality have maximum value of mean 0.53 and 0.55 respectively with maximum 1.80, 1.92 and minimum -1.49, -1.37 values.

Table 4 illustrates the bivariate correlation of the variables. There is a strong significant negative association between index of human capital per capita and head count index as poverty measures with correlation coefficient of -0.502 for the poverty headcount. The association between all six indicators of governance and the poverty measure significantly negatively correlated with correlation coefficients of -0.423, -0.551, -0.526, -0.542, -0.551 and -0.486 respectively. Table 5 presents the results of GMM estimation for 5 different models in which impact of human capital is determined in the presence of different dimensions of governance.

GMM estimation results of model 1 in which human capital along with other economic variables is used as main determinant of poverty shows the negative and significant impact on head count index as measure of poverty although GFCF, savings of natural resource depletion have positive and significant impact on poverty but trade has insignificant impact on poverty although it is positive. The impact of high technology exports on poverty is negative in first model. The signs of coefficients are logically and economically valid. As the human capital per person increased meaning when people acquire more knowledge and skills the income levels are enhanced that lower the proportion of the population living on or below the poverty line.

In second model in which political governance is used along with the same variables used in first model, signs of coefficients remain the same and political governance affects the poverty negatively and significantly at 1% level with the value of coefficient -0.712 with the introduction of political governance in the model there is a slight change in the value of coefficient for human capital and improvement in the value of R-squared. Empirical results of model 3 in which political governance is replaced with economic governance show the significant and negative impact of economic governance on the poverty the value of coefficient -0.892 with the improvement in the coefficient for human capital although the impact of the other variables on the poverty remain same throughout the models.

Economic governance is replaced with institutional governance in fourth model and its results show the negative and significant on poverty although coefficient for human capital is slightly reduced but still

more than the coefficients in model 1 and 2. In fifth model all six governance indicators are combined to form overall governance and its impact through human capital on poverty is estimated. Results show the negative and significant impact of governance on poverty and impact of other variables including human capital remain the same throughout the other models. Although the impact of human capital on poverty is slightly different with the introduction of different dimensions of governance but results prove that governance does matter for human capital to have a negative impact on poverty.

Good governance is very useful for effective public policies relating to health, education and skill development which boost the level of human capital which in turn increase the income levels and reduced poverty by raising the living standards. Results estimated in the paper are consistent with the economic theory and are aligned with the results estimated by the other researchers (Tebaldi and Mohan, 2010; Janjua and Kamal, 2011; Akanbi, 2015; Perera and Lee, 2013).

Table 4:   Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. HCI	1											
2. HC	-0.502	1										
3. GCF	-0.043	0.202	1									
4. SNRD	0.315	-0.024	0.018	1								
5. TOP	-0.193	0.284	0.135	-0.271	1							
6. TECH	-0.010	0.003	0.264	-0.045	0.092	1						
7. VA	-0.423	0.569	0.009	-0.399	0.161	0.020	1					
8. PSNV	-0.551	0.611	0.086	-0.311	0.336	0.004	0.768	1				
9. GE	-0.526	0.590	0.052	-0.360	0.238	0.018	0.871	0.760	1			
10. RQ	-0.542	0.594	0.126	-0.442	0.290	0.012	0.851	0.759	0.930	1		
11. RL	-0.551	0.582	0.028	-0.400	0.242	-0.007	0.889	0.783	0.971	0.948	1	
12. CC	-0.486	0.511	-0.019	-0.310	0.171	-0.0184	0.868	0.750	0.957	0.898	0.963	1

Sources: Authors' own calculation based on the data taken from the sources mentioned above.

Table 5:   **GMM Estimation Results**

Dependent variable: Poverty	Poverty Head Count Index: Dependent Variable				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Human Capital Per Person	-3.632 (0.0000)	-3.656 (0.0000)	-5.162 (0.0000)	-3.972 (0.0000)	-3.777 (0.0000)
Gross Fixed Capital Formation	0.049 (0.0610)	0.036 (0.2963)	0.043 (0.2009)	0.027 (0.4298)	-0.034 (0.3263)
Savings for Natural Resource	0.554 (0.0000)	0.433 (0.0000)	0.377 (0.0000)	0.402 (0.0000)	0.385 (0.0000)
Trade Openness	0.004 (0.4444)	0.003 (0.4628)	0.003 (0.4561)	0.003 (0.5795)	0.003 (0.5113)
High Technology Exports	-0.001 (0.7593)	-0.009 (0.8165)	-0.004 (0.7671)	-0.005 (0.7481)	-0.004 (0.7834)
Political Governance		-0.712 (0.0000)			
Economic Governance			-0.892 (0.0000)		
Institutional Governance				-0.855 (0.0000)	
Overall Governance					-0.533 (0.0000)
CONSTANT	15.471 (0.0000)	12.548 (0.0000)	11.558 (0.0000)	12.305 (0.0000)	11.732 (0.0000)
Observations	506	506	506	506	506
R-squared	0.3478	0.4640	0.377805	0.380369	0.376821
Durban-Watson stat	0.109317	0.101111	0.100364	0.102222	0.099819

Sources: Authors' own calculation based on the data taken from the sources mentioned above.

5. Concluding Remarks

The ultimate objective of the paper was to estimate the impact of human capital on pervert ratio in developing countries in the presence of governance level in selected countries. Panel GMM approach is exploited to meet the objective of study by using data for 44 developing countries. The central opinion of this paper after GMM estimation is that human capital and globalization are key instruments to reduce poverty. Additionally, governance measures such as political governance (voice and accountability and Political stability and no violence), economic governance (government effectiveness and regulatory quality) and institutional governance (rule of law and control of corruption) interact with the human capital to reduce poverty.

The results of correlation matrix show that there is no Multicollinearity in the models. Multicollinear variables are added in separate models like Political Governance, Economic Governance, Institutional Governance and Governance. The results conclude that Human Capital and High Technology Exports are found to be significant causes of reduction in Poverty in Developing countries. Moreover, not only Political Governance, Institutional Governance, Economic Governance but also Overall Governance are reducing poverty in developing countries. Gross Fixed Capital formation and Trade Openness are found to be statistically insignificant. On the other side, Savings for Natural Resource Depletion is examined as increasing poverty in developing countries.

An effective poverty reduction strategy should be formulated while keeping in mind the human capital development through health and education and improving the governance infrastructure. Further, people should be more productive and economically active which is only possible through inclusive growth that may prove as recipe for poverty reduction in developing countries. A successful poverty reduction strategy should be a development strategy that must depend on participation of poor in economic growth. Future research may look at the issue of quality, accessibility and affordability of human capital and poverty reduction relationships.

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