Corruption, Income Inequality and Human Resource Development in Developing Economies: Panel Data Analysis

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INTRODUCTION

- Globally and particularly for the developing economies, the human resource development is the desirable phenomenon along with elimination of corruption and income inequality.
- Human resource development has an important role in economic development (McLean and McLean, 2001) and economic sustainability.
- The human resource development decreases the corruption through more awareness, education, knowledge, employment generation and political participation.

- There are other channels by which human resource development may restrict the corruption that is efficiency of administrative institutions and governance (Tran, 2008).
- The human resource development also affects the income inequality in an economy through employment opportunities, access to productive resources, financial credit, and enhanced wages.

On the other hand

- Corruption that is a symptom of deep institutional weaknesses leads to inefficient economic, social, and political outcomes.
- It reduces economic growth (Lee et al, 2000; Dridi, 2013), development (Firsch, 1996), expenditures for education and health (Dridi, 2014);

It increases inflation, military expenditures (lee et al 2000) poverty (Yusuf et al, 2014), child and infant mortality rates (Gupta et al, 2000);

And

- Corruption increases income inequality in the nations (Gupta et al, 2002).
- It adversely affects human resource development through a variety of channels (Aksay, 2006; De la Croix and Delavallad, 2009; Dridi, 2014).

The income inequality in an economy

 Influences the economic growth (Barro, 2000; Kafi and Zouhaier. 2012), environment, civil and political participation of the people, social and economic opportunities and choices and economic freedom.

and

- It enhances corruption (Apergis et al, 2010; Chong and Gradestin, 2007).
- It devastates the human resource development through the pronounced argument of low opportunities of education and health for the low income group and inferior quality of the education and health for this income group.

EXISTING LITERATURE

- A number of studies has attempted to explore the relationship between these variables (Barreto 2001; Glaser, et. al. 2003 for corruption and inequality; Akcay 2006; Boikos 2016 for corruption and human resource development; You and Khagram 2005; Apergis, et. al. 2012 for corruption and inequality) but simultaneous relationship is non-existent in the literature.
- The current study is an addition to the literature and may be distinguished from the prior studies as it analyzed the corruption, income inequality and human resource development simultaneously.

OBJECTIVES

 The objective of the study is to probe the interdependence of corruption, income inequality and human resource development for developing economies.

METHODOLOGY

The analysis is concerned with interdependence among human resource development, corruption and income inequality. The model contains three endogenous variables along with a number of exogenous variables as shown in the functions.

Table 1: Description of Variables and source of data

Variables	Measurement	Sources of data	Expected sign
HRD (Human resource development)	Human resources development index	Penn World (2015) and WDI (World Bank 2016a)	-ive for CORRP and GINI
CORRP (Corruption)	Control of corruption index ranging -2.5 to +2.5.	WB Governance Indicator (World Bank 2016b)	-ive for HRD and +ive for GINI
GINI (Income inequality)	Gini coefficient index ranging o to 1.	WIID (UNU-WIDER 2016) and WDI (World Bank 2016a)	-ive for HRD and +ive for CORRP
URBAN (Urbanization)	Urban population as percentage of total population	WDI (World Bank 2016a)	+ive for HRD, -ive for CORRP and +ive or -ive for GINI
HEXP (Health expenditure)	Health expenditure as percentage of GDP	WDI (World Bank 2016a)	+ive for HRD

Variables	Measurement	Sources of data	Expected sign
EFREE (Economic freedom)	Economic freedom index ranges o to 100, where o represent the minimum freedom. 100 represent maximum freedom.	The Global Economy (Global Economy 2016)	+ive for HRD
GFCF (Gross fixed capital formation)	Gross capital formation as percentage of GDP	WDI (World Bank 2016a)	+ive for HRD
PINSTAB (Political instability)	Political stability and absence of violence/terrorism	WB Governance Indicator (World Bank 2016b)	-ive for HRD
UEMP (Unemployment)	Total youth unemployment as percentage of labor force	WDI (World Bank 2016a)	+ive for CORRP
GDP (Economic development)	GDP per-capita	WDI (World Bank 2016a)	-ive for GINI
TOPEN (Trade openness)	Trade as percentage of GDP	World Development Indicators (World Bank 2016a)	-ive for GINI
TAX (Tax revenue)	Tax revenue as percentage of GDP	World Development Indicators (World Bank 2016a)	-ive for GINI

All the variables in the model have been measured as they have been given in the source except human resource development index.

Human resource development index has been constructed through principal component analysis by using two dimensions, i.e. health and education with six indicators. The indicators of human resource development are shown in Table 2.

Table 2: Construction of HRD Index

	Dimensions	Indicators	Source of Data	Direction
		Life expectancy	WDI (World Bank 2016a)	+ive for HRD
		Immunization	WDI (World Bank 2016a)	+ive for HRD
HRD Index	Health	Maternal mortality rate	WDI (World Bank 2016a)	-ive for HRD
	Water & sanitation facilities	WDI (World Bank 2016a)	+ive for HRD	
		Infant mortality rate	WDI (World Bank 2016a)	-ive for HRD
	Education	Human capital index	(Penn World 2015)	+ive for HRD

DATASET

- The dataset of 38 developing economies covers the time period 2000-2015.
- The sample of developing countries is based on the availability of data.

Countries covered are:

Argentina, Armenia, Bolivia, Brazil, Bulgaria, Cambodia, Chile, China, Colombia, Costa Rica, Dominican Rep, Ecuador, El Salvador, Honduras, India, Indonesia, Kazakhstan, Kyrgyzstan, Madagascar, Mexico, Moldova, Mongolia, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Russia, Serbia, Sri Lanka, Tajikistan, Thailand, Turkey, Uganda, Ukraine, Venezuela, Vietnam.

MODEL SPECIFICATION

The study used 3SLS technique.

The econometric expression is shown in equations 4, 5 and 6 respectively.

 $\begin{aligned} \mathsf{HRD} &= \gamma_{0} + \gamma_{1} \, \mathsf{CORRP}_{it} + \gamma_{2} \, \mathsf{GINI}_{it} + \gamma_{3} \, \mathsf{URBAN}_{it} + \gamma_{4} \, \mathsf{HEXP}_{it} + \gamma_{5} \\ \mathsf{EFREE}_{it} + \gamma_{6} \, \mathsf{GFCF}_{it} + \mu_{it} \, ----- \, (4) \end{aligned}$

 $CORPR = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 HRD_{it} + \alpha_3 PINSTAB_{it} + \alpha_4 URBAN_{it} + \alpha_5 UEMPit + \mu it ----- (5)$

GINI = $\beta_0 + \beta_1 CORRP_{it} + \beta_2 HRD_{it} + \beta_3 GDP_{it} + \beta_4 URBAN_{it} + \beta_5$ TOPEN_{it} + $\beta_6 TAX_{it} + \mu_{it}$ ----- (6) Where i is for each country and t is for time series. The HRD, CORRP and GINI are endogenous variables.

Regressors Endogeneity test (Durbin-Wu-Hausman test)

The regressors endogeneity test, also known as Durbin-Wu-Hausman test is used to see the endogeneity of regressors.

Diagnostic test: The Wald test that is a parametric statistical test examines whether a relationship within or between data items can be expressed as a statistical model with parameters to be estimated from a sample. Wald test is used to test the true value of the parameter based on the sample estimate.

RESULTS AND DISCUSSION

Table 3: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
		2001401011		
HRD	54.77173	5.236762	33.05827	63.92685
CORRP	5134318	.5016278	-1.445456	1.563639
GINI	42.4095	9.046128	24.09	63
URBAN	55.73618	20.54156	12.082	91.751
HEXP	5.992091	1.85007	1.978332	12.48972
EFREE	58.75718	7.439823	34	79
GFCF	23.9668	7.363654	9.413684	58.15073
PINSTAB	5297558	.702812	-2.81208	1.112974
UEMP	15.91102	9.777468	.3	58.3
GDP	3.630688	4.023745	-15.28408	16.23265
TOPEN	75.64306	34.99001	16.00447	199.675
TAX	17.39083	7.295062	7.537844	95.16069
No. of observations = 570				

Durbin-Wu-Hausman Test: Durbin Hausman test is used to check the endogeneity in the model whether it's necessary to used instruments or not. The Prob value is found less than 5 percent which means endogeneity exists in model so we use instruments to remove the endogeneity problem.

Durbin Hausman	Prob>chi2
	0.0000

Table 4: Results of 3SLS for Human Resource Development

Dependent Variable: HRD (Human Resource Development)

No of observations = 530

Variables	Coefficient	Prob.
С	23.40509	0.001***
CORRP	-7.004583	0.001***
GINI	5225533	0.000***
URBAN	.2611419	0.000***
HEXP	1.847068	0.000***
EFREE	.3704132	0.000***
GFCF	.1057335	0.002***
*** represents 1 percent level of significance		

Wald test is applied to test the significance of variables. P value of Wald test is found less than 5 percent hence hypothesis that corruption and income inequality have significant effect on human resource development, is accepted.

Variables	Prob
COR	0.0015
GINI	0.0000

- The 3SLS results show that corruption adversely affects human resource development in developing economies. It is supported by previous literature (Kaufmann et a,. 1999; Rose-Ackerman, 1997; Mo, 2001; Akcay, 2006; Boikos, 2016).
- Inequality also negatively affects the human resource development.
- The economic freedom, urbanization, health expenditures and gross fixed capital formation have shown positive effect on human resource development.

Table 5: Results of 3SLS for Corruption

Dependent Variable: CORRP (Corruption)

No of observations = 530

Variable	Coefficient	Prob.
C	-1.991638	0.094*
GINI	.0974888	0.000***
HRD	0416559	0.079*
PINSTAB	.3945069	0.000***
URBAN	0130396	0.010**
UEMP	.0352951	0.000***
*, ** and *** represent 10, 5 and 1 percent of level of significance		

Wald test is applied to test the significance of variables. P value of Wald test is found less than 5 percent hence the hypothesis that income inequality and human resource development have significant effect on corruption, is accepted.

Variables	Prob
GINI	0.0000
HRD	0.0787

- The results show that income inequality increases the corruption in developing economies (You and Khagram, 2005; Apergis, 2012).
- The human resource development decreases the corruption in developing economies (Mo 2001).
- The political instability and unemployment increase corruption (Glaeser, 2005; Serra, 2006; Churchill et al, 2013).
- The urbanization decreases corruption.

Table 6: Results of 3SLS for Income Inequality

Dependent Variable: GINI (Income inequality)

No of observations = 530 Variable Coefficient Prob. C 0.000 *** 118.7817 **CORRP** 0.024** 4.547218 0.000*** HRD -1.876288 **GDP** 0.208 -.1139623 0.000*** **URBAN** .5431450.000 *** TOPEN .0992419 TAX 0.021 ** -.4933264 *, ** and *** represent 10, 5 and 1 percent of level of significance

Wald test is applied to test the significance of variables. P value of Wald test is found less than 5 percent hence the hypothesis that corruption and human resource development have significant effect on income inequality, is accepted

Variables	Prob
COR	0.0242
HRD	0.0000

The results show that corruption affects income inequality positively (Gyimah-Brempong 2001; Barreto 2001; Glaser, et. al. 2003).

- The human resource development negatively affects income inequality.
- The urbanization and trade openness has positive effect on income inequality.
- The tax revenue has shown negative impact on income inequality.

CONCLUSION

- The results of panel data for a sample of 38 developing countries for the time period 2000- 2015 showed that human resource development is negatively influenced by corruption and income inequality.
- On the other hand corruption is positively influenced by income inequality and negatively by human resource development.
- Similarly the income inequality is positively influenced by corruption and negatively by human resource development.
- In this troika of socioeconomic variables the recommendation may be that to increase the human resource development it is necessary to strike the corruption and inequality simultaneously. It is proposed to eliminate the corruption and to narrow down the income inequality which consequently will boost the human resource development and then a veracious cycle will emerge which boosts human resource development, narrowing down of income inequality and sliding down of corruption.

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