CORRUPTION AS A LIMITING FACTOR FOR EXPENDITURE ON HEALTH AND EDUCATION SECTORS IN SOUTH ASIA: A DYNAMIC HETEROGENEOUS PANEL DATA ANALYSIS

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ABSTRACT: *This research work investigated the hypothesis of the effect of corruption on health and educational sector in South-Asian countries. To test this proposition, we used the sophisticated and improved econometric techniques like Panel unit root test to check the stationary. For co-integration Dynamic Fixed Effect Estimation (DFEE), Mean Group Estimation (MGE) and Pooled Mean Group estimation (PMGE) are used. Then, the Granger Causality is also applied. Empirical results indicate that there is a negative long run relationship between corruption and health or education expenditures in South-Asian countries. So, it is recommended that the anti-corruption agencies should be made to remove corruption in the South-Asian countries.*

Key Words: Corruption Perception Index, Global Corruption Report, DFE, MGE, PMGE.

1. INTRODUCTION

Among the many challenges facing by public service institutions in developing countries, corruption remains one of the most persistent and least challenged. In recent years, consensus arose that corruption is a central challenge to sustainable development. A growing body of research suggests that corruption minimizes the opportunities of private investment, foreign direct investment and foreign aid in developing countries. As a result, the cost of capital increases [15].

In public sector, the government and its decentralized units including the police, military, public roads and transit authorities, primary schools and healthcare system use public funds and provide services based on the motivation to improve citizens' lives rather than to make a profit [27]. Thus, any kind of abuse of entrusted power for private gain that takes place within the government or government body counts is corruption. Public officials can benefit privately in several ways for example bribery, embezzlement, patronage, nepotism and procurement.

Some authors [26] mentioned the occurrence of corruption in the purchase of pharmaceuticals, meals, cleaning services and physical inputs. Similarly, in educational sector, corruption is the misuse of authority for material gain [1; 8,10].

Corruption in the education sector can also take various forms, many of which are parallel to those in the health sector. There can be corruption in teacher's recruitment, salaries, pensions, appearance of unauthorized ghost schools, unauthorized funds and degrees, bribery in the purchase of textbooks, desks, blackboards and other supplies, as well as in the purchase of cleaning services and meals. [5].

Corruption is a serious problem in many Asian countries. In developing countries specifically, the health and education sectors offer plentiful scope for corruption. In each sector, corruption can take place in procurement, recruitment, the theft of money and supplies, absenteeism, induced demand for unnecessary goods and services and accepting bribes for services. Understanding the nature of corruption in these two sectors will both help in getting the means, methods and evaluating the impacts of corruption.

In most developing countries, corruption is wide part of everyday life. Society has learned to live with it, even considering it as an integral part of their culture. According to the [25] Bangladesh is the most corrupt country among the South Asian countries. Score wise Pakistan and Nepal are on second number. After that, India and Sri Lanka are on third position and Bhutan is least corrupt among all.

The study will focus on the research problem that corruption is treated as a dilemma in the South Asian countries because of its impact on various institutions, therefore it is important to study the means, methods and effects of corruption on important sectors of the economy like health and education and to check the extent of corruption that hinders the economic development in South Asian countries.

1.1 Objectives

This paper intends to examine the long run effect of corruption on health and educational sector in South-Asian countries.

On the basis of the objective, following hypothesis shall be tested.

H_A: There exists long run causal relationship between corruption and government spending on social services (Health & Education).

2. LITERATURE REVIEW

According to [21], South Asia is the most corrupt region of the world and governments must strengthen their anti-graft agencies to prevent political interference and protect whistleblowers. In previous years, studies also found the evidences of corruption in South Asian countries.

Others [13] examined the cross country factors which influenced the performance and outcomes of the health care delivery in the developing countries. She explained that absenteeism, corruption, informal payments, and mismanagement are the main challenges which faced the health care delivery in developing countries. The author concluded that good governance is important in certifying real health care delivery.

Some [6] developed a set of hypothesis on the factors affecting corruption in health care. He tested his predictions by OLS technique using EU countries. The OLS technique is chosen in favor of panel data approach due to little variation of variables used. Empirically, showed that corruption in medical sector is dependent on the general level and the specific level. He concluded and suggested important policy measures directed on controlling corruptive actions among doctors and patients. He suggested that to be effective measures expected the decrease in corruption in health care should be systematic based on the proper theory, existent

empirical evidence and local realities and designed to control corruption not only in medical sector but also in the whole country at the general level.

Elsewhere [7] some said that corruption is widely unfavorable to economic performance. In his paper, he examined the effects of corruption on education both from a qualitative or quantitative way. He surveyed 103 countries from the time span of 1980 to 2002. He empirically tested by using the Ordinary Least Square (OLS) technique and two stage least square 2SLS. He found that rising and high corruption level decreases significantly access to schooling. He found that 1-unit increase in corruption decreases enrollment rates by almost 10% points. These finding are robust to use of alternative measure of corruption and other sensitivity analysis. He concluded that although the findings are robust, much more research on the linkages between corruption and education needs to be conducted beyond analyses based on cross-sectional data.

Others [12] explored the impacts of corruption in the health sector in Italy. In this paper, they empirically investigate the causes of Italian health expenditure that was based on a yearly panel data set for the 21 administrative jurisdictions for the period 1998-2008. They collected data on public health system from "Health for All" data set of Italian National Account. Empirical analysis was conducted in two steps, by using the single equation approach with fixed and random effects to examine the variable of interest or they developed a Seemingly Unrelated Regression (SUR) to estimate the impact of corruption on the main four components of public health expenditure in Italy; pharmaceutical, primary care, inpatient and private hospitals. They concluded that in Italy the impact of corruption on health expenditure is positive but also sectorial. Precisely, the empirical analysis demonstrates that corruption in Italy affects pharmaceutical expenditure and private hospital expenditure, suggesting a relation between corruption and the regional governance of Italian health system.

From the previous research study, it has been clear that corruption is badly affecting the health and education services in the South Asian countries. So, we develop our research question to check empirically that how corruption is affecting Health and Education sector in South-Asian countries.

3. THEORETICAL FRAMEWORK

Theoretical framework is the most important part in order to fully understand a research, so the hypothesis is elaborated as vividly as possible. Corruption in education damages all members of society, but effects most heavily those students and families who are weak and needy. While there is limited recent empirical research on the impact of corruption on education, previous studies have identified some important patterns regarding its impact on school attendance and the allocation of resources.

Several studies [4;3,24] have shown negative effects of corruption on education outcomes in cross-sectional analyses. Additionally, [11] and [16] have shown that corruption reduces the share of public expenditures on education. Their results were stronger because they actually control for the general quality of government in their regression, which indicates that it is corruption itself rather than the generally

poor quality of government that is leading to the under allocation of resources to education.

There is a clear relationship between corruption and education expenditures but only a less relationship between corruption and health expenditures, which disappears if income is controlled for. Corruption in education has adverse implications for educational quality and learning outcomes. [15].

Corruption in the health sector also has a direct negative effect on access and quality of patient care. As resources are drained from health budgets through embezzlement and procurement fraud, less funding is available to pay salaries and fund operations and maintenance, leading to de-motivated staff, lower quality of care, and reduced service availability and use [14]. Studies have shown that corruption has a significant, negative effect on health indicators such as infant and child mortality, even after adjusting for income, female education, health spending, and level of urbanization [9]. There is evidence that reducing corruption can improve health outcomes by increasing the effectiveness of public expenditures [3]. Unethical drug promotion and conflict of interest among physicians can have negative effects on health outcomes as well.

From the above several researches effects of the corruption, its causes and consequences in the health and education sector can easily be concluded. Table 1 and Table 2 show a comprehensive view of corruption's effects and consequences.

Table 1: Causes and Consequences of Corruption in Health Sector	
Causes	**Consequences**
Health care professionals	Reduces health care outcomes Reduce resources
Health ministry and management personnel	Lowers quality
Distribution of goods and services	Reduces equity and efficiency
Budget allocation	Increases costs
Procurement of drugs and medical equipment	Decrease effectiveness and volume
Source: [27]	

Table 2: Causes and Consequences of Corruption in Education Sector	
Causes	**Consequences**
Professional (teachers and Professors)	Reduce educational outcomes Increases absenteeism Reduce resources
Perception of corruption	Reduces public investment
Education ministry and management personnel	Lowers quality
Distribution of goods and services	Reduces equity and efficiency
Budget allocation	Increases costs
Procurement of goods and books	Decrease quality and facilities
Source: [27]	

To check the effect of corruption, the Corruption Perception

4. DATA AND METHODOLOGICAL ISSUES

For this research, secondary data is used. The panel data

technique is used over the six South Asian countries from 1996-2014. The countries from the South Asian region has been selected on the basis of the availability of data. So the countries include Pakistan, India, Bangladesh, Nepal, Sri Lanka and Bhutan.

Indicator (CPI) is used. The data for the two variables Health Expenditure and Education Expenditure are obtained from WDI.

First of all, the Im, Pesaran and Shin (IPS) unit root test has been used to check the stationarity. Secondly, we determined the long run co-integration by Dynamic Fixed Effect Estimator (DFEE), Mean Group Estimator (MGE) and Pooled Mean Group Estimator (PMGE). In the end, to check the causality, Panel Granger Causality test is applied.

For estimation, two separate   e models are developed for the analysis and these econometric models are given below:

$$H_{it} = \beta_o + \beta_1 CPI_{it} + \varepsilon_{it}$$
$$E_{it} = \beta_o + \beta_1 CPI_{it} + \varepsilon_{it}$$

Where,

CPI = Corruption Perception Index
H = Government expenditures on Health
E = Government expenditures on Education
ε = Error term

Table 3: Im, Pesaran and Shin (IPS) Unit Root test		
Variable	**At level**	**First difference**
$E_{i,t}$	0.1945 (0.577)	-3.8011 (0.000)
$H_{i,t}$	2.6021 (0.995)	-2.8543 (0.002)
$CP_{i,t}$	3.2176 (0.999)	-3.2497 (0.000)
Source: Authors' estimates		
Note: p-value in parenthesis.		

Im, Pesaran and Shin (IPS) in the above table show that all the variables are stationary at the first difference. The Null hypothesis that unit root exists in each of the panel series is rejected at 5%.

Table 4: Cointegration Results (South Asian Countries)						
	E=f(CPI)			**H=f(CPI)**		
	MGE	**DFEE**	**PMGE**	**MGE**	**DFEE**	**PMGE**
Long Run Parameters						
CPI	-1.8080(0.009)	-1.1779(0.000)	-1.6611(0.000)			
				-0.6115(0.018)	-1.0178(0.006)	-0.6716(0.000)
Average Convergence Parameter						
ECT (φ_i)	-0.3658(0.000)	-0.3366(0.000)	-0.2304(0.000)	-0.5989(0.000)	-0.2968 (0.005)	-0.4416 (0.000)
Short Run Parameters						
Δ(CPI)	0.2669(0.006)	0.2550(0.002)	0.2617(0.008)			
				0.2245(0.006)	0.1779 (0.111)	0.1585 (0.196)
Const.	1.0072(0.000)	0.9573(0.000)	0.6982(0.003)	2.6956(0.005)	1.1422(0.011)	1.9914(0.004)
Source: Authors' estimates						

For co-integration, DFEE Technique, MGE Technique and PMGE Technique has been applied. It has become a common practice to compare the techniques of panel cointegration [17, [18, 19, 20, 21]. The combined results are as follows:

Table 4 shows the results of the cointegration. It consists long-run parameters, short-run parameters and the Error Correction Term, Intercepts are reported in the above table.

The PMGE shows a negative and significant relationship between Corruption Perception Index (CPI) and health and education expenditures in the long run which means that if CPI increases by 1% in the long run, educational expenditures will on average decrease by 1.661% and the health expenditures will on average decrease by 0.67%. The Error Correction Term (ECT) φ of the education model (-0.2304) and health model (-0.4416) are negative which is less than 1 and it is not much high. This implies that the models do not return immediately to equilibrium after a shock that push the economy away from the equilibrium.

Table 5: Hausman Test for Education Model Choosing between	
MGE & DFEE	**MGE & PMGE**
H_0 = DFEE is an efficient and consistent estimator while MGE is not efficient.	H_0 = PMGE is an efficient and consistent estimator while MGE is not efficient.
p-value = 0.834 > 0.05	p-value = 0.829 > 0.05
Do not reject H_0, DFE estimator is consistent and efficient.	Do not reject H_0, PMGE estimator is consistent and efficient.
Source: Authors' estimates	

Table 6: Hausman Test for Health Model Choosing between	
MGE & DFEE	**MGE & PMGE**
H_0 = DFEE is an efficient and consistent estimator while MGE is not efficient.	H_0 = PMGE is an efficient and consistent estimator while MGE is not efficient.
p-value = 0.5322 > 0.05	p-value = 0.780 > 0.05
Do not reject H_0, DFE estimator is consistent and efficient.	Do not reject H_0, PMGE estimator is consistent and efficient.
Source: Authors' estimates	

Hausman Test is applied to choose the appropriate estimator from MGE and PMGE. The null hypothesis is that PMGE is efficient and consistent but MGE is inefficient against the alternative hypothesis that PMGE is not efficient and consistent but MGE is efficient. The hypothesis also allows to decide between MGE and DFEE. In both models, i.e. Education and Health, the suitable technique is found as PMGE.

Table 7: Granger Causality Test Results

	F-stat.	p-val.	Remarks
CPI → E	18.640	0.000	Corruption hampers Education spending.
E → CPI	0.361	0.697	
CPI → H	20.096	0.000	Corruption hampers Health spending.
H → CPI	0.082	0.921	
Source: Authors' estimates			

Table 7 display the granger-causality results between corruption perception index and the spending on Health & Education, respectively. In both cases the causality runs from corruption to spending. It implies that corruption has the tendency to hamper the expenditure on health and education.

4. CLOSING REMARKS

This research study reviewed evidence on the nature and forms of corruption in the health and education sectors, in the Six South Asian countries e.g. Bangladesh, Pakistan, Nepal, Sri Lanka India and Bhutan. This study investigated the above mentioned hypothesis and concluded that the Corruption Perception Index (CPI) shows a negative and significant relationship between and health expenditures and education expenditures in the long run. Thus, this study highlighted that the situation of corruption in South Asian countries is in the red alert zone among the 175 countries.

Therefore, it is recommended that, these countries must ensure that anti-corruption agencies should be independent. They should not be politicized for their personal motives and gains. Government agencies must stop attempts to interfere and to limit their actions against corruption.

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