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The Relationship Between Government Size, Economic Volatility, and Institutional Quality: Empirical Evidence from Open Economies

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Abstract

The size of the government is one of the most fundamental debates of open economies. In any economy, government plays an important role, but a pertinent level of economic prosperity has never been obtained in history without government. Therefore, the objective of this paper investigates the association of government size, economic volatility, and institutional quality for 182 economies from the time period 1996–2016 is collected from the World Bank database. GE is defined as the General government's final consumption expenditure. Health expenditure is represented by HE. Government expenditure on education is denoted by EDUEXP. The economic volatility is measured by the rolling standard deviation of GDP per capita growth rate, Population growth, Trade openness, GINI represented Gini index which measures the degree to which the income distributed or consumption expenses among citizens deviates from a perfectly equal distribution. The results proposed that economic volatility has a significant effect on government size and institutional qualities. Moreover, the paper extends the investigation by finding the link between economic volatility with government health and education expenditure separately. The policy implication drawn from this analysis is that controlling economic volatility may reduce the size of government and also significantly affect health and education expenditures.

Keywords: Government Size, Population, Trade Openness, Wager's Law, Economic Volatility

JEL Classification Code: F10, H50, H51

1. Introduction

In any economy, government plays an important role; however, without pertinent government level of economic prosperity has never been obtained in history. The main objective of the government is to produce goods and services for the society, which includes national defence and roads; it also transfers income to the poor by collecting taxes and regulating economic activities. Therefore, the size of the government is one of the most fundamental debates of open economies. The government size can be measured by the expenditure of the government (Labonte, 2010). Therefore, the dynamic and the structure of government size have been growing attention in the literature. The size of government expanded in most economies after World War II (Cooke, 2003). Later, in the 1980s many economies have undertaken to constrain the growth and size of government under the name of reinventing the public sector and new public administration (Wu & Lin, 2012). In the 19th century (Wagner, 1893) formulated a law with respect to the long-run propensity of government expansion to progress compared to national income. The law implied that government expenditure was considered as a consequence of an endogenous factor instead of the reason for income growth, while Keynesian treated the government expenditure as an exogenous factor and it could be used as a policy instrument.

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Wagner (1893) proposed the first theory related to government expenditure which suggests that as a state develops, the importance of government spending will grow. In other words government expenditure also increases with the income level of the country to meet the demand of the public. On this basis, the paper identifies the economic volatility effect on government size. Furthermore, government expenditure theory is reflected as the theory of costs, which transfers goods and services through the government budget or pertinent regulation. However, the growth of government expenditure is focused on two main approaches; growth in government size which is in absolute terms, and the growth in government size with respect to economic development. In addition, Brown and Jackson (1990) exhibited that government expenditure classifies into two main categories; one is government expenses and the other is government transfers. Exhaustive government expenditure is public purchases of consumables, labor, as well as capital goods and services. It has been argued by the economist that the greater the size of the government the higher the crowding-out effect due to the high opportunity cost.

Government size can be a very tricky thing to compute; with all the irregularities and inefficiencies within governments, stern accountability mechanisms are needed to get accurate government size figures (see Appendix 1). To measure accountability, we must define governance first. Francis Fukuyama (2013) defined governance in the following way 'a government's ability to make and enforce rules, and to deliver services.' A universal definition of governance that each economy applies to itself will lead to a more accurate measure of government size.

On the other hand, inflation and population are also the determinants that affect the government size (Ukwueze, 2015). Age distribution changes are due to the changes in population expansion, which changes the education expenditure and the old aged benefits. The population change also affects the provision of other services like defense, police, and health services. Besides, trade openness is attributable to the category for government size in open economies as more trade openness is linked with government expenditure. Therefore, the main objective of this paper is to find the link between government size, economic volatility, and institutional qualities. This paper aims to contribute to the ongoing debate on the effect of institutional quality on government consumption. The paper uses a panel consisting of 182 open economies with time series from 1996–2016. The effect of government size, economic volatility, and institutional qualities are measured by fixed effect and random effect. The paper is organized as follows; Section 2 contains a literature review, Section 3 includes data sources and econometric methodology, Section 4 exhibits empirical analysis, and Section 5 shows the conclusion.

2. Literature Review

This section summarizes the existing literature on the importance of government size, economic volatility, and institutional qualities. Pisani-Ferry et al. (2008) exhibited a link between government size and economic volatility and found that this relationship redirects temporary development. Wu and Lin (2012) found in China's case that Wagner's Law does not hold and that trade openness facilitates public sector downsizing and increases allocative efficiency. Tobin (2005) and Zhu and Krug (2005) documented that when a society becomes more affluent, its people demand better public services therefore, economic progress results in an increase in government expenditure. The casual relationship between the size of government and economic progress may reverse as many of the studies (Halicioğlu, 2003; Ziramba, 2008) have failed to find the validity of Wager's law in recent times (Wu & Lin, 2012).

The growth effect of government expenditure and revenue has been tested on rich countries for the time span of 1970–1995 (Fölster, & Henrekson, 2010). They found that government size is negatively associated with economic growth. Moreover, countries having bigger government sizes faced low total productivity growth for 19 OECD economies from the time period 1971–1999 (Dar & AmirKhalkhali, 2002). Furthermore, the small size of government proves to be more efficient and leads to lower policy-induced distortion, more market discipline, and less crowding out effect.

The size of the government is also affected by the public debt as it is allocated in the public budget. According to Alesina and Tabellini (1990), public debt is a part of the government budget (Mahdavi, 2004; Asadullah, 2017; Asadullah et al., 2020) found that external debt plays a significant role in the government budget and it does impact the structure of government debt by increasing the part of government debt while weakening other sectors. While the population size is imperative for the government budget, it is seen that the government expenditure on health, social security, education, and defense is closely related to the demographic arrangement of any country (Remmer, 2004). The effect of cyclical factors (tax base revenue and non-tax revenue) can be captured by the relative government size (Mahdavi, 2004). The government size is also related to the factors which may affect the composition of total expenditure like corruption level, trade shocks, social conflicts, and political instability (Ukwueze, 2015).

The association of trade openness and government size was developed by Cameron (1978). With the sample of 18 OECD countries, he demonstrated that trade openness was an active predictor of government size growth. Moreover, his study postulated that open economies were relatively more syndicated with respect to collective bargaining

which leads to an increase in demand for public transfers. The relationship between income and all measures of government expenditure for all income levels was extended (Rodrik, 1998). He added that collective bargaining which was proposed by Cameron (1978) is implausible to describe the correlation in a large sample of economies. It is due to the relative frailty of organized labor in emerging economies. He also deliberates that government size also serves as a shield against international risk.

The big economies have smaller government expenditure as a share of GDP (Alesina & Wacziarg, 1998; Uddin et al., 2021a, 2021b). They exhibited two arguments; first, the cost of provision can be low per capita by distributing non-rival public goods to a greater population; secondly greater populace tends to exhibit larger heterogeneity in predilections over good public endowment. The tradeoff between costs leads to greater heterogeneous preferences, and the benefits of the non-rival distribution of public goods exhibited the country size equilibrium. They demon-strated that less per capita expenses on public goods are exhibited by the big economies. At the same time, small economies are more trade liberalized as these economies take advantage of spillovers due to external production. These results are also supported by (Alesina & Wacziarg, 1998) where the negative relationship between government expenditure and population has been reported, explaining that big economies spend less on public goods but the estimation was stable after incorporating transfers and interest rate, explaining that population has no relationship with per capita transfers.

Government size and spending may differ when we compare developing and developed economies. Shelton (2007) concludes that government size affects different in developed and developing economies. The report highlights that government capital revenue leads to an increase in growth in developed countries, whereas seigniorage negatively affects growth in developing economies. The report also highlights that foreign aid is a harmful element in a developing economy's growth; this is owing to the fact to how foreign debt repayments have a high opportunity cost as those payments could be used by the governments to build infrastructure. The report also emphasizes corruption, which negatively affects government size and decreases institutional quality. Wu and Lin (2012) used data from 28 developing economies to find out that per capita GDP growth is reliant upon the growth of many factors, which include per capita public health expenditure in the GDP, public spending on education in the GDP, population, the share of total health expenditure in the GDP and the share of gross capital formation in the GDP. These factors inform us of the importance of the health and education sectors and their relation to government size and affirm the decision of analyzing these factors in this report.

Afonso and Furceri (2008) analysed how the size and volatility of government revenue spending affect economic growth. The report focused on developed economies of the EU and OECD and found out that components of fiscal policy, which include indirect taxes, social contributions, government consumption, subsidies, and government investment, have a large, negative effect on growth. The same author, Afonso and Jalles (2011), analyzed how government size affects economic performance as a whole. The report used different proxies for government size and institutional quality and concluded that government size and growth are indirectly proportional. The report also sheds light on how institutional quality positively affects real growth. The report also emphasized the extent of the impact of institutional quality, it found out that the smaller the government size, the greater the positive effect of institutional quality on real growth.

3. Data and Methodology

3.1. Data Sources

A panel dataset of 182 open economies with yearly observations for the period 1996–2016 is collected from the World Bank database (see Appendix 2). GE is defined as the General government's final consumption expenditure. Health expenditure is represented by HE. Government expenditure on education is denoted by EDUEXP. The economic volatility is measured by the rolling standard deviation of the GDP per capita growth rate. POP is Population growth, TO is Trade openness, GINI represents the Gini index which measures the degree to which the income distributed or consumption expenses among citizens deviate from a perfectly equal distribution. Thus, a Gini index of 0 denotes perfect equality, whereas an index of 100 infers perfect inequality. Other control variables are External debt (Extdebt), Domestic credit (DOMDEBT), Foreign direct investment (FDI), Inflation (INF), a real effective exchange rate (RER), and Real interest rate (RIR), and Tax revenue (TR). The institutional quality (IQ) indicators are Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC) collected from Governance indicator of World Bank database. The paper also uses the average of all indicators of ICRG as a proxy of the quality of institutions.

3.2. Methodology

The paper uses a Panel dataset of 182 countries. The characteristic of panel data is that it allows control variables that would not be observed or measured. For instance, cultural factors or those variables which change over time and do not change across entities like national policies and

international agreements. After applying Pool OLS, the paper also applies two famous techniques of panel data, i.e. Fixed effect and Random effect.

Fixed effect analyses the impact of variables that vary over time; it investigates the link between predictor and outcome variables within an individual like country, person, company, etc., as individuals have their characteristics which may or may not affect the predictor variable. The paper assumes that it can assess the net effect of the predictors on outcome variables because the fixed effect removes the effect of time-invariant characteristics. Another assumption of fixed effect is that time-invariant characteristics should not correlate with other individual characteristics. Individual error terms should not have correlated with others. The fixed effect is not appropriate if the error term is correlated; this is the main reason for the Hausman test. The estimated coefficients are not biased due to the absence of time-invariant characteristics. However, the random effect model is different from the fixed effect here; variation across individuals exists, and it does not correlate with the independent variables or predictor. The advantage of using random effect is that it considers time-invariant variables whereas, in fixed-effect, such variables are captured by the intercept. The paper uses the following model for estimation of the government size and its component:

$$GE_{it} = \propto_{it} + SDG \propto_{1it} + IQ \propto_{2it} + POP \propto_{3it} + e_t \quad (1)$$

$$HE_{it} = \propto_{it} + SDG \propto_{1it} + IQ \propto_{2it} + POP \propto_{3it} + e_t \quad (2)$$

$$EDUEXP_{it} = \propto_{it} + SDG \propto_{1it} + IQ \propto_{2it} + POP \propto_{3it} + e_t \quad (3)$$

4. Empirical Results

The results of economic volatility, institutional qualities, and government size are stated in Table 1. The results of pooled OLS show that most of the variables are significant; similarly, other methods of panel dataset have also been tested, and the result slightly differs. The tax revenue is statistically significant in each of the methods applied, which reflects that the size of the government income closely and positively affects the government size (2015); tax revenue/income is considered as government revenue which should not be regarded as a constraining and an entirely endogenous explanatory variable in government size model (Fielding, 1997). The economic growth volatility is positively associated with government size and implies that the increase in national income volatility will also increase the government size. Besides, external debt is another reason for increasing government size (Ukwueze, 2015); excessive debt makes economies less creditworthy (Fielding, 1997). The coefficient of trade openness reveals that the government size does not increase with trade openness.

Table 1: Estimation of Economic Volatility, Institutional Quality on Government Size

Variables	Pooled	Fixed Effect	Random Effect
SDGDP	6.8712*	4.4412*	4.4912*
	(2.83)	(2.99)	(3.00)
POP	0.05367**	0.0145*	0.0118*
	(2.25)	(2.71)	(2.62)
TO	0.02370	0.0069	0.0071
	(0.47)	(1.24)	(1.31)
GINI	−0.0108	0.1183*	0.1085*
	(0.56)	(5.81)	(5.46)
EXDEBT	1.0711*	3.5412**	3.7912**
	(4.02)	(2.02)	(2.14)
DOMDEBT	−0.0254*	0.0035	0.0006
	(5.06)	(0.57)	(0.11)
FDI	−0.9311**	−3.4512	−3.8412
	(3.02)	(0.43)	(0.48)
INF	−0.0247*	−0.0309*	−0.0308*
	(3.69)	(8.29)	(8.16)
RER	0.0125**	0.0307*	0.0305*
	(2.04)	(8.20)	(8.10)
RIR	0.0315*	−0.0118**	−0.0098
	(3.34)	(1.86)	(1.54)
TR	0.5213*	0.1983*	0.2176*
	(18.93)	(8.75)	(9.71)
CC	2.856*	0.5341	0.5793
	(4.25)	(1.00)	(1.11)
GE	1.335**	1.848*	1.778**
	(2.01)	(3.09)	(3.03)
PS	−1.688*	0.0901	0.0397
	(5.45)	(0.34)	(0.15)
RQ	−2.152*	0.6183	0.4754
	(3.79)	(1.16)	(0.91)
RL	0.4551	−2.477*	−2.252*
	(0.52)	(3.83)	(3.50)
VA	0.6048***	1.1275*	1.0444**
	(1.70)	(2.37)	(2.34)
CONS	6.786*	1.8926	2.4058
	(4.81)	(1.36)	(1.62)
Observation	720	720	720
R-square	0.49	0.72	0.52
Hausman Prob		0.000	

Note: *, ** and *** represents 1%, 5% and 10% level of significance, and () includes *t* and *z* statistics.

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The population growth also increases government size due to the packages of services offered by the government to each citizen; the packages of services include security, education, health, and institutional correction. The packages also include the right to use parks, highways, libraries, and many others (Spangler, 1963). According to the result, it was found that the estimation of the equation suggests that inflation has a significant effect on the government size and is positively related, which reflects that inflation is a source of big economic problems in emerging and least emerging countries, many other studies have been carried out to address the same issues (Choudhary & Parai, 1991; De Haan & Zelhorst, 1990; de Silva, 1977) (Alavirad, 2003; Asadullah et al., 2021a, 2021b, 2021c, 2021d; Sabri et al., 2022).

The paper also uses the proxies of institutional quality, among which government effectiveness and the rule of law are statistically significant. Government effectiveness has a positive result on the countries as a whole and their quality of life (Rainey, 2003). Not only this, but it also focuses on the fundamental administration, institutions, and the method of smooth service distribution (Gisselquist & Resnick, 2014; Alshammari et al., 2020). Moreover, the rule of law promotes the welfare of economies; however, it restricts the public authorities by refraining the government officials from naming particular, accountable individuals or groups for one or the other mischief or benefit (Ikeda, 2014).

Other than government size factors, the paper also finds the effect of economic volatility and institutional quality on government education and health expenditure in Table 2 and Table 3. The results propose that economic volatility, population growth, Gini coefficient, control of corruption, political stability, and the rule of law have a significant effect on health expenditure. Economic volatility is not the only factor that increases the government health expenditure, while other institutional quality indicators compositions are also part of the increase in government health expenditure. At the same time, the economic volatility, population growth, Gini coefficient, control of corruption, political stability, regulatory quality, the rule of law, and voice accountability have a significant effect on education expenditure.

5. Conclusion

For two decades, economic volatility has been one of the key factors which has drawn the attention of economists. The reason for economic fluctuations is mainly due to the financial crisis in past decades and how governments have tackled them. Therefore, this paper broadens the investigation by creating a link between economic volatility and government size. However, the importance of government was only known until the 1990s, when government participation had been increased in open economies. With respect to the many studies proposed, by restricting government intervention,

Table 2: Estimation of Economic Volatility, Institutional Quality on Health Expense

Variables	Pooled	Fixed Effect	Random Effect
SDGDP	3.2812*	7.7113*	1.0412*
	(10.67)	(3.06)	(4.03)
POP	–0.0903	0.02210*	0.01090*
	(1.63)	(10.43)	(7.05)
TO	–0.0582*	0.0244	0.0241
	(4.37)	(1.31)	(1.33)
GINI	–0.0048	0.0208*	–0.0253*
	(0.70)	(2.90)	(2.81)
CC	0.2136	–0.5947*	–0.6268*
	(1.01)	(3.05)	(3.27)
GE	–1.4766*	–0.6413*	–0.5827*
	(6.33)	(3.12)	(2.80)
PS	–0.2757*	–0.3536*	–0.4032*
	(2.52)	(3.40)	(3.82)
RQ	–0.8787*	–0.1229	–0.0404
	(3.91)	(0.63)	(0.20)
RL	2.2470*	1.0267*	1.2237*
	(7.22)	(4.17)	(4.93)
VA	1.4626*	–0.2488	0.1687
	(9.64)	(1.29)	(0.89)
CONS	8.0342*	4.2909*	5.2873*
	(18.09)	(9.18)	(10.34)
Observation	1242	1242	1242
R-square	0.42	0.53	0.39
Hausman Prob		0.0000	

Note: *, ** and *** represents 1%, 5% and 10% level of significance, and () includes *t* and *z* statistics.

economies acquire favorable economic progress. For this, the paper verifies that Wagner's Law exists in an open economy. The paper investigated the association of government size, economic volatility, and institutional qualities of 182 countries during the time period from 1996 to 2016. It also extends its research by incorporating government health and education expenditures determinants. One key finding is that the economic volatility of economies causes an increase in the government size in open economies. Secondly, the indexes of institutional quality suggest that government effectiveness and the rule of law affect the size of government. Third, the external debt contemporaneously affects the size of the government.

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Table 3: Estimation of Economic Volatility, Institutional Quality on Edu Exp

Variables	Pooled	Fixed Effect	Random Effect
SDGDP	6.2713*	3.4413	3.6613***
	(2.69)	(1.69)	(1.80)
POP	−0.0184*	0.0395**	0.01057
	(4.37)	(2.23)	(0.90)
TO	0.0425*	0.0233	0.0378**
	(4.06)	(1.43)	(2.49)
GINI	0.0108**	0.0506	0.0494
	(2.08)	(0.86)	(0.85)
CC	−0.3182**	−0.2755**	−0.2222
	(1.97)	(1.73)	(1.47)
GE	0.6538*	−0.3676**	−0.2163
	(3.67)	(2.19)	(1.31)
PS	−0.3138*	−0.3152*	−0.3385*
	(3.71)	(3.65)	(3.99)
RQ	−1.860*	−0.3811*	−0.4358*
	(10.80)	(2.39)	(2.77)
RL	1.0864*	0.5281**	0.7246*
	(4.59)	(2.62)	(3.69)
VA	0.8791*	0.0769	0.2822**
	(7.44)	(0.48)	(1.87)
CONS	1.727*	2.975*	2.914*
	(5.02)	(7.76)	(7.36)
Observation	1202	1202	1202
R-square	0.93	0.67	0.85
Hausman Prob		0.0009	

Note: *, ** and *** represents 1%, 5% and 10% level of significance, and () includes *t* and *z* statistics.

Furthermore, the results propose that economic volatility affects the government health and education expenditure, other than that, demographic factors, control of corruption, government effectiveness, political stability, and the rule of law have a significant effect on government health and education expenditures. There has been a pertinent policy implication drawn from the analysis, i.e. controlling economic volatility may reduce the size of government and also significantly affect health and education expenditures. Moreover, improving corruption may also assist in reducing the size of the government. Other indicators, which include efficient political stability, regulatory quality, and voice accountability, shrink the government size.
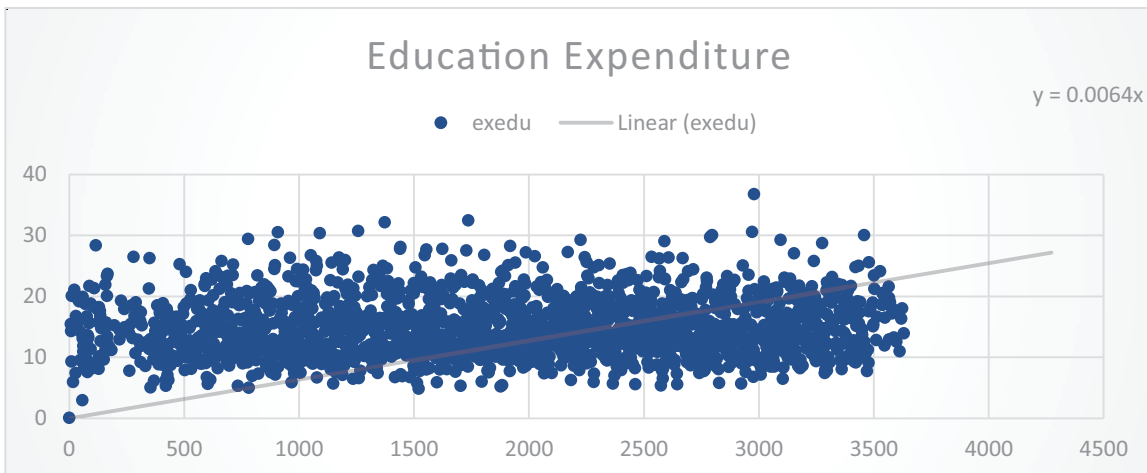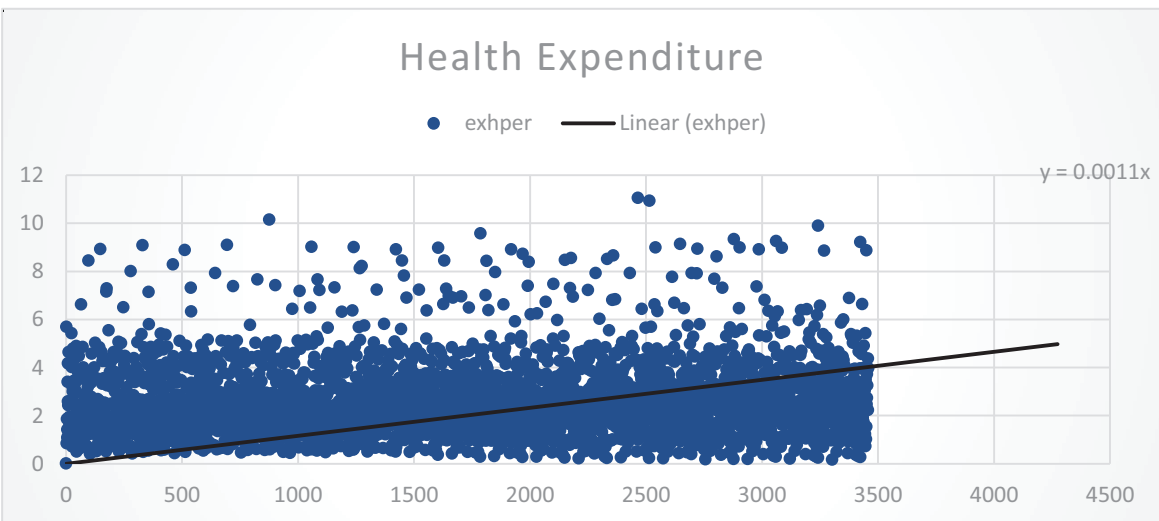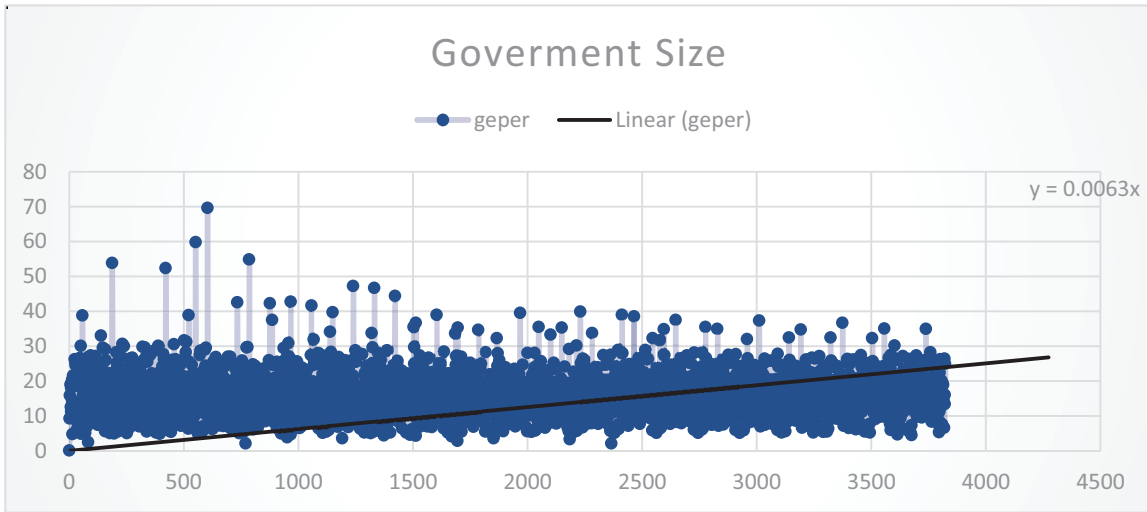
The above conclusions provide policymakers with a valuable source of direction as to which sector should their policies focus on. The significant effect of corruption and government effectiveness on government health and education expenditures speaks volumes about the need for institutional quality to be maintained for the effective development of health and education sectors. Finally, for future empirical research, this report recommends that one could study the different portions of government expenditure and how economic volatility affects each of these sectors.

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Appendix 1: Government Sizes

Goverment Size

y = 0.0063x

Health Expenditure

y = 0.0011x

Education Expenditure

y = 0.0064x

Appendix 2: List of Countries

Afghanistan	Chad	Guinea	Madagascar	Rwanda	Uzbekistan
Albania	Chile	Guinea-Bissau	Malawi	Samoa	Venezuela, RB
Algeria	China	Guyana	Malaysia	Sao Tome and Principe	Vietnam
Andorra	Colombia	Haiti	Maldives	Saudi Arabia	West Bank and Gaza
Angola	Comoros	Honduras	Mali	Senegal	Yemen, Rep.
Antigua and Barbuda	Congo, Dem. Rep.	Hong Kong SAR, China	Malta	Serbia	Zambia
Argentina	Congo, Rep.	Hungary	Mauritania	Seychelles	Zimbabwe
Armenia	Costa Rica	Iceland	Mauritius	Sierra Leone	
Australia	Cote d'Ivoire	India	Mexico	Singapore	
Austria	Croatia	Indonesia	Moldova	Slovak Republic	
Azerbaijan	Cuba	Iran, Islamic Rep.	Mongolia	Slovenia	
The Bahamas, The	Cyprus	Iraq	Morocco	Somalia	
Bahrain	Czech Republic	Ireland	Mozambique	South Africa	
Bangladesh	Denmark	Israel	Myanmar	Spain	
Barbados	Djibouti	Italy	Namibia	Sri Lanka	
Belarus	Dominica	Jamaica	Nepal	Sudan	
Belgium	Dominican Republic	Japan	Netherlands	Suriname	
Belize	Ecuador	Jordan	New Zealand	Swaziland	
Benin	Egypt, Arab Rep.	Kazakhstan	Nicaragua	Sweden	
Bermuda	El Salvador	Kenya	Niger	Switzerland	
Bhutan	Equatorial Guinea	Korea, Dem. People's Rep.	Nigeria	The Syrian Arab Republic	
Bolivia	Eritrea	Korea, Rep.	Norway	Tajikistan	
Bosnia and Herzegovina	Estonia	Kuwait	Oman	Tanzania	
Botswana	Ethiopia	Kyrgyz Republic	Pakistan	Thailand	
Brazil	Fiji	Lao PDR	Panama	Togo	
Brunei Darussalam	Finland	Latvia Papua New Guinea		Trinidad and Tobago	
Bulgaria	France	Lebanon	Paraguay	Tunisia	
Burkina Faso	Gabon	Lesotho	Peru	Turkey	
Burundi	The Gambia, The	Liberia	Philippines	Turkmenistan	
Cabo Verde	Georgia	Libya	Poland	Uganda	
Cambodia	Germany	Liechtenstein	Portugal	Ukraine	
Cameroon	Ghana	Lithuania	Puerto Rico	United Arab Emirates	
Canada	Greece	Luxembourg	Qatar	United Kingdom	
Cayman Islands	Grenada	Macao SAR, China	Romania	United States	
The central African Republic	Guatemala	Macedonia, FYR	Russian Federation	Uruguay	