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WOMEN IN PARLIAMENT AND PUBLIC HEALTH EXPENDITURE: EVIDENCE FROM SUB-SAHARAN AFRICAN COUNTRIES

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ABSTRACT

The linkages between women in politics and economic development have received significant attention from policymakers and researchers. There is a consensus in political economy literature that women are more sociable than men and that the higher number of females in parliament is associated with lower levels of corruption, better quality of environment and a higher level of economic growth. This paper investigates the effect of female representation on public health expenditure on a panel of 40 sub-Saharan African countries from 1995 to 2014. The empirical evidence is based on the ordinary least squares (OLS) method and the instrumental variables (IV-2SLS). The results show that a higher number of women in parliament increases the share of public spending devoted to health. Based on these results, several policy implications can be drawn.

Contribution/Originality: This study contributes to the existing literature by being one of the first empirical studies on the effect of political representation of women on public health expenditure in sub-Saharan Africa.

1. INTRODUCTION

The issue of gender inequality has become a global problem affecting both developing and developed countries. Inequalities between men and women are widespread in almost every aspect of a nation's life. Several initiatives have been implemented in recent decades aimed at integrating more women into the labor market. Perhaps one of the most important initiatives of the last decade is the adoption of the United Nations Sustainable Development Goals, which places gender equality and women's and girls' empowerment at the center of governmental concern. To better justify the need to integrate more women into the labor market, the McKinsey Global Institute (2015) estimated that the potential gains of women's integration in terms of annual GDP would be 28,000 billion dollars by 2025, representing 26% of the world's production. These estimates contrast with the reality of gender marginalization in almost every sector of a country's economic life, from education to economic independence.

Parliaments do not escape this general trend of gender inequality. According to the Inter-Parliamentary Union (2017), only 22% of parliamentary seats are held by women. This percentage shows how much of the world's parliaments are still dominated by men, and the consequence is the under-representation of women in key

management positions or in decisions-making bodies. Some developing countries, such as India, introduced a Bill in parliament in 1996 reserving one-third of the seats for women (Clots-Figueras, 2011).

Despite this desire, the implementation and effectiveness of these measures is slow. Africa, and more particularly sub-Saharan Africa, is experiencing a similar tendency to generalize gender inequalities. According to data from the (World Bank, 2015), and in relation to our sample, only seven countries (17.5%) (of which Rwanda ranks first with nearly 64% of women represented) have a female representation rate higher than 30%, while 15 countries (37.5%) have a female representation of under 15%.

A large number of empirical studies have examined the micro and macroeconomic effects of female representation using cross sectional, time series and panel data analysis. For example, the presence of women in politics has been shown to affect several dimensions of economic life, inter alia environmental quality (Mavisakalyan & Tarverdi, 2019), child health (Homan, 2017; Quamruzzaman & Lange, 2016), corruption (Debski, Jetter, Mösle, & Stadelmann, 2018; DiRienzo & Das, 2019), firm performance (Chen, Leung, & Evans, 2018), and economic growth (Jayasuriya & Burke, 2013). Additionally, as women's needs may be different from men's, a larger share of women in politics may be justified as a way to redirect policy implementation towards specific areas (Funk & Gathmann, 2010).

Despite their enormous importance and the active debate about the effect of female representation, the political economy literature has paid little attention to the relevance and importance of women in politics on public health expenditure, particularly in African countries. Although previous studies have not developed a formal theoretical framework to explain the relationship between women parliamentarians and public spending, the fact remains that the theory of gender socialization can serve as a theoretical foundation. According to this theory, gender differences in the environment, and hence social concerns, are attributable to the differential socialization experiences of boys and girls (Lv & Deng, 2019).

These disparities can be attributed to the differences in social values and expectations arising from socialization. Prudence and cooperation, which are relevant values that favor action for the most disadvantaged, are more prevalent among women than men (Beutel & Marini, 1995). As a result, Andreoni & Vesterlund (2001) revealed that the choices made by women in power may be more socially oriented than those made by men and they tend to legislate according to the environmental quality of citizens compared to industries. In other words, once women are in power, they have a tendency to legislate for social spending, such as health spending. Moreover, for Pande (2003), in democracies, the use of legislative policies to improve the conditions of the most disadvantaged depends on the behavior of the legislator. Pande (2003) concluded by stating that one of the major obstacles to the introduction of pro-poor, and therefore social policies, is the political under-representation of people belonging to marginalized groups, such as women who might vote for their own interests.

To the best of our knowledge, the effect of female representation on public health expenditure in Africa has not been analyzed to date. With the aim of filling this gap, this paper investigates the effect of female representation on public health expenditure in 40 sub-Saharan African countries from 1995 to 2014.

Understanding the relationship between females in politics and public health expenditure is important for at least two reasons. First, it can provide new explanations regarding the transmission channels for economic growth. Since public health expenditure constitutes an important determinant of economic growth (Rodríguez, 2018), any impact of female representation on public health expenditure can enhance economic growth. Second, understanding this relationship can enable policymakers to develop effective strategies for reducing corruption and increasing the efficiency of public health expenditure. Using several estimation strategies, results show that increased numbers of females in parliament will increase the share of public budgets devoted to the health sector.

The rest of this paper is organized as follows: Section 2 provides the related literature; Section 3 presents data and methodology; Section 4 presents the empirical results; and Section 5 concludes the study.

2. LITERATURE REVIEW

The inclusion of more women in politics now seems to be recognized as a necessity. According to advocates of the feminist cause, increasing the proportion of women represented in parliament will ensure better consideration of the needs of women (Clots-Figueras, 2011). For the latter, women, unlike men, are more inclined towards social actions and could therefore initiate laws in favor of women and the poor in general. As a result, initiatives reserving seats for women could therefore change the nature of political competition, thereby altering voter preferences and the quality of politicians (Baltrunaite, Bello, Casarico, & Profeta, 2014).

There is currently very little empirical research on the link between women's representation in parliament and public spending, particularly public health spending. The purpose of this literature review will be to review the few existing studies on the relationship between female politicians and public spending in general, and public health spending in particular.

Svaleryd (2009) studied whether the degree of women's representation in Swedish local councils affects local public expenditure patterns. Using elected representatives in 25 municipalities in 1980 and 28 municipalities in 1993, Svaleryd (2009) showed that increased representation of women in the local councils increased spending on childcare and education. In the case of the United States, Besley & Case (2003) found similar results. They showed that female parliamentarians are lobbying to increase family assistance spending and support increased child assistance. Funk & Gathmann (2014) used data on federal votes to show that the preferences of men and women for public goods are different. Moreover, they showed that gender significantly affects the composition of state spending and is more favorable for environmental expenditures than for agricultural and military expenditures. In the same vein, Rehavi (2007) showed that an increase in the number of female parliamentarians in the United States slightly increased health expenditure. Chattopadhyay & Duflo (2004) argued that the law guaranteeing third-party seats for women in India affects public policy decisions in a way that seems to reflect women's preferences for spending on improving roads and drinking water. Similarly, Clots-Figueras (2012) found that a higher proportion of female politicians increases the education levels of people in the affected districts.

Contrary to these studies, which show that female parliamentarians positively affect public policies, other studies produced contradictory results. For example, Funk & Gathmann (2014) used data on female mayors to show that gender has no effect on the size or composition of local public spending in the United States. In the case of Spain, and according to Campa (2011), the application of gender quotas on the election of female politicians has no effect on the composition of local government spending.

By the end of this literature review, two main observations had emerged. First, all works that exist are micro. No study has focused primarily on the influence of women in parliament on public spending at the macroeconomic level. Second, no study has addressed the cases of African countries. Our study contributes to this literature by focusing specifically on the effect of female parliamentarians on public health spending in sub-Saharan Africa.

3. METHODOLOGY AND DATA

The empirical approach was designed to estimate the effect of females in parliament on public health spending in sub-Saharan African countries. In this section, the data is described (section 3.2) and the estimation strategy is discussed (section 3.1).

3.1. Data

We examined a panel of 40 sub-Saharan African countries over the period from 1995 to 2014 with data from various sources. The choice of time period and countries was dictated by data availability. The size of the data varied from 600 to 800 observations across specifications due to missing observations for some countries. A complete list of countries as well as variables definitions and sources are provided in the Appendix.

The dependent variable is female representation, which is measured by the proportion of seats held by female members in single or lower chambers of national parliaments and is expressed as a percentage of all occupied seats. This variable was calculated using data obtained from the World Bank (World Development Indicators). Our independent variable is public expenditure on health care as a percentage of total health care expenditure (PHE) gathered from the World Health Organization (WHO).

In order to reduce biases from possible omissions of variables, and in line with the recent literature on public spending, seven control variables were taken into account: (i) per capita GDP, (ii) democracy (measured by Polity2), (iii) natural resource rents as a percentage of GDP, (iv) foreign aid (ODA), (v) voice and accountability (VA), (vi) trade openness, and (vii) internet. Table 1 presents the descriptive statistics of the variables used.

Table 1. Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Public health expenditure	797	44.963	17.105	3.091	94.567
Female representation	663	15.645	10.984	0.000	63.800
GDP per capita	789	6.987	1.063	5.139	9.920
Democracy (Polity2)	757	1.974	5.401	-9.000	10.000
Natural resources	794	13.729	13.602	0.001	80.632
Foreign aid (ODA)	789	10.318	10.344	-0.260	92.141
Voice and accountability	640	0.485	0.819	-1.859	1.007
Trade openness	742	4.169	0.463	2.693	5.741
Internet	759	4.047	8.258	0.000	51.255

3.2. Methodology

3.2.1. OLS estimation

To investigate the baseline effect of female representation on public health expenditure, we first of all estimate the following model:

$$\mathrm{PHE}_{i,t} = \alpha + \beta_1 PHE_{i,t-1} + \beta_2 \mathrm{Female}_{i,t} + \beta_3 X_{i,t} + \varepsilon_{it}$$

Where $\mathrm{PHE}_{i,t}$ is public health expenditure for country i in period t. $\mathrm{Female}_{i,t}$ is the proportion of females in parliament, $X_{i,t}$ is a vector which includes control variables, and ε_{it} is the error term.

When all classical assumptions are verified, the ordinary least squares (OLS) method remains the most appropriate for estimating Equation 1. Thus, we began our analyses by estimating Equation 1 using the OLS method. However, in practice, assumptions such as the normality of the distribution of errors are rarely verified, which may call into question the results obtained by the OLS. Moreover, the possibility of an inverse causal relationship and endogeneity leads us to explore other alternatives and more robust methods than OLS. Thus, in this paper, we use the instrumental variables method to control the problem of endogeneity.

3.2.2. Instrumental Strategy

As discussed above, when the OLS technique is used to estimate Equation 1, the estimated coefficients are inconsistent and likely to be biased because some of the independent variables in the model, such as GDP per capita, may be correlated with public health expenditure. This correlation raised the problem of endogeneity and the possible feedback effect from public health spending to income. To deal with possible endogeneity, we estimated Equation 1 using a two-stage least squares (2SLS) instrumental variable approach (IV-2SLS).

We have chosen an instrumental variable that is correlated with endogenous independent variables and is not correlated with error terms. We used the cumulative years since the granting of women's suffrage as instruments,

obtained from UN Women (2011). This instrument has been widely used in the literature on women's representation (Hicks, Hicks, & Maldonado, 2016; Mavisakalyan & Tarverdi, 2019). According to Hicks et al. (2016), when suffrage is granted earlier, more women will have been exposed to politics, either through direct participation or by observing previous generations of women in these roles. This experience could either directly encourage more women to play politics or facilitate their success in election victory, so that the current generation would see more women running for office.

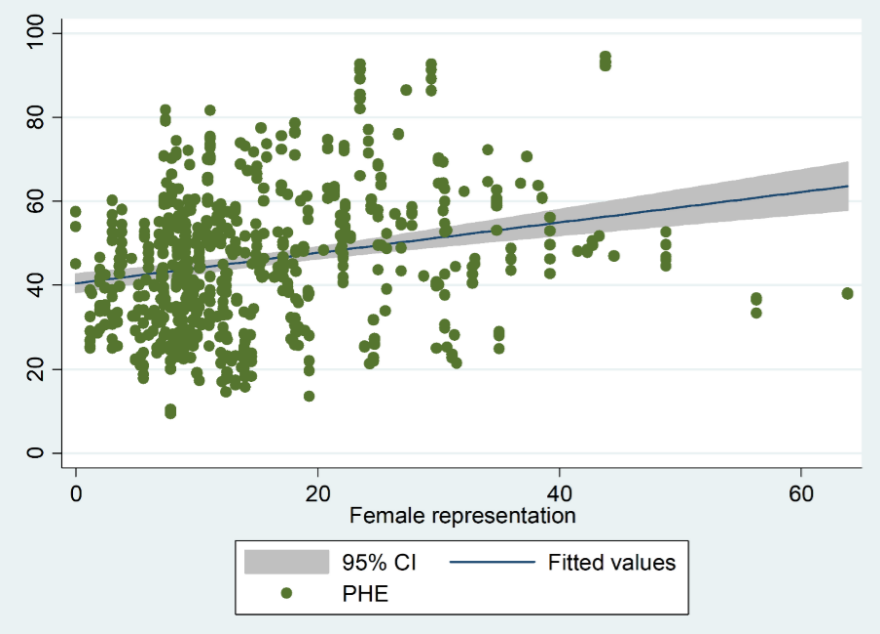

Figure 1. Female representation and public health expenditure (PHE).

4. EMPIRICAL RESULTS

4.1. Preliminary Results

Figure 1 provides a visual analysis of the relationship between female representation and public health expenditure (PHE) and gives an overview of the correlation between female representation and public health expenditure in all countries. Figure 1 supports the hypothesis that, overall, female representation is positively linked with PHE. However, since correlation does not mean causality, these correlations will be tested empirically in the next subsection.

4.2. Baseline Results (OLS)

The baseline results are presented in Table 2. Column (1) provides a bivariate regression specification in which females in parliament is used as the only determinant of public health expenditure, while columns (2–6) represent the robustness of the baseline model in column (1). Consistent with Figure 1, column (1) shows a strong positive effect of females in parliament on PHE. The coefficient associated with females in parliament is 0.258, suggesting that a 10-unit increase of females in parliament leads to an increase in PHE by 2.58 units. This result is consistent with Svaleryd (2009), who supports the view that increased representation of women in local councils increases spending on childcare and education. This conclusion suggests that if the number of females in parliament increases, particularly in African countries where this number is still very low, public spending in social sectors, such as health, will increase. In column (2), we control for the effects of GDP per capita. Taking GDP per capita into account does not change the effect of our variable of interest; the effect of women's representation remains positive and statistically significant at the 1% level. With regard to the GDP per capita variable, we find that its coefficient is positive and significant at the 1% level, meaning that countries with higher per capita income are

better able to allocate a significant share of wealth to health expenditure. This result corroborates that of Liang & Mirelman (2014), who found that rising income levels is among the key drivers of total spending on health. In column (3) we control for democracy and, once again, the effect of females in parliament on public health expenditure remained qualitatively and quantitatively the same. Additionally, the coefficient associated with the polity2 variable (democracy) is positive and statistically significant. This result clearly shows that democratic countries devote more resources to health spending. Theoretically, democracy is seen as a framework in which citizens are called upon to vote and express their preferences in terms of public policy (Profeta, Puglisi, & Scabrosetti, 2013). This result is in line with Careaga & Weingast (2012), who claim that higher levels of political competition results in polices with lower levels of corruption, greater provision of public goods and therefore higher levels of public health expenditure.

Table 2. Baseline model (OLS).

	Dependent variable: Public health expenditure					
	(1)	(2)	(3)	(4)	(5)	(6)
Female representation	0.258***	0.212***	0.183***	0.0766***	0.0933***	0.0622***
	(0.0261)	(0.0215)	(0.0212)	(0.0155)	(0.0157)	(0.0165)
GDP per capita		0.279***	0.234***	0.170***	0.176***	0.00743
		(0.0227)	(0.0219)	(0.0153)	(0.0134)	(0.0211)
Democracy (Polity2)			0.317***	0.225***	0.227***	0.214***
			(0.0388)	(0.0323)	(0.0298)	(0.0362)
Resource rents				-0.662***	-0.484***	-0.159**
				(0.0508)	(0.0470)	(0.0617)
Foreign aid (ODA)				0.0218***	0.0285***	0.0307***
				(0.00258)	(0.00231)	(0.00264)
Voice and accountability					0.112***	0.133***
					(0.0143)	(0.0191)
Trade openness					0.324***	0.00926***
					(0.0295)	(0.00314)
Internet						0.00208
						(0.00205)
Constant	5.176***	7.029***	7.839***	9.571***	8.630***	6.859***
	(0.0627)	(0.161)	(0.199)	(0.258)	(0.237)	(0.288)
Observations	663	659	620	620	497	491
Adjusted R-squared	0.0995	0.359	0.394	0.494	0.573	0.780

Note: Robust standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

In order to test the natural resource curse hypothesis, we introduced the natural resource of rent as a control variable in column (4). The sign of the coefficient of our variable of interest remains positive and statistically significant at the 1% level. On the other hand, the effect of natural resources on public health expenditure is negative and statistically significant at the 1% level, meaning that the resource curse hypothesis is verified in the case of public health spending. Such a paradoxical finding is justified by the fact that the governments of oil-rich countries are generally less inclined to invest in human capital and take effective action to improve health outcomes. This is consistent with Cockx & Francken (2014), who found a robust and significant inverse relationship between natural resource dependence and public health spending. There is a wealth of literature on the effectiveness of external assistance (see Morrissey (2015)). In column (4), we introduced foreign aid (ODA) as the control variable. The coefficient associated with females in parliament remains remarkably positive and significant, confirming the role of female parliamentarians in steering public spending towards social sectors such as health. When one looks at the ODA variable, its coefficient is positive and statistically significant. This result is consistent with the work of Mishra & Newhouse (2009), who showed that aid contributes to the reduction of child mortality, which itself requires an increase in public health expenditure.

In column (5), we control for institution quality with voice and accountability (VA) and openness by using trade openness. The effect of females in parliament on public health spending remains positive and statistically significant at the 1% level. Moreover, the coefficient associated with VA is positive and significant, suggesting that when institutions prompt governments to be accountable to the general citizen by promoting the participation of the poor in the political process, social spending will subsequently increase. This finding is in line with that of Habibi (1994) and Baqir (2002). With respect to democratic accountability, they showed that democratic societies tend to allocate a higher share of public budget to health. With regard to trade openness, its effect is positive and statistically significant. This result is consistent with the work of Novignon, Atakorah, & Djossou (2018), who showed that trade openness is good for the health sector. Although the work of Novignon et al. (2018) does not directly address the effects of trade openness on public health spending, they nonetheless demonstrate that trade openness reduces child mortality and under-five mortality and increases life expectancy at birth.

Finally, in column (6), we control for the effect of the information and communication technologies measured by the internet variable. Once again, the coefficient associated with female representation remains positive and statistically significant. The coefficient associated with the internet variable is positive but non-significant. To ensure the robustness of our results with regard to collinearity, we apply the inflation factor variance based on the results in column (6) of Table 3. The VIFs of the independent variables reported in Table 4 show no serious problem of collinearity. We observe that all variables are below the rule of thumb VIF value of 10 (Kennedy, 1992).

Table 3. Variance inflation factors: baseline regression.

	VIF	1/VIF
GDP per capita	2.88	0.347311
Female education	2.84	0.352633
Immunization for measles	1.87	0.535080
Natural resources	1.75	0.572257
Prevalence to HIV	1.63	0.614317
Public health expenditure	1.36	0.733517
Democracy (Polity2)	1.18	0.844005

Table 4. Female representation and public health spending (2SLS estimations).

	Dependent variable: Public health expenditure					
Female representation	0.213***	0.175***	0.150***	0.0610***	0.0746***	0.0377**
	(0.0221)	(0.0190)	(0.0189)	(0.0143)	(0.0141)	(0.0153)
GDP per capita		0.227***	0.186***	0.131***	0.140***	0.0251
		(0.0198)	(0.0192)	(0.0142)	(0.0121)	(0.0197)
Democracy (Polity2)			0.287***	0.211***	0.213***	0.140***
			(0.0341)	(0.0292)	(0.0274)	(0.0340)
Resource rents				-0.535***	-0.364***	-0.108**
				(0.0438)	(0.0400)	(0.0448)
Foreign aid (ODA)				0.0188***	0.0248***	0.0288***
				(0.00224)	(0.00184)	(0.00210)
Voice and accountability					0.106***	0.128***
					(0.0117)	(0.0146)
Trade openness					0.240***	0.00616**
					(0.0233)	(0.00266)
Internet						0.00271
						(0.00176)
Constant	4.634***	6.139***	6.872***	8.239***	7.356***	5.730***
	(0.0524)	(0.140)	(0.176)	(0.218)	(0.209)	(0.228)
Observations	564	563	530	530	468	462
Adjusted R-squared	0.0953	0.336	0.376	0.457	0.556	0.774

Note: Standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

4.3. Accounting for Endogeneity

The results provided by the OLS indicate a positive and significant effect of female parliamentarians on public health spending. However, the problem of unobserved heterogeneity may lead us to question these results. To try to solve this problem of unobserved heterogeneity, we use the method of instrumental variables and estimate our model by the two-stage least squares instrumental variable approach (IV-2SLS). We instrumentalize the representation of women through the electoral experience of women in society using the cumulative years since the granting of women's suffrage (Hicks et al., 2016; Mavisakalyan & Tarverdi, 2019).

Table 4 reports the IV-2SLS regression results of the effect of female representation on public health spending. All coefficients associated with female representation are positive and statistically significant at the conventional level. Overall, the results obtained using the instrumental variables method remain consistent with the analysis of the OLS model by suggesting that the higher the number of females in parliament, the higher the share of public spending devoted to the health sector will be.

On average, a 10-unit increase in female representation increases public health spending by 0.377–2.13 units. The control variables showed the expected signs. Table 4 shows that GDP per capita, democracy, foreign aid, voice and accountability, and trade openness have a positive effect on public health expenditure, while natural resource rents negatively affect public health expenditure. The effect of internet remains non-significant.

5. CONCLUSION

There is a plethora of empirical studies in the literature on political economy which examine the effect of female political representation on development. However, little attention has been paid, particularly in African countries, to the effect of female representation on public spending.

Moreover, there are no empirical macroeconomic studies that investigate how females in parliament affect public health expenditure in sub-Saharan African countries. This paper is an attempt to examine the role of female representation on public health expenditure in 40 sub-Saharan African countries during the 1995–2014 period. The empirical evidence is based on the ordinary least squares (OLS) method and the instrumental variables (IV-2SLS). Overall, the results show that an increased number of females in parliament increases the share of public spending devoted to the health sector.

The main recommendation stemming from this work would be to have a greater representation of women in the parliaments of sub-Saharan African countries. Such a measure would improve gender parity in the chambers of parliament. Indeed, in sub-Saharan Africa, only Rwanda and Senegal can boast a good enough representation of women in parliamentary bodies with 64% and 43%, respectively, of seats occupied by women.

Therefore, to implement such a measure, more attention should be given to the barriers that women face in accessing political responsibilities. On the one hand, it is a question of promoting better education for women by introducing incentives for their schooling. On the other hand, we suggest promoting policies to better empower women by promoting women's entrepreneurship and creating more equal access to the labor market.

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Appendix

Table-A1. List of countries.

Angola	Cote d'Ivoire	Madagascar	Sao Tome and Principe
Benin	Ethiopia	Malawi	Senegal
Botswana	Gabon	Mali	Seychelles
Burundi	Gambia, The	Mauritania	Sierra Leone
Cabo Verde	Ghana	Mauritius	South Africa
Cameroon	Guinea	Mozambique	Sudan
Chad	Guinea-Bissau	Namibia	Tanzania
Comoros	Kenya	Niger	Togo
Congo, Dem, Rep,	Lesotho	Nigeria	Uganda
Congo, Rep,	Liberia	Rwanda	Zambia

Table-A2. Definition of variables and data sources.

Variables	Definitions	Sources
Public health expenditure	Recurrent and capital spending from government budgets, external borrowings and grants and social health insurance funds	WHO (2015)
Female representation	Proportion of seats held by women in national parliaments (%).	WDI (2015)
Year since female suffrage	The cumulative years since the granting of women's suffrage	UN Women (2011)
GDP per capita	GDP per capita (constant 2010 US$).	WDI (2015)
Polity2	Democracy index.	Polity IV
Natural resource rents	Total natural resources rents (% of GDP). WDI (2015)	WDI (2015)
Foreign Aid	Net ODA received (% of GNI).	WDI (2015)
Voice and accountability	Perceptions of 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	WGI (2015)
Trade openness	Trade is the sum of exports and imports of goods and services WDI (2015) measured as a share of gross domestic product.	WDI (2015)
Internet	Individuals using the Internet (% of population) WDI (2015)	WDI (2015)