GOVERNANCE RETURNS TO EDUCATION: DO EXPECTED YEARS OF
SCHOOLING PREDICT QUALITY OF GOVERNANCE?

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ABSTRACT

This paper examines the relationship between expected years of schooling and

governance in a sample of 157 countries. Previous studies have looked at similar

relationships, specifically between education and democracy, and although researchers

have theorized a relationship between governance and education, little empirical work

has been undertaken. This study examines the relationship between the Human

Development Report variable "Expected Years of Schooling" and six Worldwide

Governance Indicators, which measure quality of governance internationally. To avoid

endogeneity and omitted variable bias, this study holds constant variables potentially

related to governance and controls for country and year fixed effects. The results of this

research suggest that expected years of schooling does not predict most governance

indicators, but does predicts Government Effectiveness, which measures the overall

quality of government programs. An important exception to this finding is in Sub-

Saharan Africa, where expected years of schooling significantly and substantively predict

Government Effectiveness as well as Regulatory Quality. This demonstrates that

education may be more important to good governance in Sub-Saharan Africa, a finding

with implications for international development policy. Efforts aimed at encouraging

good governance in Sub-Saharan Africa should focus both on governance itself, as well

as national capacity building.

Acknowledgements

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Introduction and Rationale

Does an increase in expected years of schooling predict the quality of a country's governance? In recent decades, international development organizations and donor governments have invested time and substantial money in improving governance – the quality and management of domestic institutions – in developing countries. In fact, according to Economist Dani Rodrik, in the early 2000s governance and improved institutions became part of a re-imagined "Augmented Washington Consensus," which added good governance to the list of largely economic elements that the World Bank and International Monetary Fund hoped to develop in partnering countries (2006). Other international non-governmental organizations, donors, and governments have also focused on improving institutions and governance in the last two decades, as democratization and economic reform in countries with weak institutions has been met with limited success. There is little evidence, however, of what actually predicts good governance. If certain variables such as education, Gross Domestic Product (GDP) per capita, level of democracy, or life expectancy predict the quality of governance in a country, it could affect the policy choices made by international development organizations such as the World Bank, donor countries, and national governments.

There are a number of reasons that influences on governance, specifically expected years of schooling's, are important to policies developed by governments and international development organizations. If governance is a function of education, investments in education may be effective at improving governance, and both governments and international donors should support education specifically as a means to grow good governance. Education, however, is also important to economic development

and perhaps even as an end unto itself: international development organizations and donor countries will likely emphasize education whether or not it predicts governance. The other, more important implication of this argument is that countries with low levels of expected years of schooling may be less likely to develop effective systems of governance. If this is the case, international development or donor organizations may choose not to invest in governance interventions until a country has reached a certain level of education, or they may choose strategic methods of targeting education and governance outcomes simultaneously. While general statements are difficult to make based solely on this paper, if a relationship between education and governance could be established, it would potentially influence the design and implementation of interventions aimed at improving governance.

Conceptual Framework and Hypothesis

This paper is unique in its direct examination of the relationship between expected years of schooling and composite measures of governance. Recognizing the potential importance of education to economic growth and democracy, researchers have studied education's effect on these outcomes. Surprisingly few studies, however, have looked directly at predictors of governance itself.

I focus on the relationship between the Human Development Report variable Expected Years of Schooling (at age 7)[1] and governance outcomes, as defined by the Worldwide Governance Indicators, using panel data from 157 countries between 1996 and 2010, and assess whether Expected Years of Schooling significantly predicts governance in the six Governance Indicators when using controls and fixed effects. I hypothesize that, all else equal; Expected Years of Schooling will predict quality of governance, operationalized through the Worldwide Governance Indicators.

Theory suggests there are two avenues through which education could improve governance. One element of this argument is that, per Glaeser, Ponzetto, and Shleifer's work on Democracy and Milligan et al.'s work on Governance, schooling increases the benefits of civic participation. If individuals are more engaged in their government, they will push for greater accountability and higher quality governance outcomes. They will use the democratic process or, indeed, any process available to improve their treatment by the government.

The other intuition underpinning this hypothesis is that the actual functioning of the government depends on the overall education level of society, because government is largely made up of individuals who have studied in its school system. Although elites in

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[1] Hereafter shortened to "Expected Years of Schooling," and capitalized to identify as a specific variable.

the central government may be outliers educationally, governments are made up of more than a few people. The overall quality and breadth of a country's school system will influence how government employees act in the central ministries, but also in rural offices, in government hospitals, police forces, militaries, and post offices. Essentially, these arguments state that by educating society, we increase the capacity of the people who run government, as well as the people who hold those government employees accountable.

The results of this research suggest that Expected Years of Schooling does not unambiguously predict governance internationally, and thus the hypothesis is not supported. However, there is an exception in the case of its relationship with Government Effectiveness in the full model, as well as in Regulatory Quality, upon which it shows effects in Sub-Saharan African countries.

Literature Review

Researchers have published methodologically similar studies to this work, but have mostly focused on the potential relationship between measures of education and democracy. Previous research by Glaeser, Ponzetto, and Shleifer points to a causal relationship between democracy and education, in which schooling encourages civic participation, which raises support for democratic regimes (2006). Some authors, however, including Acemoglu, et al., hold that this relationship is likely not causal. Despite high correlations between levels of education and democracy internationally, they find that there could be other factors driving democratization (2004).

One similar attempt to measure the relationship between education and democracy comes from Eleni London, an alumnus of the Georgetown Public Policy Institute. A master's thesis completed in 2011 by London analyzes the effect of compulsory education on democracy. Her question focuses specifically on national compulsory education policies and their relationship to measures of democracy. She finds that, surprisingly, compulsory education does not predict democracy; rather, when controlling for fixed effects, compulsory education is negatively associated with democracy (London 2011). London's work in some ways expresses the overall state of play in the discussion on influences on government outcomes. There seems to be an ambiguous relationship between education – and education policy – and governmental outcomes, which her work, as well as the debate between Acemoglu et al. and Glaeser, Ponzetto, and Shleifer, demonstrates.

Other theorists have proposed that governance, rather than democracy, may be influenced by education, specifically through the avenue of voting behavior. Milligan et

al. measure civic participation and voting as a function of education and suggest that this correlation could relate to the quality of democracy; if citizens are more educated, they may participate more readily in government and, through this participation, improve governance outcomes (2003)[2]. Recently, Rohini Pande has looked at various facets of this argument, and attempts to measure the importance of education and voter information to the behavior of voters and elected officials (2011). She finds that literature on education and political participation in low-income countries does not suggest a strong linkage, but that education may be a stronger predictor of political participation in higher income countries (Pande 2011).

Additionally, research by the World Bank has focused on governance as a *predictor* of education in the form of improved test scores (World Bank 2008). In each case, researchers have either used governance as a predictor of other outcomes, or have instead measured influences on governance through of voting behavior. This is not surprising, as there is no completely objective method to measure governance (or, for that matter, democracy). In this paper, the Worldwide Governance Indicators are used as a proxy to measure governance, with the understanding that a true measure of a construct such as governance will likely be difficult, if not impossible, to develop.

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[2] The authors noted that they could not think of a way to empirically measure the "quality of decisions made by the electorate," so instead chose to measure participation generally as a function of education (Milligan, Moretti, and Oreopoulos 2003).

Data Source

Worldwide Governance Indicators: To measure governance, I use the Worldwide

Governance Indicators, developed by Daniel Kaufmann, Aart Kraay, and Massimo

Mastruzzi. The Worldwide Governance Indicators are available for 211 countries from

1996 to 2010, and are produced every two years from 1996-2002 and annually thereafter.

The Governance Indicators are organized into six pillars: Control of Corruption,

Regulatory Quality, Political Stability and Lack of Violence, Rule of Law, Voice and

Accountability, and Government Effectiveness. These indicators encapsulate the

different elements of governance that developers Kaufmann, Kraay, and Mastruzzi judge

to be important in understanding effective governance (World Bank n.d.). For definitions

of each of the six indicators, see Appendix I.

The Worldwide Governance Indicators were developed using perception-based

methods. This involves compiling household and firm-level surveys, including publicly

available surveys such as the Gallup World Poll, World Economic Forum Global

Competitiveness Report, and input from commercial business information providers such

as Global Insight and Political Risk Services, NGOs such as Global Integrity and

Freedom House, and public sector, country-level research organizations (World Bank

n.d.). Because they are constructed, composite indicators, regressions utilizing the

Worldwide Governance Indicators should be interpreted with caution. Thus, in a range

between -2.5 and 2.5, increases or decreases of a few hundredths of a point might not be

practically meaningful. In this paper, I measure coefficients using standard deviations

from the mean rather than the raw numbers to aid in interpretation.

Expected Years of Schooling (age 7): My main explanatory variable is Expected Years of Schooling, which is developed by the United Nations Development Programme (UNDP) Human Development Report using the United Nations Educational, Scientific and Cultural Organization's (UNESCO) following formula:

> For a child of a certain age…the school life expectancy is calculated as the sum of the age specific enrolment rates for the levels of education specified. The part of the enrolment (*sic*) that is not distributed by age is divided by the school-age population for the level of education they are enrolled in, and multiplied by the duration of that level of education. The result is then added to the sum of the age-specific enrolment rates. (UNESCO n.d.)

While the primary relationship tested is between Expected Years of Schooling and the six Worldwide Governance Indicators, there are various other theoretical influences on governance. The primary control variables I use are the natural log of GDP per capita (Constant USD 2000), the Polity IV variable Polity, and the Human Development Report's Health Index.

Gross Domestic Product per capita (Constant USD 2000): Gross Domestic Product per capita is available in the World Bank Development Indicators for 209 countries from 1960-2010, and is developed using World Bank and OECD national accounts data (World Bank 2011). It is defined by the World Bank as "The value of all final goods and services produced in a country in one year (Soubbotina 2004)." This study uses Constant US Dollars 2000 so that GDPs per capita can be compared longitudinally.

Polity: The Polity IV Index measures democracy on the country level for 162 countries and, for some countries, goes back as far as 1800. Similar to the Worldwide Governance Indicators, Polity IV uses perception-based methods and historical data to determine a country's level of democracy and autocracy. The authors developed the Polity variable, which I use in this research, by subtracting a country's "Autocracy" score from its

"Democracy" score (Marshall, Gurr, and Jaggers 2010). As in the Worldwide Governance Indicators, Polity IV should be interpreted as a composite, perception-based indicator, and as such any conclusions drawn from its relationship with other variables should be interpreted with caution. Also, a country's level of democracy, and how this changes over time, is difficult to measure. As the authors state, "…general traits are only revealed, accurately, over the span of several years, so, initial Polity codings following a regime change are necessarily tentative (Marshall et al. 2010)." This is further cause for caution in interpreting results.

Health Index: The Health Index variable measures life expectancy as an index between 0 and 1, and is "expressed as an index using a minimum value of 20 years and observed maximum value over 1980-2010" (UNDP 2011). A life expectancy variable is included in this study because governance may be a result of investments in human capital, and two of the primary ways governments invest in human capital are through health and education. The Health Index, like Expected Years of Schooling, is published in the Human Development Report by the UNDP, and is available for 194 countries between 1980 and 2011[3] (UNDP 2011).

Sample Analyzed: This study uses 157 countries because the full, combined dataset, including control variables is not available for all countries. The sample used in this study is of governments worldwide. In the independent variables, the population is, theoretically, the population of each the countries represented. In the Worldwide Governance Indicators, however, we are looking at the performance of governments around the world. Thus, this paper, as in other research aimed at making cross-country

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[3] Both datasets are available for the years 1980, 1985, 1990, 1995, 2000, 2005, and then each subsequent year (UNDP 2011).

comparisons, attempts to get as close as possible to using the full number of governments worldwide. As will be discussed in more detail in the Considerations chapter, countries are missing from this dataset due to missing data, which could pose validity problems. I have also developed sub-samples of Sub-Saharan African countries, and of governments worldwide minus Sub-Saharan Africa and minus Former Soviet countries, which I use to test the robustness of the model.

<center>**Methodology**</center>

To measure the relationship between the Worldwide Governance Indicators and Expected Years of Schooling, I estimate a fixed effects model. The six Worldwide Governance Indicators are each used separately as dependent variables. The key explanatory variable is Expected Years of Schooling. Both variables are interval-ratio, as are the control variables GDP per capita, Polity, and the Health Index.

Because I am interested in the improvement or deterioration of governance and how it relates to the improvement or deterioration of Expected Years of Schooling, I use a model measuring each country's progress relative to its starting point. Thus, because each country has unobserved heterogeneity that will likely affect governance and education within the country, I control for country effects. Similarly, because there are likely regional or even global effects on education or governance in some years relative to other years, I include year effects in the model.

Initial model

$\text{Governance}_{it} = \beta_0 + \beta \text{ExpYrsSchool}_{it} + \varepsilon_{it}$

Second stage model

$\text{Governance}_{it} = \beta_0 + \beta \text{ExpYrsSchool}_{it} + \text{Democracy}_{it} + \text{GDPPerCapita}_{it} + \text{HealthIndex}_{it} + \Sigma_i \text{Country Fixed Effects}_i + \Sigma_t \text{Year Fixed Effects}_t + \varepsilon_{it}$

Where t = time and i = country

In determining the number of years to cover in this study, the most obvious constraint is the relative newness of the Worldwide Governance Indicators. Since the

<center>11</center>

data were not available prior to 1996, any research using these specific variables will necessarily begin in 1996 (World Bank n.d.). However, this time horizon has precedent in similar projects. In measuring social returns to education, Acemoglu and Angrist cover a period of 20 years and examine social and economic returns to education, measured in years of education and with dummy variables for how many years of school were required (1999). Angrist and Krueger use 10-year periods as "cohorts" when measuring returns to education (1991). Their estimates begin with individuals in their thirties, when returns to education had accumulated for approximately 10 years, which is similar to the time period used in this study. Expected Years of Schooling is based on current trends in average years of education and is comparable to these two precedents.

This data set includes the years 1996, 2000, and 2005-2010. Because different variables are available for different years (i.e. Expected Years of Schooling is available for 1995 and 2000, but not the intervening years, while GDP Per Capita is available for both 1995 and 2000 plus the intervening years), different variables have different numbers of observations. Since the Worldwide Governance Indicators begin in 1996, and because both the Expected Years of Schooling and Health Index variables are available for 1995 and 2000 but not the intervening years, I have coded the 1995 year for both Human Development Report variables as 1996. In some countries, this year may have seen increases in their Health Index and Expected Years of Schooling, which would introduce bias. To concentrate this bias, however, rather than spreading it across the data, I use existing data and code it as the same year rather than imputing data for the intervening years between 1995 and 2000 in the Human Development Report-derived data.

Descriptive Results

Table 1. Descriptive Results						
Variable	**Obs**	**Mean**	**Standard Deviation**	**Min**	**Max**	**Correlation with GDP Per Capita**
Expected Years of Education (age 7)	1283	11.63	3.4	2.2	18	0.62
Control of Corruption Estimate	1621	-0.15	0.99	-2.062	2.59	0.82
Rule of Law Estimate	1622	-0.2	0.99	-2.68	2.01	0.8
Voice and Accountability Estimate	1623	-0.19	0.98	-2.22	1.83	0.61
Government Effectiveness Estimate	1618	-0.11	0.99	-2.45	2.37	0.8
Regulatory Quality Estimate	1618	-0.11	0.98	-2.68	2.23	0.73
Political Stability and Lack of Violence Estimate	1615	-0.24	0.96	-3.3	1.66	0.56
GDP Per Capita (Constant 2000)	1566	$6128.22	9410.76	$61.58	$41,900.79	
Polity IV Polity Score	1606	0.25	17.18	-88	10	0.21
Health Index	1424	0.79	0.16	0.165	1[4]	0.59
Note: This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. Expected years of schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Worldwide Governance Indicators come from the Worldwide Governance Indicators dataset (World Bank n.d.).						

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[4] The raw number is 0.997, but in this paper my convention is to use two decimal places, so this number rounds to 1. However, no countries in this sample score either zero or one (UNDP 2011).

Regression Results

Table 2. OLS regression of Governance Indicators on Expected Years of Schooling						
Variable	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Regulatory Quality	Political Stability
Expected Years Schooling	0.19*** (0.0062)	0.2*** (0.0059)	0.18*** (0.0064)	0.21*** (0.0055)	0.2*** (0.0056)	0.17*** (0.0067)
Constant	-2.25	-2.36	-2.15	-2.59	-2.51	-2.028
Adj R^2	0.43	0.48	0.39	0.53	0.53	0.35
Obs	1280	1281	1282	1280	1280	1280
Mean	-0.15	-0.2	-0.19	-0.11	-0.11	-0.24
Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression does not include fixed effects. Expected years of schooling data come from the UNDP Human Development Report 2011 (UNDP 2011). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).						

Table 2 displays six OLS regressions in which each of the Worldwide

Governance Indicators is regressed on Expected Years of Schooling. In each case, the

coefficient is significant at the 1 percent level. All Governance Indicators are positively

associated with Expected Years of Schooling. In the case of Control of Corruption, an

extra year of school predicts an increase in Control of Corruption of 0.19 standard

deviations. An expected year of school predicts a 0.2 standard deviation increase in the

Rule of Law estimate. For Voice and Accountability this increase is 0.18 standard

deviations, for Government Effectiveness this increase is 0.21 standard deviations, for

Regulatory Quality this increase is 0.2 standard deviations, and for Political Stability and

Lack of Violence, this increase is 0.17 standard deviations.

Because of the positive coefficients, and high levels of significance, these

preliminary regressions seem to support the hypothesis that Expected Years of Schooling

predicts good governance outcomes. Because of the high likelihood of omitted variable

bias and endogeneity in a simple OLS model, however, I run fixed effects regressions

with appropriate controls, as seen in Table 3.

Table 3. Fixed effects regression of Governance Indicators on Expected Years of Schooling and controls (country and year fixed effects)						
Variable	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Regulatory Quality	Political Stability
Expected Years Schooling	0.025 (0.018)	0.012 (0.016	0.015 (0.017)	0.04** (0.017)	-0.0046 (0.018)	0.023 (0.028)
Log GDP Per Capita	0.16 (0.11)	0.19* (0.099)	-0.012 (0.087)	0.22* (0.12)	0.37*** (0.1)	0.52*** (0.11)
Polity	0.0025** (0.0012)	0.0026*** (0.001)	0.0049*** (0.001)	0.00004 (0.00099)	0.0021** (0.0009)	0.0057*** (0.0019)
Health Index	0.88 (0.77)	1.55** (0.64)	1.19 (0.73)	1.37*** (0.5)	1.02 (0.65)	2.01* (1.13)
Constant	-2	-2.51	-0.86	-2.98	-3.35	-5.44
R^2 Overall	0.58	0.62	0.41	0.68	0.64	0.4
Obs	1227	1228	1228	1227	1228	1229
Mean	-0.15	-0.2	-0.19	-0.11	-0.11	-0.24
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected years of schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).						

Table 3 displays the results of six fixed effects regressions, in which each of the

Worldwide Governance Indicators is regressed on Expected Years of Schooling, as well

as three controls. These controls include a natural log of GDP per capita, each country's

Polity score, and the Health Index. This regression includes both country and year

effects.

In the first regression, the Control of Corruption estimate is regressed on Expected Years of Schooling, the log of GDP per capita, the Polity score, and the Health Index. Of these, the Polity score is significant at the 5 percent level and indicates that an increase of one point in the Polity score predicts an increase of 0.0025 standard deviations in the Control of Corruption estimate. Previous research has shown mixed results as to whether more democratic countries tend to have lower corruption, however in this case there seems to be a relationship (Rock 2007). In this regression, the coefficient on Expected Years of Schooling is positive, as we would expect from the OLS model, but is not significant.

The second model regresses the Rule of Law estimate on these same variables. The Polity score is again significant, this time at the 1 percent level, indicating that an increase in the Polity score of one point predicts an increase in the Rule of Law estimate by 0.0026 standard deviations. The relationship between the log of GDP per capita and Rule of Law is significant at the 5 percent level, indicating that a one percent increase in GDP per capita predicts a 0.19 standard deviation increase in the Rule of Law estimate. The relationship between the Health Index and Rule of Law is also significant at the 5 percent level, indicating that a one-point increase in the Health Index predicts a 1.5 standard deviation increase in the Rule of Law estimate. Again, the coefficient on Expected Years of Schooling is positive, but not significant, a pattern seen throughout many of these models.

The third model regresses the Voice and Accountability estimate on the variables noted above. The only significant variable is the Polity score, which is significant at the 1 percent level, indicating that a one point Polity score increase predicts a 0.0049

standard deviation increase in the Voice and Accountability estimate. Insofar as Polity is a measure of democracy, and Voice and Accountability reflect elements inherent in free democracies, this result should not be surprising. With the exception of the log of GDP per capita, all relationships with Voice and Accountability are positive.

The fourth regression regresses the Government Effectiveness estimate on the variables noted above. This is the only regression in which the variable of interest, Expected Years of Schooling, is significant, in this case at the 5 percent level. This indicates that a one-year increase in Expected Years of Schooling predicts an approximately 0.04 standard deviation increase in the Government Effectiveness estimate. This makes intuitive sense in the case of Government Effectiveness: while high levels of education would likely help in controlling corruption or creating a stable government, they may be absolutely necessary to improve overall Government Effectiveness, which is defined by Kaufmann, Kraay, and Mastruzzi as:

> …perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (World Bank n.d.).

The log of GDP per capita is also weakly significant, at the 10 percent level, indicating that a one percent increase in the log of GDP per capita predicts a 0.22 standard deviation increase in the Government Effectiveness estimate. Finally, the Health Index score is significant, at the 1 percent level, indicating that a one point increase in the Health Index predicts a 1.37 standard deviation increase in the Government Effectiveness estimate.

When regressing Expected Years of Schooling on Regulatory Quality, with controls, the log of GDP per capita and Polity significantly predict the Regulatory Quality

estimate. The log of GDP per capita is positively associated with Regulatory Quality, at the 1 percent level, indicating that a one percent increase in GDP per capita is associated with a 0.37 standard deviation increase in the Regulatory Quality estimate. The Polity score also significantly predicts Regulatory Quality, at the 5 percent level, indicating that a one-point increase in the Polity score is associated with a 0.0021 standard deviation increase in the Regulatory Quality estimate. This is the only model in which Expected Years of Schooling has a negative relationship with a governance variable, although it is not significant. As will be noted below, directionality largely has to do with non Sub-Saharan African countries, in which this relationship is both negative and significant.

In the regression of the Political Stability and Lack of Violence estimate on the variables noted, the log of GDP per capita is significant at the 1 percent level, indicating that a one percent increase in GDP per capita predicts a 0.52 standard deviation increase in the Political Stability and Lack of Violence estimate. The Polity coefficient is also positive and significant at the 1 percent level, indicating that a one point increase in the Polity score predicts a 0.0057 standard deviation increase in the Political Stability and Lack of Violence estimate. Finally, the Health Index score coefficient is positive, and weakly significant at the 10 percent level, indicating that a one point increase in the Health Index score predicts a 2.01 standard deviation increase in the Political Stability and Lack of Violence estimate. As in all regressions other than the regression using Regulatory Quality, Expected Years of Schooling is positively associated with Political Stability and Lack of Violence, but in this case is the relationship is not significant.

The hypothesis of this paper is, in general, not supported by these findings, unless we choose to interpret coefficient direction as evidence of a relationship, which is not a

judgment supported by the data. One exception to this is in the regression on Government Effectiveness, where Expected Years of Schooling significantly and substantively predicts Government Effectiveness.

Throughout these models, Polity, GDP per capita, and the Health Index proved significant. In the case of Polity and GDP per capita, there may be omitted variable bias: essentially, what causes increases in democracy or GDP per capita may also cause improvements in governance. These are, however, strong relationships, and these results suggest that economic development and democratization in the absence of a strong education program may still result in good governance.

In the case of the Health Index, we find another positive, relevant result. If governments or donors choose to invest in human capital through health rather than, or in concert with education, this increases governance scores. Again, there may be omitted variable bias, in that the cause of increased life expectancies may improve governance through a different mechanism.

Robustness Checks

To test the robustness of these results and for possible phenomena driving them, I have performed robustness tests and models using different sub-samples. In the original fixed effects model (Table 3), countries are not weighted by population, and a country with a small population could influence the results equally to a country with a very large population. If we are interested in how Expected Years of Schooling affects governments around the world, this is an appropriate model. If we are interested in how this affects most people throughout the world who live under these governments, however, we should weight by population. The intuition here is that bad governance in a country like China, with a population of over one billion, will affect many more people than Burundi, with a population of just over eight million (World Bank 2011).

I re-run the regressions shown in Table 3 with countries weighted by population, and find similar results, but with two anomalies. As in Table 3, Expected Years of Schooling is significant, when regressed on Government Effectiveness, but in this case it is at the 1 percent level, indicating that a one year increase in Expected Years of Schooling predicts a 0.066 standard deviation increase in the Government Effectiveness estimate. This is an increase both in significance and effect: in Table 3, the significance level is 5 percent, and a one year increase in Expected Years of Schooling predicts a 0.04 standard deviation increase in the Government Effectiveness score. The other substantial change is that the coefficient of Expected Years of Schooling on Control of Corruption is strongly significant at the 1 percent level, suggesting that a one year increase in Expected Years of Schooling predicts a 0.046 standard deviation increase in the Control of Corruption estimate.

These effects vary somewhat from the model in Table 3, and indeed seem to heighten the effect of Expected Years of Schooling. This implies that countries with higher populations probably see bigger effects of Expected Years of Schooling on Governance. This further implies that, although Expected Years of Schooling has little effect on your average government, the average person in the world lives in a country where Expected Years of Schooling does influence Governance. Although this is an interesting result, it does not truly speak to the question we are asking, which is whether Expected Years of Schooling improves governance in national governments, no matter the population size. Generally national governments undertake governance, and countries have one central government regardless of size; therefore an un-weighted model is more appropriate for analysis. Including a model weighted by population lends nuance to the results, however: although governments internationally do not tend to see effects of Expected Years of Schooling on most governance indicators, countries with more people do seem to have more, and stronger, effects. See Appendix I for all models weighted by population.

As a further robustness check, I substitute the Human Development Report variable Combined Gross Enrollment – the national gross enrollment for primary and secondary school – for Expected Years of Schooling in each of the regressions displayed in Table 3 (UNDP 2011). The results indicate that substituting Combined Gross Enrollment changes the direction of association in two variables. The coefficient in the regression of Political Stability and Lack of Violence on Combined Gross Enrollment becomes negative, but remains insignificant, and the coefficient on Regulatory Quality becomes positive, and also remains insignificant. It also changes the significance levels

of two variables, by making the coefficient on Control of Corruption significant at the 5 percent level, and removing the significance of the coefficient on Government Effectiveness. Although this certainly questions the robustness of the Expected Years of Schooling variable, these changes in direction more likely reflect problems with the Combined Gross Enrollment variable itself, which is missing substantial data. Switching from Expected Years of Schooling to Combined Gross Enrollment drops the number of observations from between 1227-1229 to 681. The simple correlation between Combined Gross Enrollment and Expected Years of Schooling is 0.87, however, indicating a high correlation – so the two variables do seem to be highly related. In sum, this robustness check is paltry at best, due to the data missing from the Combined Gross Enrollment variable, and results should not be over-interpreted.[5] The full results of this robustness check can be found in Appendix II.

     We may be concerned that governance scores are caused by omitted variables, such as regional issues affecting groups of countries. In a 2004 paper, Acemoglu et al. note that democratic transitions in former Soviet countries were unrelated to domestic issues, such as education – rather; these changes were driven by the fall of the Soviet Union. It is possible that governance could improve because of a move to democracy or from international attention given to former Soviet states. Evidence of the importance of democracy can be seen in the overall fixed effect regression; highly significant positive coefficients on Polity indicate the importance of democracy to governance. There does not appear to be a strong correlation between Polity and the Governance Indicators,

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[5] This was one of the initial motivations for using Expected Years of Schooling in this paper rather than another measure. Enrollment data is incomplete for many countries and for many years from most sources, and thus is difficult to use in research attempting to study international trends. The threat that missing data may also be non-random produces further difficulties in using enrollment rate data.

however. All correlations between governance indicators and Polity are below 0.5. To test whether the relationship between Expected Years of Schooling and the Governance Indicators in former Soviet countries is different enough to skew the model, I run all regressions using a sample without former Soviet Union countries. All coefficients in this model are positive, including the relationship between Expected Years of Schooling and Regulatory Quality, which is negative in the full model. Government Effectiveness, the variable most associated with Expected Years of Schooling in the full model remained relatively unchanged, as its coefficient dropped by only 0.001 standard deviations and remained significant at the 5 percent level. This demonstrates that removing the former USSR from the sample has little effect on Expected Years of Schooling's association with governance. Governance may be slightly more associated with Expected Years of Schooling in the model without former Soviet states, as evidenced by the change in direction of the coefficient on Regulatory Quality, but the lack of significance in either the full model or this model make this difference in direction difficult to interpret. In general, these results are close enough to the full model to suggest that former Soviet states are not driving the full model's results. Refer to Appendix III for the model omitting former Soviet states.

If former Soviet countries seem more or less representative of the full sample, Sub-Saharan African countries are a distinct, idiosyncratic group in terms of the relationship between governance and education. Since they have substantially lower governance and education levels than much of the rest of the world (they also have the lowest life expectancies and GDPs per capita in the world – two of the three controls), Sub-Saharan Africa seems to follow a different pattern from the majority of countries in

this sample. And with 45 countries in the sample, Sub-Saharan Africa can influence the results of the full model enough to influence the relationship between governance and education.

To test the relationship between governance and education in Sub-Saharan Africa, I run two additional regressions: one omitting Sub-Saharan African countries and another using only those dropped Sub-Saharan African countries. Removing Sub-Saharan Africa from the sample removes the significance of Expected Years of Schooling on Government Effectiveness, indicating that Sub-Saharan Africa may in fact be driving this relationship in the overall model. In a sub-sample examining only Sub-Saharan Africa, Expected Years of Schooling predicts Government Effectiveness at the 5 percent level, as in the full sample, but with a larger coefficient and t-score. In the full model, the coefficient was 0.04, but in the sub-sample for Sub-Saharan Africa, it was 0.098, indicating that an additional year of school would predict a 0.098 standard deviation increase in the Government Effectiveness estimate. The t-score for Sub-Saharan Africa was also larger, at 2.43, compared to 2.35 in the full model.

In the model omitting Sub-Saharan African countries, the coefficient of Expected Years of Education on Regulatory Quality is negative and significant at the 10 percent level; in a dataset of just Sub-Saharan African countries, it is positive and significant at the 5 percent level. In the full model, the coefficient on Expected Years of Schooling, when regressed with Regulatory Quality, is negative, but not significant. Regulatory Quality, which is defined by the Worldwide Governance Indicators authors as measuring "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development," may be specifically

related to Expected Years of Schooling in regions where overall schooling is especially

low (World Bank n.d.). In many Sub-Saharan African countries, the formal private

sector is under-developed, so governments able to design and implement policies that

"promote private sector development," may be substantively different from countries that

cannot, and this difference may be related to schooling levels (International Finance

Corporation 1999).

Similarly to the regression on Government Effectiveness, this demonstrates both

the influence of Sub-Saharan Africa on the general model, and the difference in effects of

Expected Years of Schooling. For tables of both the model omitting Sub-Saharan African

countries, and the model with a sample solely of Sub-Saharan African countries, see

Appendix IV.

The lack of significance in the model that dropped Sub-Saharan African countries

and the high level of significance and larger coefficient in the model using the Sub-

Saharan African sample seem to indicate that Sub-Saharan African countries are driving

much of the effect of Expected Years of Schooling on Government Effectiveness. This

has implications both for governance efforts generally, and specifically in Sub-Saharan

Africa, where many development programs are focused. For a side-by-side comparison

of the full model of Expected Years of Schooling regressed on Government

Effectiveness, the model dropping Sub-Saharan African countries, and the model using a

sample of Sub-Saharan African countries, see Table 4, below.

Table 4. Comparison between Government Effectiveness models, focusing on Sub-Saharan Africa			
Variable	Government Effectiveness (full model)	Government Effectiveness (no Sub-Saharan Africa)	Government Effectiveness (Sub-Saharan Africa sample)
Expected Years of Schooling	0.04** (0.017)	0.025 (0.018)	0.098** (0.04)
Log GDP Per Capita	0.22* (0.12)	0.34*** (0.12)	0.11 (0.22)
Polity	0.00004 (0.00099)	-0.00067 (0.001)	0.0018 (0.0023)
Health Index	1.37*** (0.5)	-1.72 (1.14)	3.48*** (0.9)
Constant	-2.98	-1.37	-2.93
R^2 Overall	0.68	0.67	0.39
Obs	1227	869	358
Mean	-0.11	0.16	-0.79
Year Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected Years of Schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).			

Considerations

There are a number of limitations and threats to validity in this study, some of which can be ameliorated, and others that indicate a need for caution in interpreting results. In the case of educational enrollment, attainment, and other government-provided data, there is the potential for data errors, which could particularly bias the data used in Expected Years of Schooling. How this data is gathered may also differ based on the government collecting the data. In the case of both Governance Indicators and Polity IV, there is a risk of human error, bias, and lack of external validity. By their nature, human perceptions and opinions are not as accurate as a quantitative measurement. For qualitative measures, however, such as governance and democracy, indexing human perceptions is the most rigorous way to quantify data.

In a study such as this, which compares two interrelated variables, there is also potential for directional bias. Governance likely influences education, insofar as well-governed countries will have well-run school systems. We might worry, in a multiple regression model, whether there is directional bias, and perhaps if governance influences education rather than the other way around. However, by using controls and fixed effects, I parse out the effect of education and control for endogeneity.

One of the most serious threats to validity in this study is missing data, specifically, countries that have been eliminated from the study. More important than missing data is the risk that the missing data may not be random. If any of the data sets used in this study are missing countries due to other, related causes, this could introduce bias into the model. For example, if countries are missing from the model because of a lack of capacity to measure school enrollment, this is non-random and could introduce

bias. Although there is no definite way to ameliorate this risk, by randomly dropping

countries from the model, it is possible to attempt a weak replication of random missing

data. When randomly dropping five countries from the model, the only change was a

weakening of the significance level in the relationship between Expected Years of

Schooling and Government Effectiveness, which is to be expected when decreasing

sample size.

As noted, we must also exercise caution in interpreting Governance data, due to

its structure. This data is a composite indicator, so very small changes are not, according

to the authors, necessarily indicative of practical changes in governance across countries

(World Bank n.d.). In the case of this study, an additional year of schooling would

probably not make a difference because it is within the margin of error for most

countries. An increase of multiple years of schooling, however, might predict substantial

improvements in Government Effectiveness, as well as in Regulatory Quality in Sub-

Saharan Africa.

Conclusion

The main finding of this paper is that we cannot state with certainty that the variable Expected Years of Schooling predicts the majority of the Worldwide Governance Indicators, and thus cannot reject the null hypothesis in most cases. With the exception of the regression using the variable Government Effectiveness – and regressions using regional sub-samples – when controlling for GDP per capita, democracy, and the life expectancy, Expected Years of Schooling is relatively unimportant. Democracy, life expectancy, and GDP per capita do, however, seem to have substantial effects on governance.

Where we do see a strong effect of education is in Expected Years of Schooling's relationship with Government Effectiveness. As noted, this indicator is designed to describe both the overall quality of public initiatives, but also the "credibility of government's commitment to such policies," so it is logical that education might improve the overall effectiveness of the governments. Even this relationship, however, is complicated by regional dynamics (World Bank, n.d.).

In Sub-Saharan Africa, the relationship between Expected Years of Schooling and Government Effectiveness is so strong that it seems to be driving the significance of this relationship in the full model. Sub-Saharan Africa's strong effect on the full model can also be found in the relationship between Expected Years of Schooling and the variable Regulatory Quality. We see here how Sub-Saharan Africa is different from the rest of the world and how much more important education is to good governance in this region.

These differences may be due to regional dynamics that make Sub-Saharan Africa dissimilar from much of the world. One difference is that on average, Sub-Saharan

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African countries have many fewer Expected Years of Schooling than other regions. The mean of Expected Years of Schooling for non-Sub-Saharan countries in this sample (between 1995-2010) is 9.24 years, and for Sub-Saharan countries is 2.39 years. Essentially, if Sub-Saharan African students are expected to complete fewer years of school than other students, basic improvements in education in Africa may have stronger effects than in countries already meeting a certain educational baseline. A one-year increase in expected education in a country where most students do not complete primary school could mean substantially greater literacy and math ability – basic inputs for managing governments, but also for citizens to hold accountable their public servants. In a country where citizens are already literate, however, and most complete secondary school, the effect of one additional year of school may be weaker.

Policy Implications

These results are practically important to development, and especially important to social development in Sub-Saharan Africa. They are important because Sub-Saharan African countries often have low governance qualities, and because many of the international donor community's governance and institution-building programs are focused on Sub-Saharan Africa. As an evaluation of World Bank capacity building in Africa notes, "African countries must improve the performance of their public sectors if they are to achieve their stated goals of reducing poverty, accelerating economic growth, and providing better services to their citizens" (World Bank Operations Evaluation Department 2005). Other organizations such as the US National Democratic Institute, former UK Prime Minister Tony Blair's Africa Governance Initiative, and the United States Agency for International Development also specifically target governance in Sub-Saharan Africa.

If a certain baseline of education is a prerequisite (or is at least very helpful) for establishing Government Effectiveness and Regulatory Quality, this could help guide the work of governments, NGOs, and donors in Sub-Saharan Africa. International development organizations would be wise to focus their Sub-Saharan African governance efforts on capacity building, both in terms of explicit efforts to improve governance and also support for the national education system. On a broader level, this finding may lend support to efforts to increase the average number of years of school attained, such as the Millennium Development Goals' target of universal primary education (United Nations, n.d.).

The lack of a strong relationship between most Governance Indicators and schooling can be interpreted as positive news for governance initiatives internationally, in that governments and international organizations, in general, may not need to focus specifically on increasing national education before establishing good governance initiatives. Organizations, governments, and donors can invest in governance improvements even in the absence of high levels of educational attainment. The overall effectiveness of the government, however, will be improved by increases in years of schooling.

Another helpful policy implication comes from those variables that, all else equal, do predict governance. For example, if economic development programs can support good governance even without investing directly into capacity building or education, this could be an optimistic signal, and provide further support for economic growth efforts. The same may be true for health (operationalized in this paper in terms of the Health Index) and democracy. These are hopeful implications for organizations and governments undertaking development efforts, but should be studied in further depth.

Further research should also continue to disentangle regional dynamics, within Sub-Saharan Africa and in other regions. Although in this study I discuss some basic results from Sub-Saharan Africa, and in a sample without former Soviet nations, further work could discuss governance and education in the Middle East and North Africa, Southeast Asia, Latin America, and any other number of other regional groups. While this study gives an overview of how Expected Years of Schooling affects governance in aggregate, development is undertaken on the country or regional level, so more granular studies will likely be more directly applicable to development.

Insofar as the control variables used seem to predict governance better than the variable of interest, further studies should also discuss the relationship between democracy, GDP per capita, and/or health outcomes with governance. Studies could also use different measures for democracy, health, national income, and, if possible, governance to test how these results change when different measures are used. In general, because few studies have looked directly at predictions of the Worldwide Governance Indicators, there is much work to be done in determining predictors of these indicators.

Appendix I

Figure 1: Worldwide Governance Indicators Definitions, as defined by Kaufmann, Kraay, and Mastruzzi (World Bank n.d.)

Control of Corruption: "captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests."

Rule of Law: "captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence."

Voice and Accountability: "captures 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."

Government Effectiveness: "captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies."

Regulatory Quality: "captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development."

Political Stability and Lack of Violence: "measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism."

Appendix II

Variable	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Regulatory Quality	Political Stability
Table 5. Fixed effects regression of Governance Indicators on Expected Years of Schooling and controls, weighted by population (country and year fixed effects)						
Expected Years Schooling	0.046*** (0.015)	-0.012 (0.018)	0.026 (0.025)	0.066*** (0.015)	0.0087 (0.022)	0.055 (0.035)
Log GDP Per Capita	-0.18** (0.08)	0.11* (0.066)	-0.38*** (0.086)	0.43*** (0.057)	0.046 (0.1)	0.028 (0.12)
Polity	0.003** (0.0012)	0.0026*** (0.001)	0.0064*** (0.0014)	-0.0005 (0.0011)	0.0024* (0.0014)	0.0063*** (0.002)
Health Index	1.7*** (0.64)	0.41 (0.64)	2.54*** (0.84)	0.63 (0.51)	0.71 (0.72)	0.99 (1.43)
Constant	-0.75	-1.53	1.028	-4.46	-1.88	-0.52
R^2 Overall	0.97	0.98	0.98	0.98	0.97	0.92
Obs	1227	1228	1228	1227	1228	1229
Mean	-0.15	-0.2	-0.19	-0.11	-0.11	-0.24
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected Years of Schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011).   GDP per capita and world population data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.). All countries are weighted by population.

Table 6. Fixed effects regression of Governance Indicators on Combined Gross Enrollment and controls (country and year fixed effects)						
Variable	**Control of Corruption**	**Rule of Law**	**Voice and Accountability**	**Government Effectiveness**	**Regulatory Quality**	**Political Stability**
Combined Gross Enrollment	0.0048** (0.0021)	0.00044 (0.0016)	0.00046 (0.019)	0.0025 (0.0018)	0.0011 (0.002)	-0.0015 (0.0026)
Log GDP Per Capita	0.35** (0.15)	0.47*** (0.13)	0.016 (0.11)	0.39*** (0.12)	0.42*** (0.15)	0.85*** (0.17)
Polity	0.0033 (0.0031)	0.0055*** (0.0026)	0.0061*** (0.0021)	0.00064 (0.0013)	0.0029 (0.002)	0.009** (0.004)
Health Index	-1.02 (0.87)	1.31** (0.63)	0.032 (1.09)	1.35** (0.63)	0.37 (0.87)	1.72* (1.04)
Constant	-1.84	-4.27	0.45	-3.8	-3.29	-7.38
R^2 Overall	0.69	0.69	0.55	0.75	0.69	0.42
Obs	681	681	681	681	681	681
Mean	-0.15	-0.2	-0.19	-0.11	-0.11	-0.24
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Combined Gross Enrollment and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).						

Appendix IV

Table 7. Fixed effects regression of Governance Indicators on Expected Years of Schooling and controls on a sample without former Soviet Union nations (country and year fixed effects)						
Variable	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Regulatory Quality	Political Stability
Expected Years of Schooling	0.017 (0.018)	0.0087 (0.016)	0.015 (0.018)	0.039** (0.017)	0.0018 (0.018)	0.021 (0.029)
Log GDP Per Capita	0.066 (0.11)	0.096 (0.11)	0.02 (0.11)	0.15 (0.13)	0.31*** (0.11)	0.41*** (0.12)
Polity	0.0027** (0.0012)	0.0028*** (0.00096)	0.0048*** (0.0011)	0.00022 (0.00099)	0.0022** (0.00087)	0.006*** (0.002)
Health Index	0.96 (0.81)	1.58** (0.66)	1.14 (0.75)	1.4*** (0.51)	0.97 (0.67)	2.15* (1.16)
Constant	-1.19	-1.79	-1.006	-2.46	-2.92	-4.65
R^2 Overall	0.56	0.6	0.47	0.68	0.67	0.39
Obs	1109	1110	1110	1109	1110	1111
Mean	-0.094	-0.15	-0.15	-0.081	-0.082	-0.24
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected Years of Schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).

Appendix V

Table 8. Fixed effects regression of Governance Indicators on Expected Years of Schooling and controls on a sample without Sub-Saharan African countries (country and year fixed effects)						
Variable	**Control of Corruption**	**Rule of Law**	**Voice and Accountability**	**Government Effectiveness**	**Regulatory Quality**	**Political Stability**
Expected Years of Schooling	0.023 (0.025)	0.0019 (0.021)	-0.002 (0.02)	0.025 (0.018)	-0.044* (0.025)	0.042* (0.024)
Log GDP Per Capita	0.18 (0.15)	0.31*** (0.11)	0.017 (0.11)	0.34*** (0.12)	0.43*** (0.13)	0.74*** (0.13)
Polity	0.00075 (0.0014)	0.0022 (0.0019)	0.0033** (0.0013)	-0.00067 (0.001)	0.0014 (0.0013)	0.0032 (0.0033)
Health Index	-0.61 (1.36)	0.38 (1.27)	-0.5 (1.35)	-1.72 (1.14)	-2.53 (1.31)	0.2 (1.75)
Constant	-0.93	-2.44	0.57	-1.37	-0.57	-6.25
R² Overall	0.68	0.72	0.023	0.67	0.48	0.48
Obs	869	869	869	869	869	869
Mean	-0.051	0.031	-0.0072	0.16	0.14	-0.098
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected Years of Schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).						

Variable	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Regulatory Quality	Political Stability
Table 9. Fixed effects regression of Governance Indicators on Expected Years of Schooling and controls on a sample with only Sub-Saharan African countries (country and year fixed effects)						
Expected Years of Schooling	0.038 (0.048)	0.016 (0.037)	0.023 (0.037)	0.098** (0.04)	0.069** (0.034)	-0.051 (0.052)
Log GDP Per Capita	0.25 (0.25)	0.16 (0.24)	0.092 (0.23)	0.11 (0.22)	0.57*** (0.2)	0.36* (0.2)
Polity	0.0064** (0.0025)	0.004*** (0.0013)	0.0076*** (0.0018)	0.0018 (0.0023)	0.0035** (0.0017)	0.0077*** (0.0022)
Health Index	1.98 (1.44)	2.94 (0.99)	2.1* (1.14)	3.48*** (0.9)	2.66*** (0.85)	2.92*** (1.026)
Constant	-2.61	-2.44	-1.78	-2.93	-5.18	-3.24
R^2 Overall	0.33	0.44	0.3	0.39	0.31	0.31
Obs	358	359	359	358	359	359
Mean	-0.64	-0.76	-0.68	-0.79	-0.72	-0.61
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: Significance at 10% level is signified by *, 5% level is signified by **, and 1% level is signified by ***. Standard errors are reported under the independent variable coefficient, and are clustered at the country level. This data covers years between 1996-2010, but due to missing data for some variables, only the years 1996, 2000, and 2005-2010 are used. This regression includes fixed effects for country and year. Expected Years of Schooling and Health Index data come from the UNDP Human Development Report 2011 (UNDP 2011). GDP per capita data come from the World Bank Data Bank (World Bank 2011). Polity score data come from Polity IV (Marshall et al. 2010). Dependent variable data come from the Worldwide Governance Indicators (World Bank n.d.).

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