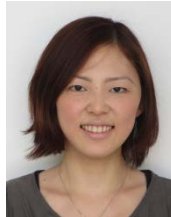# A Quantitative Analysis of the Effect of Governance on the Millennium Development Goals (MDGs): Implications for the Post-2015 Development Agenda

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Key messages:

- Few dispute that good governance is critical to achieving international development goals such as the Millennium Development Goals (MDGs). But difficulties identifying what makes governance good often leads the international development community to recommend governance reforms that countries either find easy to ignore or struggle to take forward.

- This paper employs a set of multivariate regression models to help prioritise governance reforms. The models shed light on whether and to what extent the World Bank's six governance indicators—voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption—were positively correlated with progress on the MDGs in 141 developing countries.

- The results indicate that "government effectiveness" and "rule of law" have substantively and statistically significant effects on progress countries made on the MDGs.

- They further suggest that measures of "voice and accountability" and "control of corruption" do not have the significant effects on performance on MDGs. In the case of "control of corruption," however, positive correlations with the "government effectiveness" and "rule of law" variables may be responsible for the somewhat surprisingly absence of a significant effect. These results should therefore be interpreted with caution.

- A third set of results include what are known as regional dummy variables. Models including these dummy variables suggest that countries in Asia and Latin America (perhaps due to regionally unique characteristics of their political or economic systems) score higher on MDG progress. They further imply that this might be due to higher levels of "government effectiveness" in Asia and Latin America than other regions.

- Based upon these results, the paper calls for the greater attention to how "government effectiveness" and "rule of law" can improve implementation of development policies during the post-2015 development agenda, bearing in mind differences between the MDGs and post-2015 agenda.

- It also underlines the need to look more carefully at the relationship between "control of corruption," "government effectiveness," and "rule of law" variables as well as to include alternative specifications to test similar hypotheses in future models.

- Qualitative case studies to better understanding the mechanisms linking multiple causes as well as causes and effects can also shed much needed light on why often assumed relationships between desirable properties of governance and indices of development do not hold.

1. Introduction

Over the past three decades, a growing number of stakeholders have maintained that good governance is the *sine qua non* of development. In fact, governance was viewed as being so pivotal to development that the 2000 United Nations Millennium Declaration that introduced the Millennium Development Goals (MDGs) included a separate governance-related goal titled a "Global Partnership on Development" (United Nations 2000). After the 2000 release of the MDGs, several other global initiatives highlighted the importance of good governance for not just development but sustainable development, including the outcome document of the 2012 Rio+20 Conference known as *The Future We Want*. Given these repeated references, it is perhaps unsurprising that governance has featured in discussions over a post-2015 set of development goals and newly proposed sustainable development goals (SDGs).

The extent to which governance actually strengthens implementation of development goals in these other international efforts will nonetheless require clearly delineating what makes governance good. Not only have international negotiations often extolled the virtues of governance, they frequently have left the details of what constitute good governance open to interpretation (Weiss, 2000; Doornbos, 2001). This tendency can make it easier for governments to ignore calls for improved governance. It can also overwhelm the capacities of developing to implement a lengthy list of even well intentioned governance reforms. To make the governance agenda more tractable, some authors have argued persuasively for "good enough governance" – a well-defined and manageable set of changes that can motivate politicians and enhance administrative capacities to pursue development goals (Grindle 2004, Grindle 2007). Others have highlighted common themes that run across international organization's proposals for improving governance in the future development

agenda, including "legitimacy, rights-based and access issues, as well as…well-functioning institutional frameworks to address crosscutting development issues" (Olsen and Elder, 2013). An important next step is clarifying to what extent key functional properties of governance have helped make progress on the most successful international goal setting efforts to date: the MDGs.

There is a significant amount of theoretical and empirical research which can contribute to analysis of the relationship between governance and the MDGs. Much of this work has looked at the relationship between a range of developmental outcomes and functional properties of governance such as control of corruption, democracy (or voice and accountability), rule of law and government effectiveness. Further, though much of this literature finds that less corruption, more democratic systems, stronger rule of law, and more effective public agencies are positively correlated with development outcomes, the size and the strength of these relationships remains a point of dispute. Moreover, while these differing views have been used to look at general development outcomes or specific sectors, they rarely address the performance of inherently cross-sectoral development outcomes such as one might capture by looking across several MDGs. Analysing the impact of different dimensions of governance on the performance of the MDG offers a potentially revealing window into what elements of governance mattered most for past—and possibly—future development goals.

This paper employs a set of multivariate regression models to test hypotheses on the possible impacts of functional properties of governance (captured by the World Bank governance indicators) on performance on the MDGs. Multivariate regression is an approach to analyzing the strength and size of relationships between a set of possible independent variables (in this case, the governance indicators) and a

selected dependent variable (in this case, progress on the MDGs). The results of the regression analysis suggests that "government effectiveness" – "the quality of public services, the quality of the civil service and its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to its stated policies" – has a substantively and statistically significant effect on performance on the MDGs. The results also suggests that "rule of law" – "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" – also has a statistically significant effect on performance on the MDGs (World Bank, 2014). However, the impact of government effectiveness diminishes (while that of rule of law stays more or less the same) when control variables are included in the models for an Asia and Latin America regional dummy variable; control variables are added to ensure that some of the effect attributed to the governance variables are not actually coming from other underlying causes such as the unique features of countries in a particular region. The finding that estimated coefficients on the regional dummy variables are significant while government effectiveness is not may reflect a positive correlation between the effectiveness variable and the Asia and Latin America dummy variables. Last but not least, several of the hypothesized relationships between "control of corruption" and "voice and accountability" run counter to many conventional arguments. In the case of "control of corruption," however, positive correlations with the "government effectiveness" and "rule of law" variables may be responsible for the somewhat surprising lack of a significant effect. These results should therefore be interpreted with caution, and more research will be needed teasing out substantive differences between these three variables.

The remainder of the paper is divided into five sections. First, the paper reviews existing literature to develop hypotheses on the impacts of dimensions of governance on the MDGs. Second, the paper discusses the variables and regression model. Third, the paper reviews regression results and discusses the effects of multicollinearity. Fourth and fifth, the paper reviews limitations and highlights implications for the Post-2015 Development Agenda and SDGs in a discussion of the way forward.

2. Theory and Hypotheses: Good Governance and Development

As noted at the outset, governance has become so central to development that it is often difficult to mention one without the other. Given this close link, it is perhaps unsurprising that governance has found its way into the most visible efforts to shape the development agenda in the past two decades: the MDGs. Introduced during a period when the international development community was looking to focus scarce resources on a well-defined set of development priorities, the MDGs have outperformed expectations in many respects. For example, the health MDG helped spur a decline in children dying worldwide before their fifth birthdays from 11.7 million in 1990 to 9.4 million in 2000 and 6.8 million in 2011 (McArthur, 2013). While there have been critiques over how governance was integrated and operationalized in the MDGs, there is less debate over whether governance affected the above health and other achievements (Vandemoortele and Delamonica, 2010).

Given the widespread belief in the importance of governance, there is also a strong chance that governance will find its way into negotiations over the successor to the MDGs: a post-2015 set of development goals and a new set of SDGs. In the most recent outcome document of the Open Working Group (OWG) on the SDGs, there are in fact two preambular references to good governance, a separate governance goal with 12 targets, and more than 50 enabling targets with some elements of governance incorporated therein (OWG, 2014). The recently published synthesis report of the United Nations Secretary-General entitled *The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet* mentions governance 12 times and includes two out of five sections on means of implementation with close parallels to governance (United Nations, 2014). While this paper welcomes the attention to governance, it is also mindful of literature that advocates a more cautious approach on the treatment of governance in international policymaking processes. Under the aptly named good-enough-governance argument, this more cautious line of reasoning holds that the international community should be careful when advocating for governance reforms lest it present countries lacking capacities with an "inflated" governance agenda (Grindle, 2004).

Fortunately, there has been a significant amount of literature on associations with important dimensions of governance and development that can make this agenda more concrete. Moreover, this literature has been aided greatly by the emergence of World Bank's Worldwide Governance Indicators (WGI). The WGI draws upon the informed views of policymakers, business people and representatives of civil society reported in 32 data sources to construct indicators for six functional properties of governance: 1) Voice and Accountability (VA), 2) Political Stability (PS), 3) Government Effectiveness (GE), 4) Regulatory Quality (RQ), 5) Rule of Law (RL), and 6) Control of Corruption (CC) (see Box 1). The article turns to some of the hypothesized relationships and different measures of development before testing them on measures of MDG performance.

2.1. Democracy and Development

The first WGI, Voice and Accountability (VA), has arguably been the area receiving the most attention in the governance literature. This attention typically looks more broadly at the relationship between democracy and various measures of development, ranging from health to education to wages to economic growth. While this development and democracy literature is voluminous (much of it covered under the heading of modernization theory; see Przeworski et al., 2000 for a review), given space constraints a few key strands are highlighted here.

Frequently cited studies suggest that democracy is good for development because it improves the welfare for the poor (Sen, 1981, 1999). Sen, for instance, suggests that democratic elections provide the poor opportunities to punish governments that fail to enable access to adequate food, shelter, and other essentials. Thus, in democratic systems politicians have incentives to strategically avoid policies that undermine or concentrate development in the hands of a privileged few (Sen, 1981). These claims are often supported by the literature that suggest democracies produce more public goods and redistribute income more evenly because they are forced by the electoral process to spend their revenues on government services, while autocratic government face no such referendum on their performance (Meltzer and Richard, 1981; Acemoglu and Robinson, 2006). Nazmul, for example, claims that democracies' spend more on education and health systems in developing countries because they are accountable to a voting public (Nazmul, 2006). Sen further argues that

democracies also allow for freedom of the press that enables the poor to keep informed on a government's potentially wayward policies (Sen, 1999).

Box 1: Worldwide Governance Indicators Definitions and Data

<u>Definitions</u>

1. **Voice and Accountability (VA)** – measured by 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.

2. **Political Stability and Absence of Violence/Terrorism (PV)** ‐ measured by perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically‐motivated violence and terrorism.

3. **Government Effectiveness (GE)** – measured by 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.

4. **Regulatory Quality (RQ) –** measured by perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

5. **Rule of Law (RL) –** measured by 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.

6. **Control of Corruption (CC)** – measured by 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.

<u>Data:</u> The WGI draw on four different types of source data:

- **Surveys of households and firms** (9 data sources including the Afrobarometer surveys, Gallup World Poll, and Global Competitiveness Report survey,

- **Commercial business information providers** (4 data sources including the Economist Intelligence Unit, Global Insight, Political Risk Services),

- **Non-governmental organizations** (11 data sources including Global Integrity, Freedom House, Reporters Without Borders), and

- **Public sector organizations** (8 data sources including the CPIA assessments of World Bank and regional development banks, the EBRD Transition Report, French Ministry of Finance Institutional Profiles Database)

Source: World Bank, http://info.worldbank.org/governance/wgi/

Two of the main features of democracies—and the ones that will be featured later in the paper—are accountability and transparency. As suggested above, more accountable and transparent political systems may create stronger incentives for decision-makers to pursue development goals, but recent studies have shown that these arguments do not always find empirical support (Brown and Mobarak, 2009). For some, the reason for the lacking support is that the relationship between development goals and democracies run in the opposite direction – wherein development increases the demand for democratization rather than the other way around. For instance, Mukherjee and Chakraborty found that development fuels demands for a responsive and transparent regime (Mukherjee and Chakraborty, 2013). Others are even less convinced that the relationship holds in general. For those subscribing to this more skeptical view, a frequently heard rejoinder is that democracy benefits higher income groups as the benefits of investing in social welfare accrue to politically active middle- and upper-income groups. Skeptics also assert that part of the reason for this inequality stems from the incomplete

2.2. Corruption and Development

A related debate involves the effect of corruption on development outcomes. Historically, there are two opposing views on this relationship. The first view stresses that corruption has a negative influence on economic growth (Mauro 1995), income inequality (Gupta et al. 1998), and development outcomes such as education and health (Dzhumsashev 2009). For example, in an analysis of subjective indices of corruption, red tape, judicial system efficiency, and various categories of political stability, Mauro finds that corruption (institutional inefficiency) lowers investment and thereby suppresses economic growth (Mauro, 1995). While this literature focuses on the effect of corruption on efficiency, Gupta et al. demonstrates that high and rising corruption increases income inequality and poverty by slowing economic growth, the progressivity of the tax system, the level and effectiveness of social spending, the formation of human capital, the unequal distribution of asset ownership, and unequal access to education (Gupta et al., 1998). Dzhumsashev similarly maintains that the direct effect of corruption on growth is statistically significant and that corruption creates significant inefficiencies in the public sector with implications for the education and health sectors (Dzhumsashev, 2009).

The second perspective on the relationship between corruption and development has a long history and takes a markedly different view. This perspective focuses on the possibility that corruption or the use of public funds for private means actually "greases the wheels" of change, improves government performance, and stimulates economic growth. For instance, Leff and Huntington claim that corruption might raise economic growth through two mechanisms: 1) "speed money" that helps individuals to avoid bureaucratic delay, and 2) "bribes" which motivates workers to work harder (Leff 1964; Huntington 1968).

A third group of recent studies take a more nuanced position in the corruption-growth debate, focusing chiefly on institutional channels through which corruption operates (Pellegrini and Gerlagh 2004; Everhart et al. 2009). Pellegrini and Gerlagh, one of the first empirical studies that attempted to examine the effect of corruption on different channels on economic growth, note that the influence of corruption appears to be statistically insignificant once controls are introduced in the model for relevant factors such as private investment (Pellegrini and Gerlagh 2004). Adding to this argument, Everhart et al. observe that the direct effect of corruption on economic growth measured in terms of per capita GDP is difficult to discern, while the indirect effect of corruption through private investment and quality of governance such as quality of bureaucracy and public investment appears more prominently (Everhart et al. 2009). Therefore, corruption may have both negative and/or positive effects on economic growth depending upon the causal mechanism and the operationalization of tests.

2.3. Government Effectiveness and Development

A third set of explanations relates to the impact of government effectiveness on development. By and large, there has been little debate that effective governments are better for development. More effective governments are known to offer stronger protections on property rights that encourage greater private investment (North, 1991). They are also known to offer higher quality public services, attract more investment, encourage more human capital accumulation, put foreign aid resources to better use, accelerate technological innovation,

and increase the productivity of government spending by creating political stability and efficient bureaucracies (Mauro, 1995: Gupta et al., 2002). In short, better quality governments usually have positive effect on development outcomes thanks to efficiency in the delivery of public services.

To the extent that contrasting views on the relationship exist, they tend to fall along two lines. One is that effective governments might not only be capable of introducing reforms promoting development but also reforms undermining development. This could include, for instance, backing state owned industries that crowd out the private sector and discourage foreign investment. A related contention is that effective governments might only be motivated to pursue development-friendly outcomes when they are compelled to do so by other dimensions of governance such as democratic elections and free press. Others suggest these additional motivating variables may be deeply embedded in the sociopolitical culture. La Porta et al., for instance, stress that government performance is determined not only by economic benefit of a country, but also by political and cultural factors. By assessing the correlation between per-capita income and government performance, they "find that ethnolinguistic heterogeneity and the use of a more interventionist legal system, such as socialist or French civil law, predict inferior government performance," which may, in turn, impair development (La Porta et al., 1999).

2.4. Rule of Law and Development

The fourth and final set of literature featured in the paper presents varying views on rule of law. Rule of law was conventionally seen as an enabler of economic development insofar as it protects property rights, guarantees fair and credible contract enforcement, supports the enforcement of labor laws, and provides checks on government and judicial independence. Rule of law is meant to curb government predation as a principal constraint on economic growth, once again underlining that sometimes holding back government is crucial for economic performance (Weber 1979; North 1991; Barros 1997). Discussing the reason that rule of law stimulates development, Weber and North emphasize that the legal system's protection of property rights and enforcement of contracts lowers the transaction costs involved in exchanges and allows resources to be transferred to those who can use them most productively (North, 1991). Similarly, Barro argues that formal institution—including democracy and bureaucratic quality—do not really affect growth, rather central institutional determinant of growth is adequate protection of property rights (Barro 1997).

Slightly different views stress the variant effects of rule of law among countries as particular countries' legal traditions are often rooted in a unique culture, history, politics, institutions and conceptions of justice (Berg and Desai 2013). Haggard, for example, suggests that the fundamental constraints on growth that often exist in developing countries are the inability to provide law and order in the most basic sense, which often results in the state failure and weak governments (Haggard 2011). Berkowitz et al. also shows that countries that have developed legal orders internally, adapted transplanted law, and/or had a population that was already familiar with basic principles of the transplanted law have more effective legality than countries that received foreign law without any similar predispositions. As such, the relative ease or difficulty of this transplanting process has a strong but indirect effect on economic development via its impact on legality (Berkowitz et al. 2000).

Table 1: Summary of literature review

Authors	Independent Variable	Dependent Variable	Summary
Sen A. 1981, 1999	Democracy	Politician's behavior	• Democracies provide for free elections and protections on press freedoms that hold politicians accountable for meeting basic needs and providing public goods.
Nazmul, 2006	Democracy	Education/Health systems	• Democracies have higher levels of accountability, leading to greater expenditures on education and health.
Brown and Mobarak, 2009	Democracy	Regime type	• Development increases the demand for democratisation rather than the other way around.
Ross, 2006	Democracy	Income levels/inequality	• Democracy benefits the wealthy, and the benefits of investing in social welfare accrue to more politically active wealthier groups. • The provision of incomplete information related to government policy and social polarization common in democracies creates greater inequality.
Mauro, 1995	Corruption	Economic growth	• Corruption (institutional inefficiency) reduces investment levels and slows economic growth.
Gupta et al., 1998	Corruption	Income inequality	• High levels of corruption increase the progressivity of the tax system, reduce the level and effectiveness of social spending, undermine the formation of human capital, and cause unequal distribution of asset ownership and access to education.
Dzhumsashev, 2009	Corruption	Education and health	• Corruption gives rise to significant inefficiencies in the public sector, which curtails spending on education and health.
Leff, 1964 and Huntington, 1968	Corruption	Economic growth	• Corruption might raise economic growth through two types of mechanisms: 1) "speed money" that enables individuals to avoid bureaucratic delay, and "bribes" which motivate workers to work harder.
Pellegrini and Gerlagh, 2004	Corruption	Economic growth	• The effect of corruption is statistically insignificant when controlling for private investment and other factors.
Everhart et al., 2009	Corruption	GDP per capita	• The direct effect of corruption on GDP per capita is difficult to see clearly; the indirect effect of corruption is more noticeable on private investment and the quality of governance, including quality of bureaucracy and public investment.
North 1991, Mauro 1995 and Gupta et al., 2002	Government effectiveness	Public services delivery	• Effective governments are better equipped to protect property and thereby encourage greater private investment. • Effective governments produce higher levels of political stability and more efficient bureaucracies. • More stable and efficient governments tend to be associated with many factors that enable growth such as f human capital accumulation and technological innovation.
Weber 1979, North 1991	Rule of law	Economic development	• The legal system's protection of property rights and enforcement of contracts lowers transaction costs; this eases exchange and allows resources to more productive investors
Barro 1997	Rule of law	Economic development	• Formal institutions, including democracy and bureaucratic quality, have a less significant effect on growth than adequate protection of property rights.
Haggard 2011	Rule of law	Economic development	• The rule of law not only places restraints on the capricious use of state power but limits the reach of the private sector into public affairs.

2.5.   Hypotheses

Based on the reviews summarized in Table 1 on the impact of varying dimensions of governance on development, the paper aims to test the hypotheses in Box 2. While the literature offers diverse views on the possible relationship between democracy (transparency and accountability), government effectiveness, corruption, and rule of law and development, as a first cut the papers posits these relationships will be positive. More specifically, it tests the hypotheses that higher the scores on the different government indicators, the more progress on the MDGs. Moreover, though not covered at length in the literature review, the paper also includes models that test the conventional wisdom that the two additional governance indicators for political stability and regulatory quality have positive impacts on development outcomes (in Model 1).

Box 2: List of Hypotheses

1. Countries with more voice and accountability will score higher on MDGs Progress Index.

2. Countries with greater government effectiveness will score higher on MDGs Progress Index.

3. Countries with stronger rule of law will score higher on MDGs Progress Index.

4. Countries that exercise greater control on corruption will score higher on MDGs Progress Index.

3. Model and Variable Description

To test the above hypotheses, the paper employs a set of multivariate regression models. The primary independent variables in the models are the six aforementioned governance variables taken from the World Bank's WGI. One model also includes controls for per capita GDP taken from the World Bank's World Development Indicators (for the years 2009 through 2013). In the second of the two models, regional dummy variables are included for Asia, Africa, and Latin America; this is done as some studies have shown geographical differences not easily captured in variables that cut across regions may influence development. This is also suggested in some of the governance arguments that refer to sociocultural conditioning factors (Gallup et al., 1998; Rodrick et al., 2014).

Table 2: List of Variables

Independent Variables	Dependent Variable	Control Variables
Six governance indicators (WGI) • **Voice and Accountability (VA)** • **Political Stability and Absence of Violence/Terrorism (PV)** • **Government Effectiveness (GE)** • **Regulatory Quality (RQ)** • **Rule of Law (RL)** • **Control of Corruption (CC)**	MDGs Progress Index	• GDP per capita • Dummy Variable for Regions (Asia, Africa, Latin America)

The dependent variable in all models is an MDG Progress Index (Center for Global Development, 2011). The MDG Progress Index use newly available data for 2009 and 2010, and outlines updated trends of how individual countries are faring against eight core MDG targets (extreme poverty, hunger, education, gender, child mortality, maternal mortality, HIV/AIDS, and water). The MDG Progress Index essentially scores countries on whether they are on track (1 point), made some progress (.5 points), or have not made progress (0 points). Deficiencies in the data continue to make tracking progress on the MDGs difficult and highly sensitive to missing data,

revisions, and retractions. The MDG Progress Index deals with these possibilities by reporting an overall and then an adjusted score. The adjusted index scores divide countries regular scores by the total number of indicators both with available baseline and recent data observations. This is done so as to avoid penalizing countries with missing data. The adjusted score is used in the models in this paper. Figure 1 is a frequency histogram for that adjusted progress variable; the histogram demonstrates that this variable follows a roughly normal distribution and is thus well suited for a regression analysis.
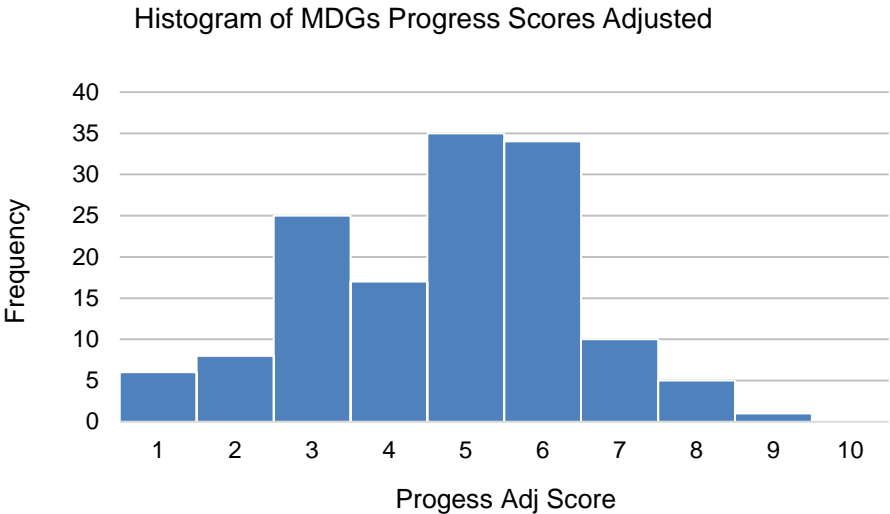
Histogram of MDGs Progress Scores Adjusted

Figure 1: A Frequency Histogram for the Adjusted MDGs Progress Scores

Both models use data from 141 developing countries as the data on MDGs progress is only available for these countries. When data are unavailable for some countries in the target year,

then alternative data was taken from closest past years from the same data sources. Table 3 presents basic descriptive statistics for the independent and dependent variables.

Table 3: Descriptive Statistics for the Independent and Dependent Variables

	Voice and Accountability	Political Stability and Violence	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	MDGs Progress Index
Mean	2.14	2.11	2.01	2.04	1.99	2.01	4.04
Median	2.17	2.15	1.97	2.06	1.97	1.95	4.5
Max.	3.69	3.86	3.69	3.98	3.75	3.93	8
Min.	0.42	−0.33	0.32	0.06	0.15	0.76	0
Standard Deviation	0.82	0.88	0.6	0.69	0.67	0.57	1.65

4. Summary of Findings

4.1. Regression Results

As the preceding section has discussed, the paper expects that there will be a positive relationship between each of the governance dimensions and the MDG progress variables. As demonstrated in model 1, this is only borne out for two of the dimensions of governance. Namely, government effectiveness and rule of law have positive effects on achievement of the MDGs. As illustrated in Table 4, government effectiveness has a positive and significant impact on progress with MDGs with a coefficient value of 1.15 and p-value just below the .10 significance threshold. In terms of magnitude of coefficients, the second largest effect comes from the rule of law with the estimate of 1.21 that is once again below the 0.05 significance level. Both of these effects appear to be not only statistically but substantively significant. For instance, if a country improved its government effectiveness by one standard deviation, this could have the equivalent effect of increasing their MDG progress score by nearly one point. This could be the difference between making no progress and being on track for achieving one of the MDGs. A similarly large effect appears to be associated with the rule of law variable.

The first and many of the other models also illustrates some rather surprising results. Most notably, in contrast to the hypotheses and much of the development literature, the control of corruption has a significant negative impact on the progress with MDGs with an estimate of – 1.46 and p-value < 0.05. Equally surprising, though not as large, the voice and accountability indicator for democracy also shows a negative effect with the estimate of – 0.52 and p-value < 0.10.

Another noteworthy set of results in models 1 involves the last two WGI indicator coefficients for stability and regulatory quality. The coefficients for both of these variables are not statistically discernable from zero. Last but not least, the GDP per capita is not statistically significant with a p-value > 0.10. Thus, GDP per capita does not seem to affect the correlation between the progress with MDGs and WGI. A brief review of the models in Table 4 follows in Table 5; additional discussion will follow on other models 2-5 in Table 4 in section 4 on multicollinearity.

Table 4: Regression Model Results

Model # \ Variables	1	2	3	4	5
Intercept	2.15*	2.71***	2.73***	2.64***	3.09**
	(0.97)	(0.48)	(0.50)	(0.00)	(.52)
Voice	-0.52	-0.50*	-0.024	-0.20	-0.68**
	(0.28)	(0.24)	(0.23)	(0.38)	(0.26)
Corruption	-1.46**	-1.41*	.667*	-0.68*	-1.13·
	(0.55)	(0.52)	(0.32)	(0.15)	(0.56)
Law	1.20*	1.39 **			1.63*
	(0.58)	(0.50)			(0.55)
Effectiveness	1.15	1.23*		1.67***	0.65
	(0.69)	(0.45)		(0.00)	(0.44)
Regulatory	-0.04				
	(0.46)				
Stability	0.20				
	(0.26)				
lnGDP	0.11				
	(0.15)				
Asia					0.95*
					(0.39)
Africa					-0.48
					(0.32)
Latin America					0.72
					(0.41)
Standard error of regression (σ_ε)	1.51	1.50	1.56	1.54	1.42
R^2	0.18	0.18	0.12	0.15	0.29

The estimated standard error of the estimated coefficients of the independent variables are listed in parentheses below the predictors.

The lnGDP is a log of the real GDP per capita.

Significance values are coded as such: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. The significance suggests the likelihood that the estimated co-efficient might actually equal zero. As such, the lower the significance value, the less likely that the actual co-efficient would be equal to zero.

Data: Center for Global Development, MDGs Progress Index 2011; World Bank, GDP per capita data set 2009-2013 (US$)*, and World Bank Governance Indicators, 2012.

*For countries without data in the period of 2009-2013, the score is taken from available data; Belize (2011), Cuba (2011), Djibouti (2007), Libya (2009), Syrian Arab Republic (2007), Myanmar (UN data, 2011).

Table 5: Summary of Models and Results

Model 1	• The full multivariate regression model: regresses all six WGIs with controls for lnGDP onto MDGs Progress Index. • Model shows the basic structure of results with positive and significant rule of law and government effectiveness coefficients and negative and significant coefficients on voice and accountability and control of corruption coefficients.
Model 2	• A pared down multivariate regression model: regresses four WGIs of interest onto MDGs Progress Index. • Similar to above results, model shows the basic structure of results with positive and significant rule of law and government effectiveness coefficients and negative and significant coefficients on voice and accountability and control of corruption coefficients.
Model 3	• A pared down multivariate regression model: regresses control on corruption and voice and accountability onto MDGs Progress Index. • Model shows a significant and positive control on corruption coefficient without other WGIs; suggests possible multicollinearity. • Model also shows voice and accountability coefficient is negative and not statistically significant
Model 4	• An elaborated version of model 3: regresses government effectiveness, control on corruption, and voice and accountability onto MDGs Progress Index. • Model shows that the control on corruption changes sign when government effectiveness is included in the model; suggests possible multicollinearity.
Model 5	• The dummy variable model: regresses four WGIs of interest as well as regional dummy variables onto MDGs Progress Index. • Model shows that the government effectiveness no longer significant when Asia and Africa dummy variables added into the model; suggests regions may be soaking up some of the explanatory power of government effectiveness.

To test the robustness of the estimated relationships and control for particular properties of different regions, a set of regressions were run with dummy variables for Asia, Latin America, and Africa (Model 5). The results from this regional control model are also interesting. Similar to the first model, the rule of law variable appears to be both statistically and substantively significant at roughly the same magnitude as the other models. Also comparable to many of the previous models, Model 5 reveals that both the control of corruption and the voice and accountability are statistically significant and run the opposite direction of that argued in much of the development literature. The relative size of the estimated coefficients are approximately the same as model 1 – with a modest increase in the negative value for voice and accountability and modest drop in the negative

value of control of corruption.

The final noteworthy finding is that the controls for the regional dummy variables for Asia and Latin America appear to have a positive effect on MDG progress. *Ceteris paribus*, countries in Asia tended to score one point higher on the MDG progress index than countries outside these three regions (Central Europe and Oceania). Being from Latin America has an effect that is nearly as large. Just as interesting, with the controls for different regions, that impact of government effectiveness appears to fade. That is, it is no longer statistically significant as suggested by the change in the p-value > .10. This suggests that there may be a correlation between from Asia and Latin America, on the one hand, and higher levels of government effectiveness, on the other. Such a correlation

between two independent variables can cause instability in the estimates of variance of the correlated predictor variable – in this case, government effectiveness. This condition is known as multicollinearity and is discussed in greater detail in the next section.

4.2. Multicollinearity

One of the curious results from the regression models is the negative signs on the coefficients for the voice and accountability and control on corruption variables. This result appears to run counter to the conventional view that countries with higher levels of voice and accountability and control of corruption would make more progress on development goals. This result is even more curious when the other governance variables are removed from the model; in the pared down forms of the model control of corruption appears to have a positive effect on MDG progress (see Model 3 in Table 4).

A possible explanation for the unexpected result in Model 1 is that the control of corruption variables are closely correlated with other independent variables in the model such as government effectiveness or rule of law. A strong correlation between two or more independent variables can give rise to the aforementioned multicollinearity. Multicollinearity can cause large standard errors on the regression coefficients, which can cause true model parameters to become unstable and thereby diminish t-values. A related sign of multicollinearity is the generation of coefficient estimates with the wrong sign—such as might be the case with control of corruption.

Three steps can be taken to look at whether multicollinearity exists and whether its possible effect on the coefficient estimates warrant concern. The first such step involves generating a correlation matrix that illustrates the simple pairwise correlation between the different governance variables in the model. As illustrated in Table 6, there appear several strong relationships between the governance variables; some come very close to the .9 level that is considered a threshold beyond which there is likely to be problems with the estimates in the model. Of particular concern is the strong correlation between the government effectiveness, the rule of law and control of corruption variables.

Table 6: Correlation Coefficients between Governance Variables

	Voice	Stability	Effectiveness	Regulatory	Law	Corruption
Voice	1	0.66	0.66	0.72	0.77	0.68
Stability	0.66	1	0.59	0.49	0.78	0.71
Effectiveness	0.66	0.59	1	0.88	0.85	0.86
Regulatory	0.72	0.49	0.88	1	0.76	0.73
Law	0.77	0.78	0.85	0.76	1	0.88
Corruption	0.68	0.71	0.86	0.73	0.88	1

A second step involves looking more closely at what is known as the variance inflation factor (VIF). The variance inflation factor (VIF) provides an arguably better indication whether and to what extent multicollinearity is affecting the sign and significance of key variables. The VIF can be calculated for each predictor variable by running a linear regression of that predictor of interest on all the other independent variable, and then obtaining the R^2 from that regression. The VIF then takes the inverse of the 1 subtracted from the R^2 or $1/(1-R^2)$. Though there is no hard and fast rule, generally speaking VIF's greater than 10 are a sign of multicollinearity (Belsley, Kuh, and Welsch, 2004), though others question whether

there is a standard rule of thumb for VIFs (O'Brien, 2007). In the case of the full model, the VIF for government effectiveness of 9.79 and rule of law of 8.69 comes very close to the 10 threshold. However, it is also important to point out that when regulatory quality and political stability are removed from the model—which is feasible given that they are neither significant nor add much explanatory power to the model—the level of the VIF falls to below six (see Table 7). Further, when regulatory quality and political stability are removed from the model, both the signs and the magnitude of control of corruption variable remains essentially the same.

Table 7: Variable Inflation Factors

	Full Model	Model with Regulatory, Stability, and lnGDP removed	Model with Voice, Regulatory, Stability, and lnGDP removed
Voice and Accountability	3.02	2.44	
Corruption	5.68	5.55	5.55
Effectiveness	9.79	4.49	4.5
Law	8.69	6.85	5.44
Regulatory	5.4		
Stability	3.02		
lnGDP	1.56		

A final diagnostic involves a procedure known as ridge regression. Ridge regression involves introducing small degrees of bias into the diagonal elements of the correlation matrix. If the introduction of a small amount of bias leads to a significant change in the value and/or sign of the predictors, then one could feel reasonably secure that collinearity is causing problems for the estimated coefficients. Interestingly, using this procedure the only variable which appears to be sensitive to multicollinearity is the regulatory

quality variable as opposed to the other featured variables in the model 5.

5. Research Limitations

In considering the robustness of the paper's main findings, it is also important to underline limitations. One such limitation is related to the WGI data used to proxy key functional properties of governance. The WGI variable has been the target of several notable critiques. For example, some argue that the WGI fails to capture the reality of countries'

governance structure due to: 1) its perceptual biases and selection problems; 2) lack of convincing evidence on the effect of governance on long-term growth due to data resources based on recent short-term growth; and 3) weak consideration of changes over time due to aggregated governance indicators that start with the global averages for every period (La Porta, 1997; Arndt and Oman, 2006; Kurtz and Schrank, 2007: Hulme et al, 2014). Those responsible for the developing the governance indicators have responded to these critiques with well-reasoned counterclaims (Kaufmann et al., 2006, 2007, 2010). Perhaps the best response is that it is important to keep in mind that the WGI reflects one rather high level view on governance and additional research will be needed to capture some of the mechanisms that are discussed in the literature.

A second possible limitation relates to the MDG Progress Index. One of the critiques of not only this index but the MDGs more generally is that many of the targets apply unevenly across the countries (Fukuda-Parr, 2010). For instance, it would be far easier for a country with already high levels of school enrollment to get across the MDG threshold than countries starting at lower levels. As such, it would be relatively more facile for countries to make progress or be on track for achieving a goal if they were already closer to that goal. While this is indeed a useful critique, it is mitigated to certain degree by the scoring system for the MDG index variable which gives countries a half point for making progress toward a goal. This rather rough formulation gives credit to countries if they are moving in the right direction even if they are not on pace to achieve a goal.

Another potential limitation involves the inclusion of dummy variables for regional controls. While dummy variables offer a useful approach for capturing the underlying historical, sociopolitical, and cultural traditions in a particular region, they do little to illuminate what it is specifically about those traditions that matter for the outcome variable in question. This critique suggests the need to supplement large-n statistical studies with smaller-n descriptive studies to complement the inferences drawn from the data analysis. In fact, for reasons having to do with both the regional dummies and the other WGI variables, a logical follow up would be to look more closely at key countries in different regions and how different governance attributes influenced key development outcomes. Similarly, it would also be helpful to look at specific goal areas to discern whether the relationships revealed through the data analysis hold for a water or energy goal. The inclusion of enabling targets for means of implementing likely sector specific goals in the SDGs takes a step in this direction.

A final set of limitations relates to the implied parallels between the MDGs and the post-2015 development agenda. While it is still too early to predict precisely what the post-2015 development agenda will look like, much of the discussion has revolved around developing a set of goals that are more aspirational, integrated, and universal than the MDGs. As such, it is not altogether clear that the same properties that were associated with the MDGs in their initial incarnation will apply to the post-2015 MDGs and/or SDGs. To look more carefully at possible parallels future research might begin by running similar sets of models on, for instance, measures of environmental sustainability.

6. The Way Forward

In sum, the findings suggest some results that are largely consistent with the development literature, namely, that government effectiveness and rule of law appear to have a positive impact on progress with the MDGs. However, they also produce some rather surprising results, namely, that the control of corruption and voice and accountability seem to have an, at best, muted and, at worst,

counterproductive effect on achievement of the MDGs than expected by the conventional literature—although this finding should be treated with caution for the control on corruption variables. Finally, there appears to be a correlation between effectiveness and the Asia and Latin America regional controls.

Several policy implications follow from these findings. First, rule of law seems to have an important impact on achievement of the MDGs. Second, government effectiveness may also be a useful area to target for improving governance—perhaps most notably in Africa and/or Central Europe. Weak governments for some countries in Africa (Evans, 1995) may hence need additional strengthening; calls for shrinking government may need reconsideration (Kimura, 2007).

While these results are thought provoking, given data and interpretive limitations it would be best to look more closely at which countries performed well on these indicators and why for more concrete guidance. An interesting case for deeper inquiry is Chile. Chile is widely considered to have a relatively effective government and strong rule of law, achieving the highest score on the World Bank's 2013 government effectiveness and rule of law indicators. It would therefore be helpful to more carefully analyze the chain of events beginning with Chile's post-Pinochet government reforms and following through to the establishment of checks and balances on existing political and legal institutions that helped bolster support for "multiparty coalitional building" (Helmke and Levitsky, 2004). The resulting multiparty coalition passed several sound environmental and economic policies as well as accounting and corporate governance standards that contributed to the country's development (Poniachik, 2002; Chavez, 2003). The Chilean experience also shows a

possible interrelationship between government effectiveness and rule of law that could be researched more closely in the future.

Another area for potentially fruitful research would be expanding the scope of governance to look more broadly at the role of actors outside of governments. A fast growing literature on multi-level, multi-stakeholder governance underscores the diversity of actors that play important roles in delivering global and local public goods (Hooges and Marks, 2001). Of particular importance for the post-2015 development agenda would be interactions between the public and private sector.

Finally, many of the other variables do not seem to have the anticipated positive impact on governance for the MDGs. This is the case for control of corruption and voice and accountability. While it is important to highlight these findings, it is just as important to note that these are but one of a set of findings of several results on the relationship between voice and accountability and control of corruption and key development indicators. In the future, it would be good to try different specifications to test similar hypotheses to those examined here.

Though there are clearly more avenues to investigate, the paper does begin to shine some intriguing light on recommendations for good governance that is often advocated but less frequently analyzed. The paper claims that governance needs to be unpacked into its constitutive components and their actual effectiveness needs to be assessed before governance can be adopted as a goal with concrete targets and indicators by the international community. The need for unpacking governance should have resonance not only for the MDGs or SDGs but other international treaties and initiatives where governance is believed to be important.

Table 8: List of Top 5 Countries in MDGs Progress, WGI (for four selected dimensions)

	MDG Progadj		VA		GE		RL		CC	
	Country	Score	Country	Score	Country	Score	Country	Score	Country	Score
1	China	8.00	Marshall Islands	3.69	Chile	3.69	Chile	3.75	Chile	3.93
2	Brazil	7.43	Palau	3.67	Malaysia	3.55	Mauritius	3.44	Uruguay	3.49
3			St. Lucia	3.62	Mauritius	3.11	Samoa	3.35	Botswana	3.39
4	Egypt, Arab Rep./ Honduras/ Ecuador/ Bosnia and Herzegovina	7.00	St. Vincent and the Grenadines/ St. Kitts and Nevis/ Micronesia, Fed. Sts./ Dominica	3.54	South Africa/ Lithuania	3.08	Palau	3.33	St. Lucia	3.31
5					Poland	3.07	St. Vincent	3.27	St. Vincent/ St. Kitts and Nevis/ Bhutan	3.18

Annex 1: List of Millennium Development Goals and Targets[1]

Millennium Development Goals (MDGs)	
Goals	**Targets**
Goal 1: Eradicate extreme poverty and hunger	Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day
	Target 1.B: Achieve full and productive employment and decent work for all, including women and young people
	Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger
Goal 2: Achieve universal primary education	Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling
Goal 3: Promote gender equality and empower women	Target 3.A: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015
Goal 4: Reduce child mortality	Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate
Goal 5: Improve maternal health	Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio
	Target 5.B: Achieve, by 2015, universal access to reproductive health
Goal 6: Combat HIV/AIDS, malaria and other diseases	Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS
	Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it
	Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
Goal 7: Ensure environmental sustainability	Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
	Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss
	Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation
	Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers
Goal 8: Develop a global partnership for development	Target 8.A: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system Includes a commitment to good governance, development and poverty reduction – both nationally and internationally
	Target 8.B: Address the special needs of the least developed countries Includes: tariff and quota free access for the least developed countries' exports; enhanced programme of debt relief for heavily indebted poor countries (HIPC) and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction
	Target 8.C: Address the special needs of landlocked developing countries and small island developing States (through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly)
	Target 8.D: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term
	Target 8.E: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries
	Target 8.F: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications

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[1] The Millennium Development Goals and targets come from the Millennium Declaration, signed by 189 countries, including 147 heads of State and Government, in September 2000 (http://www.un.org/millennium/declaration/ares552e.htm) and from further agreement by member states at the 2005 World Summit (Resolution adopted by the General Assembly - A/RES/60/1, http://www.un.org/Docs/journal/asp/ws.asp?m=A/RES/60/1).

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