

# **The Role of FDI, ODA, Remittances, and Institutions on Economic Development in Developing Countries**

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## **Abstract**

This paper seeks to evaluate the effects of foreign direct investment (FDI), official development assistance (ODA), and migrant remittances to economic growth in developing countries, while also taking into account the qualities of the institutions of the countries. This study uses the linear system Generalized Method of Moments (GMM) method as developed by Blundell and Bond (1998). Current research has been focused on adding institutions to growth models to understand how institutional quality can help improve outcomes in developing countries. This paper plans to further the discussion on how institutional quality affects FDI, ODA, and remittances. Institutional quality is measured using the World Governance Indicators, gathered by the World Bank. This study finds that remittances and FDI are important to economic growth. The findings also suggest that control of corruption may have an indirect effect on economic growth. Voice and accountability was also positive when examining remittances as well.

JEL Classification: O17

Keywords: Growth; FDI; Official development assistance; Remittances; Institutions

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## **1.0 Introduction**

Much of the focus of recent research in economic development has focused on how institutions impact the effects of key developmental factors. Since the late 1990s, poor institutional quality has been seen as a major barrier to economic growth for developing countries. International organizations, as well as developed nations, have, as a result, been imposing conditionalities that have forced developing nations to alter their institutions to become more similar to those of the developed countries, focusing on maximizing market freedoms and the protection of private property rights. This focus on institutions also manifests itself in the high number of recent academic papers on the subject, some of which will be discussed in the literature review section of this paper.

The importance of economic development in developing countries is further stressed by the Millennium Development Goals (MDGs), created by the United Nations in 2000. The purpose of these goals is to help reduce the divide in wealth between the developed countries and the developing countries. The eight goals set out in 2000 were intended to be met by 2015. These goals include the eradication of extreme poverty and hunger and the creation of a global partnership for development. This has led to a greater focus on economic development, and may be a major reason for the increased focus on institutional quality in developing countries in studies looking at economic growth.

Recently, many studies have been using the linear generalized method of moments (GMM) estimation method instead of using ordinary least squares (OLS) regression. The methods are different, but both seek to estimate some unknown parameter and the effects that certain other factors have on the parameter of interest. This study will use the system GMM, as developed in Blundell and Bond (1998).

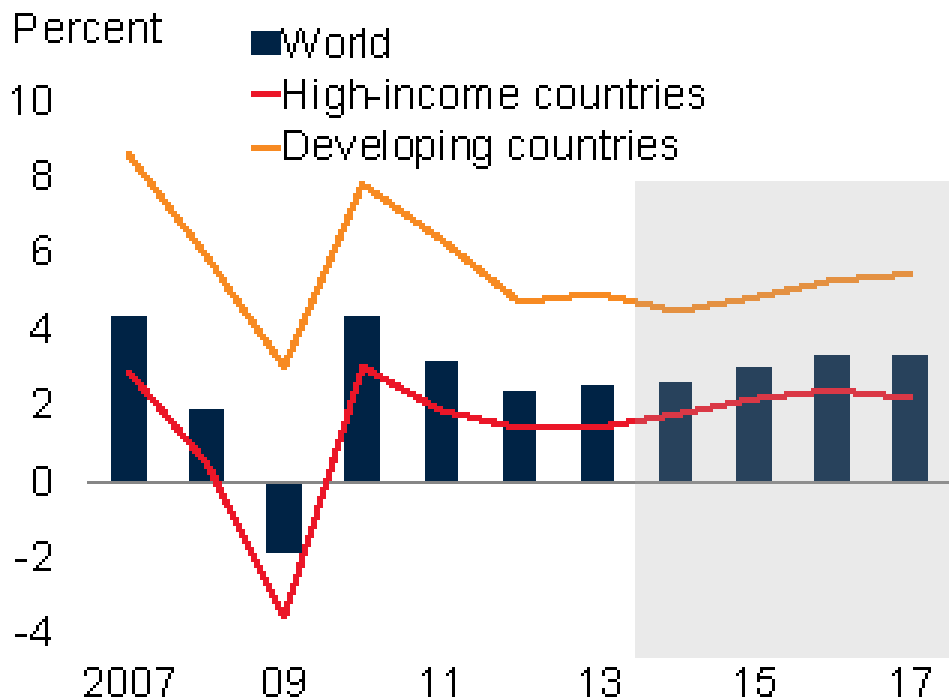
The rest of this paper is organized as follows. Section 2 examines recent trends in economic development. Section 3 looks at some of the research on institutions and economic development. Section 4 describes the data used in the model, as well as outlines the model that will be used in this paper. Section 5 discusses the results of the regression, and section 6 is a conclusion of the results.

## 2.0 Trend

The United Nations created the eight MDGs in 2000, with the goal of completing them by 2015. The eight goals were to eliminate extreme poverty and hunger, achieve universal primary education, reduce gender inequality and empower women, reduce infant mortality, improve maternal health, combat HIV/AIDS and other infectious diseases, ensure environmental stability, and develop a global partnership for development. These goals aim to not only increase growth in developing countries, but also seek real improvements in overall quality of life. Figure 1 shows the annual global GDP growth in annual percentage change terms from 2005 to 2013, with projections for 2014 to 2017 for both the developing countries and for the developed countries. With the exception of 2009, global GDP has been increasing each year, although the rate of growth has slowed after the crisis as compared to before for both developed and developing countries.

**Figure 1: GDP Growth in Developed and Developing Countries**

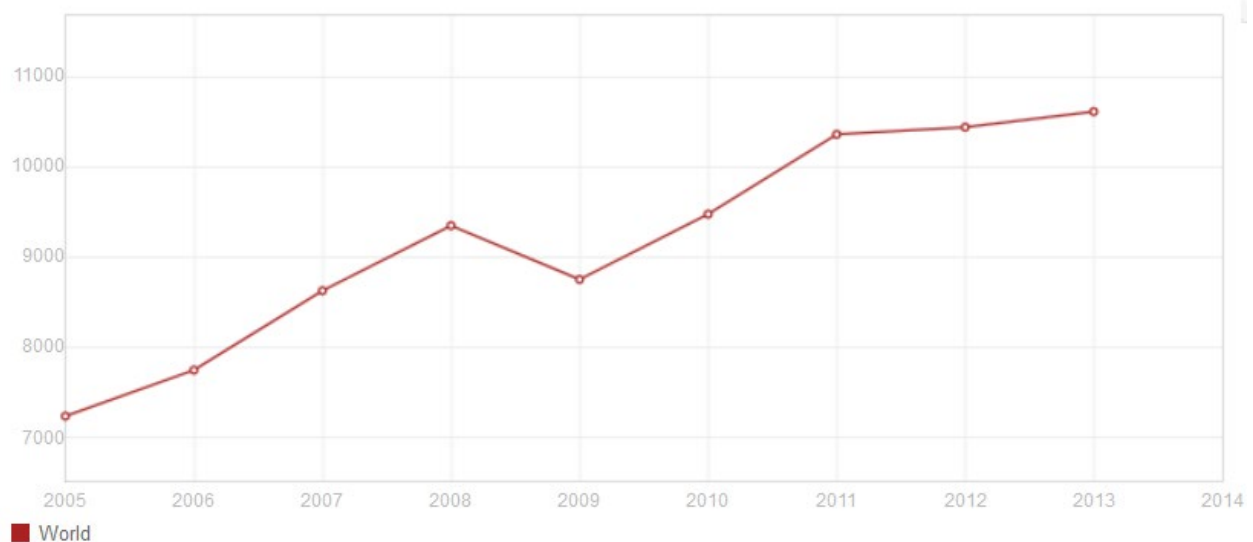
GDP growth, actual and projected



Sources: World Bank and Bloomberg.

A common measure of quality of life is GDP per capita. While this measure is imperfect, as it does not account for income inequality, it is still a useful measure for understanding how large a country is in terms of not only its output but also its population. Typically, higher GDP per capita means that people overall have higher incomes, allowing them to have higher rates of consumption, and thus also higher quality of life. Figure 2 shows the global GDP per capita from 2005 to 2013. Based on the graph, the GDP per capita has been steadily increasing, with the exception of 2009, which decreased, as did overall GDP, as a result of the global recession from the 2008 financial crisis. After the crisis, the growth rate of GDP per capita flattens out, implying that since the end of the financial crisis, the rate of GDP growth has slowed in relation to population growth worldwide.

**Figure 2: Annual GDP per Capita**



*Source: World Bank*

Even though global GDP and GDP per capita have been increasing, the rate has not been particularly high overall, and has slowed since the 2008 financial crisis. This slow-down in economic growth complicates matters when it comes to determining the proper policies needed to promote and sustainability. Since the financial crisis in 2008, it appears that there may have been a consistent change in how certain factors normally operate within economies across the board.

Another major concern when it comes to economic growth is the role of institutions. While it is easily agreed that institutions and governments play an important role in economic

growth, the problem is how to measure institutional quality, and which kinds of institutions are better for growth. Many of the developed countries have tried to impose their own values on the developing countries, assuming that their method to success is the only way. This leads to a focus on maximizing individual liberties, protecting property rights, and a capitalistic system. This may not be the most effective, however, as now there are examples of areas that are succeeding at growing their economies without becoming democratic. Singapore, Hong Kong, and China, for instance, have all seen substantial increases in GDP per capita, despite having highly autocratic governments. The success of these countries calls into question the idea that more freedom and better property rights leads to economic success.

### **3.0 Literature Review**

There have been many studies conducted in recent years examining the relationship between institutions and economic development. Tebaldi and Mohan (2010) studied the effects of institutions on poverty by using eight different measures of institutional quality. They found that better and more effective institutions reduced poverty through less income inequality. They also found that less effective governments increased poverty due to a decrease in average incomes as well as an increase in income inequality. Dias and Tebaldi (2012) looked into the effects of human capital and institutional quality on economic growth. This study used a micro-foundation model to establish the connection between human capital and institutions. The study then, using panel data, tested the model, finding that structural institutions had a meaningful impact on the growth of human capital, while political institutions did not. The study also found that growth in human capital was a more important factor for economic growth than was the level of human capital.

Esfahani and Ramirez (2003) researched how infrastructure affected economic growth, while also accounting for the influence of institutions on how inadequacies in a country's infrastructure were handled. The study found that the benefits to overall output of infrastructure services was greater than the cost of the services. A few studies looked into the effects of institutions on innovation in developing countries (Tebaldi and Elmslie, 2008, 2013). The 2008 study had included economic growth in the analysis, and found that sustainable growth in human capital increased economic growth, similar to the results found by Dias and Tebaldi (2012).

Tebaldi and Elmslie (2013) focused on the impact of institutions on innovation, finding that institutions had a major impact on the production of new patents.

Catrinescu et al. (2006) examined the effects of remittances on economic growth using a dynamic panel data estimation method, finding a weakly positive overall effect that is increased by sound economic policies and institutions. Driffield and Jones (2013) also examined the effects on economic growth of remittances, including FDI and ODA as well in their analysis, using simultaneous equations to also determine what effects FDI, ODA, and remittances had on economic growth. The study also included institutional variables in the model. The study found that, after taking into account the effects of institutions, all foreign sources of capital have a positive effect on growth. Rodrik (2000) attempted to find which institutions were the most important for promoting economic growth. Based on the results from this study, they concluded that local knowledge was key to determining how best to create the proper institutions necessary for economic growth, and that participatory democracies were most effective at aggregating local knowledge.

Rodriguez-Pose (2013) examined the question of the role of institutions on regional development and how to include institutions in regional development models. This study found that local institutions had a significant impact on economic growth and on the returns of economic policies, but that any models involving institutions would suffer from a lack of what defines a “good” institution over a “bad” one. The study concludes that “one-size-fits-all” strategies for promoting economic development may be impossible, while strategies tailored to specific regions may yield greater returns. Chang (2010) critically examines the recent research on the role of institutions on economic growth, and found a number of critical flaws in many of the studies. Some of the flaws highlighted in this study were the neglect of causality running from development to institutions, the inability to see the impossibility of a free market, and a belief in the freest market and strongest private property protections as the best policies for economic growth. The study also critiques the methods that support these ideas as relying too heavily on cross-sectional econometric studies, and that current discourse shows a poor understanding of the changes in institutional quality.

Based on the above studies, while there is a large and growing body of literature on the role of institutions on economic development, there are some issues, one of which being what kinds of institutions are beneficial, as well as how to measure institutional quality. The methods

used to study the effect of institutions is also a key factor in how useful the literature is for policy, and of particular importance is how institutions are factored into the models.

Driffield and Jones (2013) had used simultaneous equations in order to estimate their model, since they felt that they did not have enough data to be able to use other methods of dynamic panel data estimation. Dynamic panel data estimation analysis allows for the use of some elements of time series regressions in a panel setting. Arellano and Bond (1991) developed what is commonly referred to as the difference GMM for use with panel data with a few number of time periods relative to a large number of panels, and includes the lagged dependent variable in the model. In the estimation of the difference GMM, the first differences of each variable rather than current values, is used in order to prevent non-stationary data from biasing the results. This method was developed further by Blundell and Bond (1998) in a method referred to as a system GMM. The system GMM runs two separate equations, one with the first differences, and another with the levels, allowing for further specification within the model. Both the Arellano and Bond (1991) method and the Blundell and Bond (1998) method are able to be used in both one-step and two-step GMM processes. These methods of dynamic panel data estimation allows for a better understanding of what is happening based on the data at hand, and will be used in this study. The advantage of this method is that unbalanced data do not hurt the results too significantly, and the small number of time periods and large number of panels is the kind of dataset that these methods were designed to work with.

## **4.0 Data and Empirical Methodology**

### **4.1 Data**

The data is collected from the World Bank, and is divided up into four different income categories. The four groups are Low, Lower Middle, Upper Middle, and High (non-OECD). Data from each of the countries in these categories will be estimated using the models discussed in more detail in the next section. The data on most of the variables were taken from the World Development Indicators Database, with the exception of the institutional variables, which are taken from the World Governance Indicators. The summary statistics for the variables are below in Table 1. The data span from 2002 to 2013, and include all of the countries in the four non-OECD income groups, with the exclusion of some countries that could be potential outliers and countries with a high number of gaps in the data. By excluding OECD countries, the study is

able to focus solely on developing countries. The absence of potential outliers prevents these countries from skewing the results. Although the estimation method that will be used in this study does allow for some gaps, the countries which were removed had very sparse data, or had no data at all for certain statistics. This could lead to the exclusion of a significant amount of data from the regression, making the results weaker. Although data is gathered for 2002 to 2013, the first differencing and lagging of the variables eliminates at least the first two data points in the data that will be used in the estimation of the models.

**Table 1: Summary Statistics**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Control of corruption</b>	1781	-.365857	.7164779	-1.815871	2.416693
<b>Investment</b>	1610	24.15406	9.407612	1.525177	116.204
<b>GDP per capita, % change</b>	1747	2.925279	5.838989	-62.46561	102.771
<b>Government Expenditure</b>	1232	6.551854	31.14778	-77.18118	830.9091
<b>Trade</b>	1648	92.5884	52.34923	21.67383	458.3322
<b>Government effectiveness</b>	1779	-.3569604	.7349793	-2.247729	2.429651
<b>FDI inflows</b>	1769	5.465381	7.288682	-19.37838	91.00733
<b>ODA</b>	1439	7.786633	12.0354	-2.611939	181.1872
<b>Political stability</b>	1777	-.2694283	.9422114	-3.184814	1.543135
<b>Remittances</b>	1488	5.653952	7.66	.000039	59.31354
<b>Rule of Law</b>	1787	-.369883	.7547636	-1.955725	1.772444
<b>Regulatory quality</b>	1779	-.3242688	.7619932	-2.675439	1.996294
<b>Voice and accountability</b>	1788	-.3026485	.8208616	-2.209712	1.345843



## 4.2 Empirical Model and Expected Results

The models used will follow the estimation methods as outlined in Blundell and Bond (1998) to estimate the data using first differences and one lag of the variable of interest, using the system GMM estimation method. The general model that will be estimated is displayed below.

$$\text{GDP}_{i,t} = \alpha + \beta_0 \text{GDP}_{i,t-1} + \beta_1 \text{FDI} + \beta_2 \text{ODA} + \beta_3 \text{REM} + \beta_4 \text{GCF} + \beta_5 \text{GOVEXP} + \beta_6 \text{TRADE} + \beta_7 \text{INSTITUTIONS} + \epsilon_{i,t}$$

In the above model, GDP is the percentage change in annual growth of GDP per capita, FDI is measured by the net FDI inflows as a percent of GDP, ODA is measured by ODA inflows as a percent of GNI, REM is measured by the inflows of remittances as a percent of GDP, GCF is measured by the gross capital formation as a percent of GDP, and seeks to measure the level of investment in each country. GOVEXP is the government expenditure as a percent of GDP, and TRADE measures the level of trade openness (calculated as imports plus exports divided by GDP). The institutional variables that will be included are control of corruption, regulatory quality, and voice and accountability, each added into the model separately to prevent the high correlation between these variables from biasing the results. Each of the variables also will have one lag included in the first difference equation, following the Blundell and Bond (1998) method. The expected results are listed below in Table 2.

**Table 2: Expected Results**

<b>Variable</b>	<b>Expected Sign</b>	<b>Significance</b>
<b>FDI</b>	+	Yes
<b>ODA</b>	+	Yes
<b>Remittances</b>	+/-	Yes
<b>Investment</b>	+	Yes
<b>Government Expenditure</b>	+	Yes
<b>Trade Openness</b>	+/-	No
<b>Control of Corruption</b>	+	Yes
<b>Government effectiveness</b>	+	Maybe
<b>Political stability and absence of violence</b>	+	Maybe
<b>Rule of law</b>	+	Maybe
<b>Regulatory quality</b>	+	Maybe
<b>Voice and accountability</b>	+/-	Yes

Each of the variables are expected to have some positive effect on economic growth, with the exception of remittances and voice and accountability, which may be either positive or negative. Remittances could either encourage laziness from workers, or bolster spending from poor families receiving the help of family members working in another country. Voice and accountability measures the freedom of the press and media, and a more free press and media may undermine the effectiveness of the government or undercut support for it, which could reduce economic growth. After testing for multicollinearity among the institutional variables, the only institutional variables that will be used of the ones listed above will be control of corruption, regulatory quality, and voice and accountability. Control of corruption is important due to the effect of corruption on inflows of capital into a country, with worse control of corruption reducing the amount of investment in the country. Regulatory quality is highly correlated with government effectiveness and rule of law, so it will be used to determine the overall impact of the legal system and regulatory environment on economic growth. Voice and accountability is an important variable to see whether or not freedom of speech helps or hurts developing countries. All of the variables will be included in the GMM-style equations. The IV-

style equations (in levels only) will include a time dummy for 2009, associated with the negative global economic growth from the 2008 financial crisis in the developing countries.

Some of the variables used in this model may not be strictly exogenous to the model. This possibility of endogenous variables included in the model would bias an OLS regression, as would non-stationary data-generating processes in the variables included. Each of the variables will be estimated in the first difference, since each of the variables is assumed to be generated by a non-stationary stochastic process, as many economic variables are. The institutional variables may also potentially be strictly exogenous. To test for endogeneity, these variables will be included in both the GMM-style equations, and the IV-style equations. The estimation results will also be accompanied by the results of the overidentification tests, both the Sargan test and the Hansen test, and the Arellano-Bond AR tests.

## **5.0 Empirical Results**

As discussed in section 4, the three institutional variables of interest will be included in the model separately. The results of the models with the institutional variables included with the GMM-style instruments are displayed in Appendix A, and the results of the models with the institutional variables included in the IV-style instruments are included in Appendix B. The first model in each set of regressions is the same, and includes none of the institutional variables, to serve as a baseline for comparison. Each model is estimated using the two-step system GMM, with Windmeijer's (2005) finite sample standard error correction and collapsed instrument matrices.

One of the most notable results is that of the time dummy for 2009. This year had a very strongly negative effect on GDP, as a result of the global economic slowdown that occurred after the financial crisis. This result was very consistent across each of the models run. In the baseline model, model (1), only government expenditure and investment are statistically significant. Trade openness, despite being small, negative, and statistically insignificant, is still an important variable to include. Interestingly, ODA was small, negative, and statistically insignificant in each model that it was included in.

In the models with the institutional variables included with the GMM-style instruments (models (2), (3), and (4)), control of corruption and regulatory quality had little effect on the values of the coefficients of the other variables, and were insignificant. In model (2), which

included control of corruption, the P-value for trade openness was noticeably lower, however. Other than that, models (2) and (3) had results that were very similar to those in model (1). Of these three models, the one with the most meaningful results is model (4), which included voice and accountability. Not only was voice and accountability statistically significant at the 10% level, but including this variable in the model also made remittances show a larger effect and statistically significant at the 10% level and government expenditure insignificant. This model showed strong positive effects from both remittances and voice and accountability.

In the models with the IV-style instruments including the institutional variables (models (5), (6), and (7)), none of the institutional variables had a significant impact on the model. Control of corruption (included in model (5)) was closer to being statistically significant, and, as in model (2), made the trade openness variable closer to being significant. Based on these results, control of corruption appears that it may have some weak effect on economic growth, but probably not in a direct way. The results reveal little about the effectiveness of regulatory quality on impacting economic growth. Voice and accountability does appear to have a strong positive effect on economic growth, especially in conjunction with remittances.

Of the sources of foreign capital, FDI and ODA were mostly consistent and statistically insignificant. Remittances was insignificant in all of the models except for (4). FDI and remittances were always positive and larger than ODA in absolute terms, while ODA was always rather small and negative. Based on these results, FDI appears to have a weak positive effect on economic growth and remittances have a slightly stronger positive effect on economic growth. The results on ODA show a lack of significant effects on economic growth from ODA, however.

The Sargan tests for overidentification find that the results are not robust, but also not weakened by too many instruments. However, having too many instruments also weakens the Sargan test, which may be the reason for this result. The Hansen test, on the other hand, finds the estimates robust, but weakened by too many instruments. The P-value on the Hansen test for each model varies between 0.325 and 0.358, with the exception of model (4), which has a P-value of 0.424. The higher P-value on the Hansen test on model (4) may mean that voice and accountability being included in the GMM-style instruments may cause a greater problem of having too many instruments in the model. This implies that the results from model (4) may have been weaker, which may explain why government expenditure had become insignificant at the 10% level in model (4).

## **6.0 Conclusion**

In conclusion, the results of this study find that FDI and remittances have a fairly weak positive effect on economic growth, a result that is consistent with the literature. The effects of ODA, however, were not found to be significant. Of the institutional variables examined, control of corruption had shown that it may have some indirect effect on economic growth, while regulatory quality was not found to have any significant effects. Voice and accountability was found to have a fairly strong positive effect, especially alongside remittances. Overall, the effect of foreign capital has a net positive effect on economic growth, and better institutions can help to further this positive effect. Based on these results, developing nations should seek to improve the qualities of their institutions as it relates to control of corruption and voice and accountability as a means of furthering economic growth, while also encouraging more FDI and remittances.

**Appendix A – Results with Institutional variables in GMM Instruments**

	(1)	(2)	(3)	(4)
	GDP per capita growth	GDP per capita growth	GDP per capita growth	GDP per capita growth
GDP per capita growth (lagged)	0.293*** (0.000)	0.285*** (0.000)	0.291*** (0.000)	0.293*** (0.000)
Investment	0.0498** (0.019)	0.0544*** (0.007)	0.0631*** (0.007)	0.0585*** (0.006)
Government Expenditure	0.0604* (0.057)	0.0505* (0.089)	0.0542** (0.036)	0.0426 (0.170)
Trade Openness	-0.00975 (0.516)	-0.0129 (0.386)	-0.00111 (0.930)	-0.00839 (0.536)
FDI	0.0232 (0.646)	0.0256 (0.627)	0.0183 (0.695)	0.0139 (0.767)
Remittances	0.0884 (0.193)	0.0947 (0.208)	0.0793 (0.216)	0.115* (0.071)
ODA	-0.0137 (0.581)	-0.00906 (0.728)	-0.0111 (0.671)	-0.00625 (0.796)
Time Dummy for 2009 (crisis)	-3.292*** (0.000)	-3.363*** (0.000)	-3.250*** (0.000)	-3.268*** (0.000)
Control of Corruption		1.444 (0.250)		
Regulatory Quality			0.870 (0.474)	
Voice and Accountability				2.178* (0.069)
Constant	2.105* (0.082)	3.126** (0.041)	1.722 (0.150)	2.712** (0.038)
<i>N</i>	696	696	696	696

*p*-values in parentheses

\* *p* < 0.10, \*\* *p* < 0.05, \*\*\* *p* < 0.01

**Appendix A (Continued): Overidentification Tests**

Overidentification Tests (P-values)	(1)	(2)	(3)	(4)
Arellano-Bond Test for AR(1)	0.001	0.001	0.001	0.001
Arellano-Bond Test for AR(2)	0.749	0.728	0.695	0.706
Sargan Test	0.000	0.000	0.000	0.000
Hansen Test	0.358	0.325	0.329	0.424

**Appendix B – Results with Institutional variables in IV Instruments**

	(1)	(5)	(6)	(7)
	GDP per capita growth	GDP per capita growth	GDP per capita growth	GDP per capita growth
GDP per capita growth (lagged)	0.293*** (0.000)	0.292*** (0.000)	0.293*** (0.000)	0.294*** (0.000)
Investment	0.0498** (0.019)	0.0504** (0.024)	0.0512** (0.018)	0.0503** (0.020)
Government Expenditure	0.0604* (0.057)	0.0583* (0.062)	0.0586* (0.062)	0.0630* (0.051)
Trade Openness	-0.00975 (0.516)	-0.0141 (0.348)	-0.0101 (0.498)	-0.00885 (0.557)
FDI	0.0232 (0.646)	0.0252 (0.637)	0.0243 (0.632)	0.0204 (0.688)
Remittances	0.0884 (0.193)	0.102 (0.178)	0.0935 (0.169)	0.0967 (0.169)
ODA	-0.0137 (0.581)	-0.00934 (0.707)	-0.0101 (0.676)	-0.0130 (0.598)
Time Dummy for 2009 (crisis)	-3.292*** (0.000)	-3.335*** (0.000)	-3.298*** (0.000)	-3.280*** (0.000)
Control of Corruption		0.661 (0.177)		
Regulatory Quality			0.356 (0.375)	
Voice and Accountability				0.198 (0.482)
constant	2.105* (0.082)	2.735** (0.046)	2.216* (0.078)	2.057* (0.092)
<i>N</i>	696	696	696	696

*p*-values in parentheses

\* *p* < 0.10, \*\* *p* < 0.05, \*\*\* *p* < 0.01



**Appendix B (Continued): Overidentification Tests**

Overidentification Tests (P-values)	(1)	(5)	(6)	(7)
Arellano-Bond Test for AR(1)	0.001	0.001	0.001	0.001
Arellano-Bond Test for AR(2)	0.749	0.750	0.745	0.744
Sargan Test	0.000	0.000	0.000	0.000
Hansen Test	0.358	0.336	0.353	0.343

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