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Which Institutions Promote Growth? Revisiting the Evidence

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WORKING PAPER

No. 3/2016

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February 19, 2016

Abstract: Recent research examining the growth impacts of institutions have found that institutions are important in fostering economic growth. By building a framework around the institutional taxonomy proposed by Rodrik (2005), our paper contributes to the literature in the following way. First, we confirm the result that “institutions matter” and show that different types of institutions matter differently for growth. By applying a dynamic panel model, we find that market-creating and market-stabilizing institutions are important in fostering economic growth. We then extend this analysis and investigate whether countries at different levels of development could respond heterogeneously to changes in their institutional structure. We find that poor countries benefit the most from market creating institutions and institutions that support market stability. We also find some evidence that market legitimizing institutions such as “democracy” are not necessarily optimal for growth in poor countries. These results have important implications for countries that decide on the optimal strategy to improve their institutional framework.

Keywords: Institutions, Growth, Dynamic Panel, System GMM

JEL Classifications: O11, O30, O43, O50

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1. Introduction

What are the fundamental causes of economic prosperity and long-run development? This issue has long been debated in the economic growth literature. While some economists concentrate on the determinants such as geography, human capital, trade and other macroeconomic variables in promoting growth, the role of institutions as a primary determinant of economic growth has gained more importance in recent years.¹ Recent work by Acemoglu, Johnson and Robinson (2001), Easterly and Levine, (2003) Rodrik, Subramanian and Trebbi (2004), Acemoglu and Johnson (2005), Rodrik (2005) and many others have argued the primacy of institutions over other deep determinants of economic growth.

From a theoretical standpoint, the mechanisms that underpin the relationship between institutions and economic growth are extremely diverse.² As a result, empirically untangling the web of causation that links institutions and economic growth has been confronted by issues of endogeneity and reverse causation. Recent econometric studies, however, have made credible advances. Often considered a seminal paper in the institutional literature, Acemoglu, Johnson and Robinson (2001) introduced an identification strategy that uses exogenous variation in settler mortality rates faced by colonialists as instruments for current day institutions. The intuition behind this instrumental variable approach was that while such rates are correlated with past and subsequently contemporaneous institutions, the settler mortality rate itself should not directly impact output and growth today. After accounting for endogeneity, the authors found that a substantial amount of the differences in incomes across countries can be explained. Easterly and Levine (2003) and Rodrik et al. (2004) both address the aforementioned debate between the primacy of institutions over geography and policies. While both are nuanced and differ slightly in their final interpretations and recommendations, the general theme is that institutions rule over geography and policy with respect to fundamental causes of economic growth, and any impact of geography on growth mainly feeds through institutions.

The hypothesis that “institutions matter” has not gone without its critics. Glaeser et al. (2004) critique the institutional argument from a different vantage point to that of the “geography” and “policy” proponents. They examine the possibility that growth in income and human capital leads to better institutions through the empowerment of citizens bringing about an understanding and engagement with government. The authors argue that the institutional variables used in much of the previous literature are measurement based and not constraint based, leading to incorrect inferences. They also argue that there are serious shortcomings with the instruments often employed in the instrumental frameworks. Arguing along a similar line, Kurtz and Schrank (2007a,b) fundamentally question the paradigm that institutions have a causal impact on growth. The authors argue strongly against the ad hoc assumptions implicitly made in much of the empirical literature regarding institutions and governance, especially given the weakness in commonly used governance and institutional measures.

Given the inadequacies of the institutional measurements and econometric methodology used in previous studies, further research is needed. The previous research has often treated institutions either in isolation, or as a summary variable aggregating an entire array of often subtly different institutional types. Measuring institutions using diverse measures or proxies, while classifying them all under the same general socio-political and institutional category, can cloud the different channels via which institutions impact growth. Recent empirical research has addressed this criticism by being specific in its institutional measures, for example, those that protect property rights and ensure that markets exist and perform properly.³ Rodrik

¹See Barro (1998), Hall and Jones (1999), Frankel and Romer (1999), Dollar and Kraay (2003) and Chang et al. (2009) among others for a discussion on the different determinants of economic growth.

²For an enlightenment on this issue, see North (1981, 1990).

³See Acemoglu and Johnson (2005).

(2005) supports this viewpoint, but also adds that institutions need to be examined along a much wider and broader spectrum. Long-run economic development requires more than just a boost to investment and entrepreneurship. He argues that countries also require institutions to sustain the growth momentum, build resilience to shocks, and facilitate socially acceptable burden sharing in response to such shocks. The main dilemma within institutional economics is no longer “Do institutions matter?”, but more subtly “Which institutions matter, and for whom?”.

This paper attempts to further unbundle institutions. By building a framework around the institutional taxonomy proposed by Rodrik (2005), we re-visit the debate on institutions and growth. The paper closest to our idea is Bhattacharyya (2009). While the author examines whether human capital and different types of institutions affect economic growth, we extend his analysis along three dimensions. First, we take a step further to analyze whether a country’s level of development have differential impacts on the different types of institutions and hence economic growth. We argue that countries at different levels of development respond heterogeneously to changes in their institutional structure. It is important to understand this heterogeneity in response to different institutional structures as it enables us to make specific statements about how and which institutions should be improved in different countries in order to promote further economic growth and development. Second, we use sub-sample analysis to address the concern of parameter homogeneity which is implicitly imposed with the system GMM dynamic panel estimations. When dealing with institutions and economic development, it is arguable as to why one would expect countries with vastly different levels of wealth and institutional development to grow similarly in response to the same stimulus. Finally, we provide interpretations of growth impacts in terms of relative comparisons. Non-concrete units of measurement makes it difficult to quantify and interpret the effects of the institutional variables. We provide valid relative comparisons that helps us understand the relative roles of institutions in fostering economic growth.

We find that market-creating institutions have a very significant role in promoting economic growth. We also find that market-stabilizing institutions have an impact on growth, although this effect is sometimes weak. Our empirical tests also confirm that a strong and significant interaction of institutions and the level of development of a country does exist. We find that market-creating and market-stabilizing institutions are much more important for the lower income countries. This result was robust to different decile, quartile and median income level interactions. There was also evidence that for richer countries, market-legitimizing institutions such as the strength of the democratic institutions have a significant impact on economic growth. At the same time, we also find some evidence that democratic institutions are not necessarily optimal for growth for poor countries.

To summarize, our paper helps formalize a coherent framework for understanding which institutions matter for which countries. It is capable of explaining the dynamic linkages between institutions and long-run economic performance. Our results have important policy implications for particularly poorer countries that decide on the optimal strategy to improve their institutional framework. It also highlights the potential pitfalls of institutional reforms. Especially for poorer countries, avoiding such pitfalls may be valuable starting point and possibly the first step towards knowing how to reform institutions.

The paper is organized as follows: The next section develops a framework from which different types of institutions are evaluated. This framework draws from Rodrik (2005), but is still generally consistent with a Northian institutional definition. Section 3 discusses the empirical methodology used in this paper. Section 4 discusses the data and variables used in the empirical analysis. Section 5 analyzes and discusses the estimation results. Concluding remarks are offered in section 6.

2. The Institutional Framework

To credibly untangle institutions it is necessary to adopt a framework that accurately reflects the different channels through which different types of institutions can impact growth. If these channels are not appropriately defined, empirical analysis will be unable to identify with any certainty the individual influence of any particular institutional type. To address these issues, this paper adopts the taxonomy of institutions proposed by Rodrik (2005). In creating this taxonomy, we considered institutions under a very broad definition where institutions constitute the prevailing rules of the game in society. This classification differentiates institutions on the grounds of their function in supporting, sustaining and growing market economies. Institutions are defined as market-creating, market-regulating, market-stabilizing and market-legitimizing. The rest of this section will discuss each of these institutional types, leaving issues around their measurement for the data section.

Market-creating institutions are those that allow agents within an economy to interact, transact, and produce goods and services in the knowledge that the economic profit from such activities will lie in their control. At the center of this definition is the idea that individual property rights, the credibility in the rule of law, and the enforceability of contracts are necessary for markets to function efficiently.⁴ Market-creating institutions, by allowing agents to have sufficient control over the economic returns of their actions, do not distort the incentives of such agents to accumulate, innovate and participate in the marketplace.⁵

Market-regulating institutions are rules, structures and arrangements that a society effectively enforces upon itself in response to situations where its markets are known to fail. These institutions effectively place rules upon the market so as to constrain the inefficiencies that are known to exist given market failures.⁶ Modern developed economies are inundated with market regulating institutions. In New Zealand, an example is the role that the Commerce Commission plays in promoting competition and in prohibiting any misleading and deceptive conduct by traders.

Market-stabilizing institutions build resilience towards macroeconomic shocks, reduces inflationary pressure, and helps avert financial crisis. In theory these institutions could take a number of forms, from a central bank targeting inflation, being proactive in a financial crisis, or acting as a lender of the last resort. Equally, a government that has self-enforced legislation binding its fiscal actions could be an example of such an institution. From a societal perspective, the decision to create an active and independent monetary authority, sanctioned in its control of interest rates and inflation (and its implicit tax on savings), could be seen as being a collective and “humanly devised” constraint imposed by society, which would then constitute an institution. Similarly, fiscal constraint on the behalf of governments could be interpreted under the same light. Large deficits can be seen as a burden on future generations on which constraints can be placed.⁷ Market stabilizing institutions feed into growth via numerous channels. For example, they reduce uncertainty and encourage investment and other productive

⁴Rodrik (2005) makes the important point that legal property rights over the assets used in production are not sufficient, nor necessary, for markets to work efficiently. It is the control over the assets and the economic profit that is important. Town and village enterprises (TVE) are given as an example of no legally defined property rights, but functioning control rights.

⁵The channels via which market creating institutions influence economic growth can be traced to, reducing transaction costs, encouraging innovation and allowing complex economic interactions that, for example, may involve no personal interface.

⁶Examples of these failures could be; asymmetric or incomplete information, non-competitive markets and externalities.

⁷In New Zealand the Fiscal Responsibilities Act 1994 requires the government to follow a legislated set of principles and publicly assess their fiscal policies against these principles. Any departure from these principals must be publicly announced with an explanation of the deviation.

long-term behaviors.

Market-legitimizing institutions reduce the potential for coordination failure among different factions within an economy. They rearrange the costs and benefits that such factions implicitly face when deciding on the optimal strategy to achieve their goals. Market-legitimizing institutions help the eventual outcome in these situations to become closer to being socially optimal. For example, in a country where there are no democratic institutions, civil war and rebellion are the main mechanisms via which competing factions in an economy compete for their desired outcomes. In this situation the payoffs for undertaking a rebellion are too high. This is far from socially optimal given the resources wasted and uncertainty created in such environments. A market legitimizing institution, such as the existence of a democratic framework, allows these conflicts to be managed under a less destructive and a more socially accepted manner.⁸ Market legitimizing institutions can also be interpreted as those that insure individuals against individual-specific idiosyncratic risks. In a market economy characterized by dynamism, institutions of social insurance legitimize a market economy by making it compatible with social stability and cohesion.

While the framework described above, and followed throughout the remainder of this paper, focuses on the role of formal institutions, the importance of informal institutions cannot be overemphasized. Furthermore, informal institutions should not be analysed too narrowly, and should encompass a number of related concepts, for example social capital.⁹ Informal institutions can influence growth via many of the same mechanisms as formal institutions, and should thus ideally be included in this paper's analysis.¹⁰ Although there have been some attempts in the literature to link informal institutions (loosely defined) with growth, such institutions are difficult to identify and measure, and given the panel data approach of this paper, a suitable dataset could not be found. This omission places some limitations on this paper's results, but the empirical techniques used should purge some of the bias that would result from being unable to measure informal institutions.

3. Empirical Methodology

This paper employs a dynamic panel structure to isolate the effects of different types of institutions on long-run economic growth. Previous cross-sectional studies suffer from bias induced by unobserved time-invariant country-specific effects, as well as validity of instruments. Hence instrumental variable approach is not preferred.¹¹

3.1. Estimation Technique

This paper uses the system GMM estimator developed by Arellano and Bover (1995) and Blundell-Bond (1998).¹² The estimator is efficient in dynamic setting with a panel constructed of a small number time periods and a large number of cross-sections. These data dimensions are consistent with this paper's panel of six time periods and 105 countries. We begin with a reduced-form growth regression

⁸It helps to think of a democratic society as placing effective constraints on itself in how it can deal with social conflict between different factions within society. The existence of a constitution that is based in part on fundamental human rights might be an example.

⁹Helmke and Levitsky (2004) develop a framework for studying informal institutions and define such institutions as socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels.

¹⁰For example, reducing transactions costs and effectively resolving conflict.

¹¹See Bhattacharyya (2009) for more discussion on the issues of instrumental variable approach in this context.

¹²We also estimate our specifications by OLS and fixed effects for the sake of comparison. However, we do not report those results in the main tables.

$$y_{it} = \alpha y_{it-1} + \beta' X_{it} + \mu_t + \eta_i + \epsilon_{it} \quad (1)$$

First-differencing the model to expunge time invariant factors and rearranging yields

$$\Delta y_{it} = \alpha \Delta y_{it-1} + \beta' \Delta X_{it} + \Delta \epsilon_{it} \quad (2)$$

Since the fixed effects estimators in a dynamic panel setting are biased, as a solution, one transforms the model by either first differencing or taking forward orthogonal deviations (FOD) and then estimate the model.¹³ To be comparable with the literature this paper will use the first-difference transformation, but will supplement these results with the FOD transformation.¹⁴ As a result of the transformation in (2), the term $\Delta \epsilon_{it}$ is correlated with the term Δy_{it-1} . Instrumental variables consisting of observations twice the lag of the endogenous variable (and deeper) are needed to resolve this endogeneity. Considering the assumption of weak exogeneity and no serial correlation in the error term, the moment conditions for this dynamic GMM are

$$E[y_{it-2}(\epsilon_{it} - \epsilon_{it-1})] = 0, \forall t > 3 \quad (3)$$

$$E[X_{it-2}(\epsilon_{it} - \epsilon_{it-1})] = 0, \forall t > 3 \quad (4)$$

which yield consistent estimates of α and β' as the number of cross-sections approach infinity while the number of time periods is fixed.

By creating a system built on the regression in both levels and differences whilst simultaneously making the additional assumption that past changes in the dependent variable are uncorrelated with the current error term, not only can the lagged levels be used as differences, but the lagged first differences can be used as instruments for levels which yields additional moment conditions. This assumption guarantees that the new instruments for the level equation satisfy the traditional instrumental variable properties.¹⁵ With respect to growth regressions, the implication of the additional assumption made in system GMM identification should be interpreted in a more specific light. It can be seen as constraining the possibility that any deviation in a country's initial GDP level from its long-run trend should not be systematically related to its fixed effects (Durlauf et al. 2005). The moment conditions for the levels regression within system GMM are:

$$E[(y_{it-1} - y_{it-2})(\eta_i + \epsilon_{it} - \epsilon_{it-1})] = 0, \forall t > 3 \quad (5)$$

$$E[(X_{it-1} - X_{it-2})(\eta_i + \epsilon_{it} - \epsilon_{it-1})] = 0, \forall t > 3 \quad (6)$$

This paper uses the two-step system GMM estimator with the Windmeijer (2005) correction for small sample standard errors. Because of the large number of explanatory variables used in this study, the appropriate number of lags to be used as instruments is limited to two lags for

¹³The FOD transformation subtracts the average of all future available observations from a variable (see Roodman 2009a).

¹⁴Recent Monte Carlo results (Hayakawa 2009) indicate that forward orthogonal deviations (FOD), as opposed to first differencing, generally performs better. FOD also limits lost information when observations are missing. The transformation with FOD is as follows: $y_{it} - \sqrt{\frac{T_{it}}{(T_{it}+1)}} \left(y_{it} - \frac{1}{T_{it}} \sum_{s>t} y_{is} \right) = y_{it-1} - \sqrt{\frac{T_{it-1}}{(T_{it-1}+1)}} \left(y_{it-1} - \frac{1}{T_{it-1}} \sum_{s>t} y_{is} \right) + \beta' \left(X_{it} - \sqrt{\frac{T_{it}}{(T_{it}+1)}} \left(X_{it} - \frac{1}{T_{it}} \sum_{s>t} X_{is} \right) \right) + \epsilon_{it} X_{it} - \sqrt{\frac{T_{it}}{(T_{it}+1)}} \left(\epsilon_{it} - \frac{1}{T_{it}} \sum_{s>t} \epsilon_{i,s} \right)$. Further information on the FOD transformation can be found in Arellano and Bover (1995) and Roodman (2009a).

¹⁵For more clarification on this issue, the readers are referred to Roodman (2009a, 2009b).

the endogenous variables and one lag for predetermined variables.¹⁶ For similar reasons, the instrument matrix is always collapsed where applicable.¹⁷ While it is possible in large samples that this leads to inefficiency, in the context of the bias induced by instruments over-fitting endogenous variables, the trade-off is justifiably made.

The value of any inference made by system GMM can only be considered within the context of the validity of its instruments. In this paper consideration is given to such validity by considering a number of tests. The Hansen test of over-identifying restrictions that examines the validity of the full set of instruments in both the level and difference equations is used. Furthermore, a second test that allows the validity of the additional instruments in the level equation as well as the stationarity assumptions underpinning them is used. Finally the test for autocorrelation in the idiosyncratic disturbance term is also employed. Such autocorrelation could invalidate instruments used in system GMM.¹⁸

3.2. Regression Specification

We consider the following reduced-form growth regression

$$y_{it} - y_{it-1} = (\alpha - 1) y_{it-1} + \theta' Z_{it} + \beta' X_{it} + \mu_t + \eta_i + \epsilon_{it} \quad (7)$$

where i and t represent the specific country and time period respectively; Z represents the institutions of which there are $j = 4$ types, namely market-creating, market-stabilizing, market-regulating and market-legitimizing institutions; y is the natural logarithm of the level of GDP per capita; X is a vector of control variables; μ_t is a time specific effect while η_i is a country-specific effect; and ϵ is the error term. This equation is the baseline model used to test the robustness of the general results predicted by the literature that argue “institutions matter”.

Our primary interest is understanding whether different types of institutions matter differently for countries at different stages of development. Thus, the basic regression model in equation (8) is adjusted to include the interaction effects of the different institutional types over various income levels.

$$y_{it} - y_{it-1} = (\alpha - 1) y_{it-1} + \theta' Z_{it} + \gamma' Z_{it} I_{it} + \beta' X_{it} + \mu_t + \eta_i + \epsilon_{it} \quad (8)$$

where I_{it} denotes the different income categories, namely decile, quartile and median. If we find statistically significant differences across these dummy interactions, it would indicate that development-institutional interactions are important. This specification shows whether the level of income has an impact on the marginal effect that institutions have on growth. Significant interaction terms can be used to calculate the threshold effects which could yield some important policy implications.

The final estimation strategy considered is the stratification of the data into sub-populations, with income levels determining the sample parameters. In this approach we face similar issues when deciding the appropriate income thresholds as in the dummy-variable interaction approach. Due to the limited number of degrees of freedom available when stratifying data, the ability to test sub-populations in this paper is limited. As such we are limited to using either the thirty-third percentiles or the median as our cut-off values. The equation specification is

¹⁶The growth literature has so far been poor in facilitating a transparent dialogue often failing to note the specific instrumenting techniques employed. This is an important issue as the replication of results is neigh impossible without clear record of the processes followed and decisions made.

¹⁷For details on the use of the “collapse” function, please see Roodman (2009a, 2009b).

¹⁸Bazzi and Clemens (2013) argue that the system GMM suffers from weak instruments. However, Soto (2009) gives some support for system GMM especially when the underlying variable is persistent. He finds that it performs well compared to other estimators that deal with similar data sizes.

$$y_{bit} - y_{bit-1} = (\alpha - 1) y_{bit-1} + \theta' Z_{bit} + \gamma' Z_{bit} I_{bit} + \beta' X_{bit} + \mu_t + \eta_{bi} + \epsilon_{bit} \quad (9)$$

where b indicates an individual sub-sample from a given set. All other variables and parameters are as previously defined, but are specific for each sub-sample.

4. Data Issues

One of the empirical challenges in unbundling and uncovering the impact of institutions on growth is finding data that appropriately measure the different institutions. This section discusses the measurement of the variables used in growth regressions. There exists a literature discussing the validity of the measurement of institutions and governance variables. In this study much thought was given to the, often contradictory, arguments in this literature, even if we have no room to analyze it here.¹⁹ Many authors have highlighted the problems with using perceptive based measures.²⁰ Moreover, in terms of having access to variables that can cover the time span needed for panel data analysis, outcome based measures are superior. These measures are preferred when compared to the often used political instability proxies.

Market Creating Institutions - To measure market creating institutions we use “Rule of Law” and “Investment Profile” from the International Country Risk Guide (ICRG) database. The Rule of Law measures the degree to which persons within a country are happy to accept the established institutions to make and adjudicate disputes. Higher scores indicate a sound and strong court system. Lower scores indicate a tradition of depending on physical force or illegal means to settle claims. Investment Profile, which is assessment of factors affecting the risk to investment, is also used as a candidate to measure market-creating institutions.

Market Stabilizing Institutions - To measure market stabilizing institutions, we use two proxies: the adjusted logged average inflation rate over the period and the four year inflation volatility. These are not direct measures of market-stabilizing institutions, but we argue that they are acceptable proxies. They directly measure the performance of these institutions.

Market Regulating Institutions - Finding a time series variable for market-regulating institutions is a difficult task. We use the regulation component of the index of economic freedom which is the only variable available that can cover the time series dimension needed for this analysis.

Market Legitimizing Institutions - To measure market legitimizing institutions we employ the “Democracy” variable from the Polity IV dataset. It measures, among other things, how well the existence of political institutions and procedures allow citizens to express their preferences about the leaders of their country.²¹ The second measure we employ is the political rights variable from the Freedom House dataset.

All other data in our paper come from various sources including the World Bank’s World Development Indicators (WDI), World Bank’s Financial Development and Structure Database, and the IMF’s International Financial Statistics (IFS). The dependent variable in our regressions is the 4-year growth rates of real GDP per capita. The main control variables used in the regressions are human capital, trade openness, gross fixed capital formation as a percentage of GDP, population levels, foreign direct investment (FDI) as a percentage of GDP, and general

¹⁹We would point any interested reader to the specific interchange between Kurtz and Schrank (2007a,b) and Kaufmann et al. (2007a,b) as a good place to start.

²⁰See Kurtz and Shrank (2007a,b) and Glaeser et al (2004).

²¹The Polity IV dataset covers all major, independent states in the global system over the period 1800-2013 for 167 countries. The “Democracy” variable is created from the “Polity Score” variable that captures the regime authority spectrum on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). For further details, see <http://www.systemicpeace.org/polityproject.html>.

government final consumption as percentage of GDP.²² As robustness checks, we also use variables such as credit to the private sector, liquid liabilities to the financial sector and the ratio of commercial bank assets to the sum of commercial bank and central bank assets.²³ The other financial variable used is the de jure Chinn-Ito capital account openness variable.²⁴

Our data spans from 1985 to 2008 for a panel of 105 countries. To maintain comparability with the previous literature, each country contains six non-overlapping observations created by taking four yearly averages. The summary statistics of the main variables are shown in Table 1. Pairwise correlations in Table 2 give the first overview of the correlation between the variables in our regression. Table 3 provides a list of countries in the data and also offers information on their geographic region and current income group.

5. Estimation Results

Before examining the results of the various model specifications and considering what useful inferences one can extract from them, it is worth considering the limits that are implicitly assumed when examining the growth impacts of institutions in these models. It is often difficult to give concrete inferences based on models that employ variables that are quasi-ordinal in nature and which often fail to have a clear unit of measurement. In fact, there seems to be a fraction of the literature that shies away from a rigorous quantitative interpretation of regression coefficients, and instead simply comment on the sign and significance of coefficients. This paper accepts why this lack of interpretation may exist, but will argue that there are alternative strategies. Non-concrete units of measurement in the data stop direct comparisons from being completely valid. In our dataset, for example, it is difficult to quantify and envisage what a one point change in an ICRG risk index actually means. However, relative comparisons are still possible. Comparing two countries with an ICRG risk index change should still remain valid. In the results below, this paper attempts to give interpretations of growth impacts in terms of relative comparisons.

5.1. Institutions and Development

Our starting point is to check which institutions, if any, matter for economic growth.²⁵ The first task of this paper is to investigate this question within a credible and transparent environment. We present these results in Table 4. Across a number of specifications, and controlling for numerous different covariates (population growth, corruption, foreign direct investment, credit to the private sector and capital account openness), evidence is found that market-creating institutions and market-stabilizing institutions matter for economic growth. To a weaker degree we find that market-legitimizing institutions also have a role in the growth process. We also confirm that human capital is a strong indicator for growth.

The models presented in Table 4 pass almost all tests of instrument validity at conventional levels of significance.²⁶ We find that a one standard deviation increase in law & order

²²We have selected the main control variables based on the literature. For example, see the recent work by Bhattacharyya (2009).

²³We have added additional control variables for robustness checks based on previous literature. See Mauro (1995), Levine et al. (2000) and Bekaert et al. (2005) among others.

²⁴The Chinn-Ito data can be accessed at http://web.pdx.edu/~ito/Chinn-Ito_website.htm.

²⁵This specification is similar in spirit to Bhattacharyya (2009). However, a number of important pieces of information such as the instrument count, whether time dummies were included in estimation, and other important identification tests were not published by the author. Furthermore, second order serial correlation in the errors, which would invalidate the results of instrumental identification, seems to be prevalent within a number of his specifications.

²⁶Whilst a couple of models in Table 4 are too close to rejecting the null hypothesis of second-order autocorrelation in the error terms, they are in the minority.

(market-creating) and democracy (market-legitimizing) increase annual growth rates by 1.499 percent and 1.087 percent respectively. While the use of standard deviations is technically not appropriate for examining law & order and democracy, it gives a non-arbitrary basis for a relative comparison. Such institutional changes are generally equivalent to current day Romania improving their law & order index to that of Portugal and Malaysia moving to a democracy score of South Korea. We also find that a one standard deviation increase in years of secondary schooling (human capital) increase annual growth rates by 1.529 percent. This is equivalent to current day Mauritius increasing their average years of secondary school above the age of 15 from an average of 2.63 years to that to current day Greece with 3.39 years.²⁷ The impact of market-stabilizing institutions (measured by the volatility of inflation), when scaled, is generally comparable to the results of Aghion et al. (2009). We also find that an increase in 10 percent inflation volatility reduces the annual growth rate by 0.1 percent. Economically this is equivalent to New Zealand’s average inflation volatility over the last twenty years increasing to that of more volatile Iran. The robustness of these results was further checked by employing different measures of human capital and by using slightly different lag structures when instrumenting for the endogenous variables. These results and general conclusions still remain valid.²⁸

Having provided some evidence that certain types of institutions are important for economic growth, we now examine the main question of this study. Are the impacts of different type of institutions on economic growth dependent on the level of development of a country? As an initial exercise, we interact institutional variables with the level of development of a country. We proxy the development level of a country based on their income levels. We interact the institutional variables with the income divisions for deciles, quartiles and the median. Each interaction term indicates how much a particular institution is contributing to growth for a specific income level. Table 5 report the results of these estimations for the deciles and Table 6 provides the results for the median cut-off. In Tables 5 and 6 each type of institution is proxied by multiple measures, except for market regulating institutions. Across all the specifications it is a rarity that the instruments can be declared invalid via the Hansen test.²⁹ Thus we have some confidence that our instruments are properly identified.

On average the coefficient magnitudes of all the variables in Table 5 are consistent with the previous set of regressions in Table 4. Again, both law & order and total years of schooling are shown to have a strong impact on growth. The interaction terms in the decile regressions indicate that there are statistically significant differences in the slope parameters between developed and non-developed countries for market creating and market regulating institutions. Across almost all institutions at some stage evidence exists of an interaction. However, these results do not hold strongly across all categories. Further investigation is definitely justified. Overall, the results indicate that there is some evidence of the level of development of a country interacting with the institutional change.

One can argue that the decile groupings are likely to be sensitive to the outliers; hence the estimations of the interaction effects between institutional type and a country’s level of development could be biased. To analyze the robustness of the results in Table 5, we also consider regressions with two broader classifications: median and quartile interactions. Table 6 provide results from a number of different model specifications with median interactions.³⁰

²⁷These are quite significant changes for those unfamiliar with these countries.

²⁸These results are omitted from the paper to conserve space but are available upon request.

²⁹The only exception was the coefficient of the market creating institution in the quartile regressions which is not reported here.

³⁰The results with the quartile interactions are qualitatively similar to that of Table 6. These are not reported in the paper but are available upon request.

Each regression is run for institutional type with slightly different lag structures and covariates. We find some interaction terms to be significant. Once again, the interaction term for market creating institutions is positive and significant for the lower median income countries. Both market-stabilizing institutions and market-regulating institutions also appear to have a diminishing impact on growth as incomes rise.

In Figure 1, we demonstrate the partial effects of Law & Order, Investment Profile and Regulation to show the marginal impact of each of these institutions on growth. For each level of income, we plot the marginal impact that each of the institutions have on growth. We refer to the level of income as “threshold income” when, after that level, the marginal impact contributes to a negative growth. We find that Law & Order has a marginal impact that remains positive until a threshold income of around \$9,500, while regulation does not hit its threshold until around \$11,000. The rate at which Investment Profile approaches its threshold is much slower, although this term is not significant in a large enough number of specifications to be taken seriously. These interactions could have important policy implications. A country could use such information to optimize the direction of a reform agenda. However, the interaction terms evaluated here should be seen as more indicative than absolute. It is unlikely that a country would have negative growth as a result of improving their regulation, which is what would be implied if they have an income greater than \$10,000.

To summarize, when the regressions are evaluated in conjunction with the alternative cut-off points of development groups in the previous tables, the conclusions reached seems robust. The re-occurring theme is that of market-creating institutions play an important role in fostering growth. Market-stabilizing institutions and human capital also consistently appear to be significant. The interaction effects of market creating institutions and market stabilizing institutions seem to be strong and significant for the lower decile (poor) countries.

5.2. Sub-sample Analysis

One of the main issues with system GMM, and in fact the majority of panel estimators, is the fact that parameter homogeneity is often assumed or imposed. When dealing with institutions and growth it is arguable as to why one would expect countries of vastly different levels of wealth and institutional development to grow similarly in response to the same stimulus. While approaches taken in the above sections allow an individual institution to differ across different levels of development, any further heterogeneity across other variable coefficients is restricted. To address this issue, sub-samples based on the level of development within a country are taken from the full set of 105 countries. While a significant constraint on the degrees of freedom available in estimation is tautologically imposed, there are definite benefits of estimation with sub-samples that are more homogenous.

As the system GMM is realistically bounded by its instrument count, and its asymptotic properties are based on a large N , sub-sampling can offer the researcher additional challenges in providing convincing results. To address this issue we use the collapse function to limit the instrument count. Furthermore we only use the thirty-third percentile in grouping the countries so as to keep the number of countries at a reasonable level. Minimizing the instrument set while still controlling for the endogeneity of the covariates is a difficult task.³¹ Nevertheless in only one regression out of all specifications do we break the informal rule in the system GMM literature stating that the number of instruments employed should not exceed the number of cross-sections.³²

Table 7 present results from the sub-sample analysis. OLS, fixed effects and system GMM

³¹And thus limiting the well-known problem of instruments over-fitting endogenous variables.

³²This informal rule is definitely an upper bound. To have results taken credibly the instrument count should really be somewhat lower than the number of cross sectional units.

are applied to three sub-samples determined on the basis of their income levels. The system GMM coefficients are almost unanimously significant and have signs consistent with those throughout the rest of this paper. Estimates with OLS and fixed effects are presented for comparison. From our previous analysis one would expect that market-creating institutions will have a larger and more significant coefficient for poor countries than for middle or high income ones. This appears to be the case. The coefficient from the system GMM regression for the poor income cohort is larger in magnitude as well as significant at the five percent level. A one standard deviation increase in the law and order variable for the poor cohort increases the growth rate by 1.6 percentage points, holding all else constant. This represents moving from a country with market creating institutions like that of current day Bolivia to that of Egypt.

Table 8 builds on the system GMM regressions of Table 7, offering sensitivity analysis for each of the three income levels. The general specification is expanded by including additional covariates of investment profile, inflation volatility and foreign direct investment. All the regressions in Table 8 appear to contain valid instruments. At no stage can the null hypothesis of the Hansen test be rejected. Furthermore, at conventional significance levels it appears that none of the models suffer from second order autocorrelation in the error terms. This supports the belief that this form of serial correlation will not invalidate the instruments used in the system GMM specification.

The conclusion from Table 8 is that poor countries, defined as being in the bottom one third of income levels, have a significant opportunity to benefit and grow from improving certain aspects of their institutional framework. Across all models in Table 8, market-creating institutions appear to have a statistically significant impact on growth. The magnitudes of such impacts are reasonably similar to those that are reported in Table 7. As one moves across the columns of the table into the middle and high income groups, the impact that market-creating institutions can have on growth seems to diminish. At the ten percent significance level there is some evidence that market creating institutions can impact on middle income countries, but when one considers the highest income group none of the coefficients are significant.

Poor countries also appear to have the largest potential to benefit from market-stabilizing institutions. When measured by both average inflation and inflation volatility, significant improvements in growth would be expected if these institutions were to improve. A somewhat worrying result from these models is the coefficient of inflation and inflation volatility for the high income countries. The coefficients are statistically significant and positive which is somewhat against what one would expect. However, there are other studies in the literature who have found similar puzzling results when dealing with sub-sampling.

An interesting result from these regressions is that it appears that once a country reaches a certain wealth level, market legitimizing institutions appear to become statistically significant with a positive coefficient. It implies that market legitimizing institutions, in this case measured by democracy, are not necessarily optimal for growth at low levels of income. However, these are important for the richer countries. An improvement in this institution has a strong influence on economic growth for these countries.

We also conduct additional robustness checks. We run the same regressions by excluding the OPEC countries. The results did not change by much. We also ran the regressions by excluding other outlier countries such as Zimbabwe and Congo due to hyper-inflation. Once again, no significant change was found in the results. As robustness checks, we include additional controls such as investment, population growth, primary and secondary schooling, capital account openness, human rights and government stability and re-run the same specifications for the poor country sub-sample. The results are very similar to Table 8. We find robust relationship that market-creating and market-stabilizing institutions are much more important for

these countries compared to market-legitimizing or market-regulating institutions.³³ These results have potentially important policy implications. Promoting institutions that fit under the market-creating and market-stabilizing definition seems to be the most potent avenue in terms of institutional reform for attaining growth in less developed countries. A further paper might examine the policy implications of these findings and offer a more comprehensive evaluation of where it stands in relation to the rest of the growth literature.

6. Conclusion

One strand of the empirical literature examining the growth impacts of institutions has arrived at the consensus that institutions have an important role to play in fostering economic growth. However, much of the previous research has treated institutions either in isolation, or as a summary variable aggregating an entire array of often subtly different institutional types. By building a framework around the institutional taxonomy proposed by Rodrik (2005), and applying it to a dynamic panel data model, we make a number of additions to the literature. First, we provide institutionally disaggregated evidence that institutions matter. We find that market-creating institutions have a very significant role in the promotion of economic growth. We also find that market-stabilizing institutions and human capital have an impact on growth.

We then extend the empirical literature on institutions by considering whether countries at different levels of development could respond heterogeneously to changes in their institutional structure. Although not all of the empirical tests confirmed that a strong and significant interaction existed for all types of institutions, we did find that market-creating and market-stabilizing institutions are much more important for the lower income countries. This result was robust to different decile, quartile and median income level interactions. When the data were broken up into sub-populations, evidence emerged that confirmed the idea that economic growth response did depend on the level of development within a country. Specifically we found that market-creating institutions, measured by the ICRG variables Law and Order or Investment Profile had a significant impact on growth for poor countries. We also found evidence, albeit slightly weaker, that market-stabilizing institutions could also positively impact economic growth. While the majority of the significant inferences came from the poor income cohort, there was also evidence that for richer countries, market-legitimizing institutions such as the strength of the democratic institutions within a country could have a significant impact on economic growth. At the same time, we also find some evidence that democratic institutions are not necessarily optimal for growth for poor countries. These results have important implications for countries that decide on the optimal strategy to improve their institutional framework. Countries should carefully plan their strategies to minimize the risk of unintended negative consequences.

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Figure 1: Marginal Impact of Institutions

Table 1: Summary Statistics

	Observations	Mean	Standard Dev	Minimum	Maximum
Initial GDP	545	5892.56	7649.078	143.8486	33191.91
Total Primary School Over 15	545	4.549473	1.561153	0.635	8.8344
Total School Secondary Over 15	545	2.295738	1.278119	0.1277	7.4676
Total School Secondary Over 25	545	2.120006	1.320459	0.0713	7.773
Population Growth	545	0.0480739	0.0376672	-0.052176	0.199989
Trade (% GDP)	545	73.52259	37.27612	12.94341	208.2839
Government Consumption (% GDP)	545	15.44217	5.378097	4.154685	36.26613
FDI (% GDP)	537	2.274853	3.296548	-15.04079	31.78543
Investment (% GDP)	541	20.90002	5.83483	2.250709	43.11432
Capital Account Openness	531	0.4077482	1.577982	-1.811621	2.531836
Corruption	545	4.239596	1.390091	1	7
Law and Order	545	3.767252	1.456812	0.105	6
Investment Profile	545	7.425165	2.333448	1.1875	12
Democracy	545	6.153211	3.813303	0	10
Political Rights	545	2.995719	1.954962	1	7
Regulation	545	5.703687	1.053822	2.72549	8.754202
Liquid Liabilities	481	0.4980191	0.3167954	0.0450278	2.235421
Inflation Volatility	542	82.58074	710.2425	0.1329923	13166.08
Risk Budget Balance	545	5.80706	1.541413	1.3975	10
Human Rights	542	6.810578	2.794687	0	10

Table 2: Correlation Matrix

	GDP	Law	InvPro	CivLib	Regu	InfVol	Inf	Risk	Democ	PolR	SecSch	TotSch	GovCon	Trade
GDP	1													
Law	0.6721	1												
InvPro	0.4592	0.4412	1											
CivLib	-0.6081	-0.5448	-0.5108	1										
Regu	0.4707	0.4007	0.5355	-0.5405	1									
InfVol	-0.0726	-0.1208	-0.1572	0.0366	-0.1427	1								
Inf	-0.1991	-0.2463	-0.3225	0.1615	-0.349	0.5182	1							
Risk	0.398	0.3942	0.737	-0.3629	0.4429	-0.1683	-0.3082	1						
Democ	0.5134	0.4434	0.4284	-0.8738	0.4418	-0.0015	-0.1009	0.2825	1					
PolR	-0.5322	-0.467	-0.4376	0.9307	-0.4697	0.0185	0.116	-0.2608	-0.9259	1				
SecSch	0.4673	0.5101	0.471	-0.6335	0.4408	-0.0557	-0.138	0.3829	0.6215	-0.5905	1			
TotSch	0.635	0.5947	0.5367	-0.6719	0.5196	-0.0516	-0.1692	0.4599	0.6288	-0.6084	0.9043	1		
GovCon	0.4354	0.4569	0.2366	-0.3299	0.2042	-0.0054	-0.045	0.1233	0.2338	-0.2791	0.3148	0.3951	1	
Trade	0.0175	0.1516	0.2933	-0.1252	0.2834	-0.0899	-0.2014	0.2449	0.0202	-0.0419	0.2792	0.2599	0.2528	1

Table 3: List of Countries

Country	Income Group	33rd Percentile	Country	Income Group	33rd Percentile
Albania	Lower middle	2	Latvia	Upper middle	2
Algeria	Upper middle	2	Lithuania	Upper middle	2
Argentina	Upper middle	3	Malawi	Low	1
Armenia	Lower middle	1	Malaysia	Upper middle	2
Australia	High	3	Mali	Low	1
Austria	High	3	Mexico	Upper middle	3
Bahrain	High	3	Moldova	Lower middle	1
Bangladesh	Low	1	Mongolia	Lower middle	1
Belgium	High	3	Morocco	Lower middle	1
Bolivia	Lower middle	1	Mozambique	Low	1
Botswana	Upper middle	2	Namibia	Upper middle	2
Brazil	Upper middle	2	Netherlands	High	3
Bulgaria	Upper middle	2	New Zealand	High	3
Cameroon	Lower middle	1	Nicaragua	Lower middle	1
Canada	High	3	Niger	Low	1
Chile	Upper middle	2	Norway	High	3
China	Lower middle	1	Pakistan	Lower middle	1
Colombia	Upper middle	2	Panama	Upper middle	2
Congo, Dem. Rep.	Low	1	Papua New Guinea	Lower middle	1
Congo, Rep.	Lower middle	2	Paraguay	Lower middle	2
Costa Rica	Upper middle	2	Peru	Upper middle	2
Cote d'Ivoire	Lower middle	1	Philippines	Lower middle	1
Croatia	High	3	Poland	Upper middle	2
Cyprus	High	3	Portugal	High	3
Czech Republic	High	3	Romania	Upper middle	2
Denmark	High	3	Russian Federation	Upper middle	2
Dominican Republic	Upper middle	2	Senegal	Low	1
Ecuador	Lower middle	2	Sierra Leone	Low	1
Egypt, Arab Rep.	Lower middle	1	Slovak Republic	High	2
El Salvador	Lower middle	2	Slovenia	High	3
Estonia	High	2	South Africa	Upper middle	2
Finland	High	3	Spain	High	3
France	High	3	Sri Lanka	Lower middle	1
Gabon	Upper middle	3	Sweden	High	3
Germany	High	3	Switzerland	High	3
Ghana	Low	1	Syrian Arab Republic	Lower middle	1
Greece	High	3	Tanzania	Low	1
Guatemala	Lower middle	2	Thailand	Lower middle	1
Guyana	Lower middle	1	Togo	Low	1
Honduras	Lower middle	1	Trinidad and Tobago	High	3
Hungary	High	2	Tunisia	Lower middle	2
India	Lower middle	1	Turkey	Upper middle	2
Indonesia	Lower middle	1	Uganda	Low	1
Iran, Islamic Rep.	Lower middle	2	Ukraine	Lower middle	2
Ireland	High	3	United Arab Emirates	High	3
Israel	High	3	United Kingdom	High	3
Italy	High	3	United States	High	3
Japan	High	3	Uruguay	Upper middle	2
Jordan	Lower middle	2	Venezuela, RB	Upper middle	2
Kazakhstan	Upper middle	2	Vietnam	Low	1
Kenya	Low	1	Zambia	Low	1
Korea, Rep.	High	2	Zimbabwe	Low	1

Table 4: Institutions and Growth

	(1)	(2)	(3)	(4)	(5)	(6)
Law and Order (MC)	0.0732*** (0.015)	0.0590*** (0.015)	0.0534*** (0.017)	0.0492** (0.021)	0.0753*** (0.013)	0.0604*** (0.016)
Regulation (MR)	0.0298 (0.033)	-0.0104 (0.036)	-0.0030 (0.037)	-0.0091 (0.039)	0.0276 (0.029)	0.0180 (0.036)
Inflation Volatility (MS)	-0.0001 (0.000)	-0.0001*** (0.000)	-0.0001* (0.000)	-0.0001*** (0.000)	-0.0002 (0.000)	-0.0000 (0.000)
Democracy (ML)	0.0122* (0.007)	0.0089 (0.007)	0.0098 (0.007)	0.0098 (0.007)	0.0169*** (0.006)	0.0159** (0.006)
Income (T-5)	0.9221*** (0.024)	0.9339*** (0.020)	0.9143*** (0.023)	0.9328*** (0.021)	0.9329*** (0.019)	0.9156*** (0.023)
Schooling	0.0388 (0.025)	0.0648*** (0.025)	0.0723*** (0.026)	0.0642*** (0.025)	0.0454*** (0.017)	0.0717** (0.030)
Trade Openness	0.0015 (0.021)	-0.0025 (0.019)	-0.0037 (0.020)	-0.0156 (0.026)	0.0083 (0.022)	-0.0116 (0.024)
Population Growth		0.4632 (0.808)				
Corruption			0.0221 (0.021)			
FDI				0.0063 (0.008)		
Private Credit (% GDP)					-0.0502* (0.029)	
Capital A/C Openness						0.0106 (0.012)
Constant	0.0503 (0.187)	0.2504 (0.178)	0.2979 (0.199)	0.3086 (0.247)	-0.1466 (0.215)	0.7906*** (0.222)
Observations	450	461	461	456	424	461
Countries	105	105	105	104	99	105
Instruments	27	24	27	27	27	24
1st order AC test	0.00178	0.1395	0.1434	0.1438	0.006516	0.003330
2nd order AC test	0.1589	0.9779	0.9520	0.8585	0.09999	0.1580
Hansen Test	0.8027	0.8823	0.7989	0.5524	0.7772	0.8313
Sargan Test	0.7920	0.8554	0.7479	0.7931	0.1584	0.2684

Estimation Method: Two-step System GMM (Arellano and Bover (1995), Blundell Bond (1998)).

Time dummies are included in the estimation but not reported.

Windmeijer (2005) finite sample corrected standard errors are reported in parentheses.

***, ** and * represent statistical significance at 1%, 5% and 10% levels respectively.

p-values for the tests in the bottom panel are reported.

Table 5: Institutions and Growth: Unbundled Categories (Decile Interactions)

	Mkt Creating		Mkt Regulating	Mkt Stabilizing		Mkt Legitimizing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Law and Order	Investment Profile	Regulations	Inflation Volatility	Inflation	Political Rights	Democracy
Income (T-5)	0.9512*** (0.049)	0.9180*** (0.037)	0.9406*** (0.053)	0.8215*** (0.041)	0.9678*** (0.061)	0.9711*** (0.052)	0.9535*** (0.051)
$\log(IniIncome)$	0.0444 (0.078)	0.0252 (0.038)	0.0199 (0.081)	0.0666 (0.047)	-0.0276 (0.156)	-0.0477 (0.082)	-0.0570 (0.066)
Schooling	0.0529* (0.030)	0.0894*** (0.030)	0.0692** (0.029)	0.0760*** (0.025)	0.0864*** (0.033)	0.1114* (0.058)	0.0944*** (0.036)
Trade Openness	0.0173 (0.065)	-0.0054 (0.059)	0.0184 (0.060)	-0.0480 (0.053)	-0.0288 (0.063)	0.0029 (0.081)	-0.0099 (0.065)
Govt Cons	-0.2031*** (0.072)	-0.1799*** (0.057)	-0.1589** (0.071)	-0.0222 (0.056)	-0.0994 (0.070)	-0.1636** (0.075)	-0.2464*** (0.073)
Interaction 1	0.1040*** (0.027)	0.0166 (0.013)	0.0395 (0.031)	-0.0000** (0.000)	-0.1373*** (0.036)	-0.0036 (0.029)	-0.0101 (0.009)
Interaction 2	0.1231*** (0.034)	0.0556*** (0.015)	0.0833** (0.041)	0.0000 (0.003)	-0.1684*** (0.040)	0.0108 (0.066)	0.0309*** (0.007)
Interaction 3	0.0549 (0.041)	0.0004 (0.011)	0.0051 (0.029)	-0.0015 (0.003)	-0.1976*** (0.059)	0.0021 (0.025)	-0.0012 (0.007)
Interaction 4	0.0620*** (0.016)	0.0209 (0.013)	0.0426** (0.021)	-0.0000 (0.000)	-0.1418*** (0.050)	0.0152 (0.049)	-0.0019 (0.010)
Interaction 5	0.0590*** (0.019)	0.0207** (0.010)	0.0516** (0.026)	-0.0009 (0.001)	-0.1627*** (0.056)	0.0278 (0.049)	0.0068 (0.008)
Interaction 6	0.0418 (0.030)	0.0155 (0.010)	0.0384 (0.024)	-0.0001 (0.000)	-0.1761** (0.072)	0.0077 (0.029)	0.0067 (0.011)
Interaction 7	0.0740* (0.039)	0.0129 (0.008)	0.0384* (0.023)	-0.0001** (0.000)	-0.1655* (0.098)	0.0090 (0.022)	0.0104 (0.011)
Interaction 8	0.0448 (0.037)	0.0182** (0.008)	0.0291 (0.029)	0.0002** (0.000)	-0.1549 (0.100)	-0.0686 (0.115)	0.0237** (0.010)
Interaction 9	0.0585 (0.039)	0.0081 (0.008)	0.0192 (0.023)	0.0169** (0.007)	-0.1850 (0.114)	-0.0100 (0.138)	0.0166 (0.013)
Interaction 10	0.0169 (0.048)	0.0108 (0.009)	0.0145 (0.025)	0.0018 (0.009)	-0.2087 (0.128)	0.0157 (0.039)	0.0055 (0.022)
Constant	1.2017** (0.541)	1.3806*** (0.515)	0.7902 (0.637)	0.3568 (0.336)	1.0728 (0.907)	1.6202*** (0.507)	1.8981*** (0.459)
Observations	461	461	461	461	461	476	461
Countries	105	105	105	105	105	108	105
Instruments	91	91	91	92	91	91	89
1st order AC test	0.004491	0.003369	0.003040	0.01226	0.005105	0.006906	0.004835
2nd order AC test	0.3371	0.4300	0.2937	0.5920	0.2893	0.2763	0.4355
Hansen Test	0.3670	0.5954	0.6083	0.1764	0.2141	0.6306	0.6452
Sargan Test	0.01725	0.05794	0.1558	3.355e-12	0.02116	0.001721	0.2370
Hansen-Diff	0.293	0.594	0.772	0.176	0.448	0.328	0.680

See Table 4 footnotes.

All regressions include the respective institutional variables in levels but the coefficients are not reported.

Table 6: Institutions and Growth: Unbundled Categories (Median Interactions)

	Mkt Creating		Mkt Regulating	Mkt Stabilizing		Mkt Legitimizing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Law and Order	Investment Profile	Regulations	Inflation Volatility	Inflation	Political Rights	Democracy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Income (T-5)	0.9807*** (0.053)	0.9218*** (0.067)	0.9327*** (0.068)	0.9714*** (0.059)	0.9589*** (0.057)	0.9726*** (0.064)	0.9498*** (0.056)
log (Initial Income)	-0.0613 (0.063)	-0.0112 (0.077)	-0.0160 (0.078)	-0.0734 (0.077)	-0.0201 (0.070)	-0.0344 (0.082)	-0.0844 (0.056)
Schooling	0.1326*** (0.028)	0.1507*** (0.033)	0.0908** (0.043)	0.1095*** (0.031)	0.1431*** (0.036)	0.1094*** (0.035)	0.1295*** (0.035)
Trade Openness	-0.0470 (0.077)	-0.0730 (0.076)	0.0736 (0.091)	-0.0338 (0.079)	-0.0659 (0.089)	-0.0384 (0.087)	-0.0046 (0.063)
Govt Consumption	-0.1874** (0.080)	-0.1677** (0.073)	-0.1754* (0.090)	-0.1613** (0.078)	-0.1767** (0.074)	-0.1860** (0.082)	-0.2302*** (0.074)
Lower Median	0.0454** (0.019)	0.0275** (0.013)	-0.0001 (0.000)	-0.2363*** (0.089)	0.0348 (0.039)	0.0056 (0.017)	0.0044 (0.006)
Upper Median	0.0328 (0.021)	0.0142 (0.009)	0.0000 (0.000)	-0.2193** (0.086)	0.0092 (0.037)	-0.0095 (0.034)	0.0215 (0.014)
Constant	1.8548** (0.795)	1.7860*** (0.687)	0.2265 (0.599)	2.1063*** (0.687)	1.5146** (0.661)	2.1261*** (0.815)	2.1555*** (0.529)
Observation	461	461	461	461	461	476	461
Countries	105	105	105	105	105	108	105
Instruments	33	33	33	33	33	33	33
1st order AC test	0.004812	0.006462	0.2033	0.006032	0.006805	0.009193	0.005831
2nd order AC test	0.2610	0.5267	0.5797	0.2343	0.3337	0.2750	0.3698
Hansen Test	0.5659	0.2359	0.3123	0.3451	0.8148	0.3897	0.8906
Sargan Test	0.05990	0.001532	0.1517	0.02668	0.3055	0.01382	0.1287
Hansen-Diff	0.566	0.115	0.3953	0.345	0.821	0.7247	0.0891

See Table 5 footnotes.

Table 7: Unbundled Institutions and Growth (Sub-sample Analysis)

	All			Poor			Medium			High		
	(1) OLS	(2) FE	(3) BB	(4) OLS	(5) FE	(6) BB	(7) OLS	(8) FE	(9) BB	(10) OLS	(11) FE	(12) BB
Income (T-5)	0.9988*** (0.023)	0.6229*** (0.054)	0.9649*** (0.053)	1.0574*** (0.033)	0.6859*** (0.075)	1.0458*** (0.071)	0.8864*** (0.029)	0.4358*** (0.060)	0.7832*** (0.106)	0.9491*** (0.050)	0.5574*** (0.155)	0.9549*** (0.129)
log (Initial Income)	-0.0348 (0.024)	0.0000 (.)	-0.0697 (0.055)	-0.0981*** (0.033)	0.0000 (.)	-0.1035 (0.074)	0.1011** (0.043)	0.0000 (.)	0.2184* (0.121)	0.0164 (0.049)	0.0000 (.)	0.0179 (0.124)
Schooling	0.0242*** (0.007)	0.0480** (0.024)	0.1320*** (0.034)	0.0486*** (0.013)	0.1878*** (0.059)	0.0576*** (0.020)	0.0380*** (0.010)	-0.0306 (0.046)	0.0579 (0.036)	-0.0027 (0.007)	-0.0088 (0.022)	0.0064 (0.033)
Trade Openness	0.0111 (0.010)	0.0323 (0.037)	-0.0154 (0.068)	-0.0088 (0.023)	0.0567 (0.066)	0.0479 (0.085)	-0.0476** (0.023)	-0.0098 (0.047)	0.0122 (0.104)	0.0171 (0.017)	-0.0584 (0.101)	-0.0031 (0.068)
Govt Consumption	-0.0487*** (0.015)	0.0121 (0.046)	-0.2129*** (0.077)	-0.0521* (0.027)	0.0177 (0.054)	-0.0676 (0.059)	-0.0541** (0.024)	-0.1002 (0.078)	-0.2216 (0.160)	-0.0124 (0.030)	-0.0000 (0.154)	-0.0011 (0.069)
Law and Order (MC)	0.0282*** (0.005)	0.0318*** (0.010)	0.0483*** (0.017)	0.0537*** (0.009)	0.0491*** (0.012)	0.0585** (0.025)	0.0310*** (0.009)	0.0239 (0.016)	0.0421 (0.039)	0.0289** (0.014)	0.0145 (0.027)	0.0215 (0.016)
Regulation (MR)	0.0053 (0.007)	0.0394*** (0.014)	0.0132 (0.037)	-0.0045 (0.015)	0.0385** (0.015)	0.0026 (0.039)	0.0456*** (0.014)	0.0645*** (0.019)	0.0781 (0.052)	-0.0011 (0.009)	-0.0243 (0.025)	-0.0257 (0.029)
Inflation (MS)	-0.0979*** (0.028)	-0.0100 (0.018)	-0.2285*** (0.061)	-0.1169*** (0.030)	-0.0175 (0.028)	-0.1930*** (0.062)	-0.0594* (0.031)	0.0227 (0.023)	-0.0889 (0.124)	0.4301 (0.264)	0.3432 (0.378)	0.9069* (0.517)
Democracy (ML)	0.0071*** (0.002)	0.0038 (0.003)	0.0096 (0.007)	0.0088*** (0.003)	0.0105** (0.005)	0.0043 (0.008)	0.0050 (0.004)	0.0078 (0.008)	0.0039 (0.017)	0.0091** (0.004)	0.0099 (0.011)	0.0160* (0.009)
Constant	0.6766*** (0.155)	2.4183*** (0.483)	1.9379*** (0.646)	0.8031*** (0.201)	1.1187** (0.441)	1.0020 (0.655)	0.2843 (0.295)	4.3601*** (0.471)	0.2851 (1.224)	-1.8202 (1.304)	3.1116 (3.277)	-3.9506 (2.613)
Observation	461	461	461	156	156	156	155	155	155	150	150	150
Countries		105	105	36	36	36		37	37		32	32
Instruments			30			30			30			30
1st order AC test			0.005802			0.05568			0.02323			0.09525
2nd order AC test			0.3463			0.3432			0.6951			0.2079
Hansen Test			0.8785			0.5328			0.7163			0.4289
Sargan Test			0.1987			0.7242			0.007753			0.2240

Estimation Method: Fixed Effects and Two-step System GMM (Arellano and Bover (1995), Blundell Bond (1998)).
See Table 4 footnotes.

Table 8: Unbundled Institutions and Growth: (Sub-sample Robustness Checks)

	(1) Poor	(2) Poor	(3) Poor	(4) Medium	(5) Medium	(6) Medium	(7) High	(8) High	(9) High
Income (T-5)	1.0010*** (0.071)	1.0324*** (0.070)	1.0951*** (0.051)	0.7823*** (0.095)	0.7913*** (0.072)	0.7880*** (0.085)	0.8898*** (0.118)	0.9382*** (0.131)	0.9771*** (0.156)
log (Initial Income)	-0.0542 (0.071)	-0.0704 (0.083)	-0.1500** (0.059)	0.2125* (0.127)	0.1967** (0.091)	0.1982* (0.111)	0.0778 (0.120)	-0.0539 (0.123)	-0.0934 (0.127)
Schooling	0.0494** (0.021)	0.0418 (0.026)	0.0520*** (0.018)	0.0109 (0.059)	0.0230 (0.046)	0.0110 (0.038)	0.0074 (0.031)	0.0350 (0.041)	0.0286 (0.037)
Trade Openness	0.0101 (0.083)	0.0223 (0.083)	0.0397 (0.077)	-0.0598 (0.120)	0.0507 (0.080)	0.0308 (0.103)	-0.0044 (0.107)	-0.0039 (0.047)	0.0000 (0.049)
Govt Consumption	-0.0340 (0.045)	-0.2169*** (0.078)	-0.1124 (0.074)	-0.2157* (0.121)	-0.0927 (0.168)	-0.0657 (0.133)	-0.0312 (0.066)	-0.0513 (0.144)	-0.0274 (0.084)
Law and Order (MC)	0.0403* (0.023)	0.0652*** (0.021)	0.0519*** (0.014)	0.0398* (0.021)	0.0573 (0.043)	0.0545 (0.042)	0.0210 (0.016)	0.0122 (0.018)	0.0216 (0.019)
Regulation (MR)	0.0202 (0.045)	0.0646 (0.058)	0.0060 (0.030)	0.0593* (0.034)	0.0653 (0.045)	0.0762* (0.043)	-0.0002 (0.035)	0.0157 (0.050)	0.0281 (0.059)
Inflation (MS)	-0.1445 (0.095)	-0.1632** (0.082)	-0.2086*** (0.068)	-0.1154 (0.118)	-0.0407 (0.109)	-0.0087 (0.101)	0.8131* (0.432)	0.8581* (0.456)	0.8925* (0.499)
Democracy (ML)	0.0003 (0.005)	-0.0034 (0.010)	0.0000 (0.004)	0.0086 (0.013)	0.0001 (0.018)	0.0027 (0.017)	0.0194* (0.012)	0.0219** (0.011)	0.0212* (0.012)
Investment Profile	0.1059 (0.113)			0.3457** (0.152)			0.0656 (0.133)		
Inflation Volatility		-0.0001*** (0.000)			-0.0001 (0.000)			0.0002** (0.000)	
FDI			0.0014 (0.011)			0.0099 (0.009)			-0.0094 (0.012)
Constant	0.4878 (0.748)	0.1251 (0.358)	1.2141*** (0.336)	-0.0784 (1.090)	-0.3770 (0.548)	-0.4019 (0.863)	-3.7764* (2.219)	0.8438* (0.449)	-3.4558 (2.572)
Observation	156	143	143	153	147	147	149	144	144
Countries	36	35	35	37	36	36	32	31	31
Instruments	30	30	30	30	30	30	30	30	30
1st order AC test	0.05141	0.1181	0.08250	0.009313	0.008451	0.01864	0.03990	0.08342	0.1078
2nd order AC test	0.6797	0.4165	0.6204	0.9453	0.5414	0.5819	0.2299	0.3294	0.6489
Hansen Test	0.5374	0.4648	0.6336	0.5027	0.5724	0.5499	0.3020	0.3887	0.4851
Sargan Test	0.5654	0.5112	0.7388	0.1169	0.02416	0.009748	0.01971	0.2607	0.6299

See Table 4 footnotes.