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# Revisiting the role of the resource curse in shaping institutions and growth

*Syed Mansoob Murshed, Muhammad Badiuzzaman, Mohammad Habibullah Pulok*

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## Abstract

This paper examines the effect of natural resource dependence on growth in a cross-country setting during 1970 to 2010, first accounting for the effect of resource export dependence on institutional development. We* employ several political and governance indicators, numerous econometric techniques on two separate panels, including one post-cold war. Our findings suggest there is a resource curse adversely effecting growth via institutional deterioration in the longer term (1970-2010), but recently (1995-2012) there is a reversal of this adverse effect on some institutions. Moreover, certain institutions matter more for growth, including governance and constraints on the executive relative to democracy.

## Keywords

Resource dependence, growth, institutions.

## JEL classifications: O13, O40, Q33

* Syed Mansoob Murshed: International Institute of Social Studies (ISS), Erasmus University Rotterdam, The Hague, The Netherlands and Coventry University, UK, murshed@iss.nl. (Corresponding Author).
Muhammad Badiuzzaman: Doctoral Researcher, International Institute of Social Studies (ISS), Erasmus University Rotterdam, The Hague, The Netherlands, badiuzzaman@iss.com.
Mohammad Habibullah Pulok: Lecturer, Department of Economics, Southeast University, Bangladesh, mohammad.pulok@barcelonagse.eu

## 1. Introduction

The purpose of this paper is to contribute to the 'resource curse' literature by examining the effect of natural resource dependence on economic growth in a cross-country setting during the 1970 to 2010 period; more specifically by *explicitly* taking into account the effect of resource based exports on institutional development and functioning. The resource curse literature, see Auty (1997) for a seminal contribution, analyses the adverse consequences of a rich natural resource endowment, which turns nature's bounty into a curse. A related earlier literature was known as the 'Dutch Disease', a term utilised since the late 1970s to describe short to medium-term macroeconomic problems associated with an oil price boom in particular; see Neary and Wijnbergen (1986) for a theoretical overview. The mechanisms involved in this literature pertain to real exchange rate appreciation, and changes in relative prices inducing non-traded goods production compared to internationally traded goods. This results in an alteration in the composition of domestic output favouring non-traded goods, a spending boom due to the windfall of a resource boom, and in some specific cases temporary rises in unemployment.

The newer resource curse literature focuses on the more deep-seated consequences of the resource curse. These developments can be sub-divided into three strands. The first emphasises the adverse effects on economic growth due to a host of factors, including the fact that higher wage resource rich economies often miss the first rung on the industrialisation ladder based on labour-intensive manufactured goods exports (Sachs and Warner, 1999). Secondly, resource rich developing countries appear to face a higher risk of civil war due to possible violent contests over rents (Collier and Hoeffler, 2004). Third, there is the adverse effect of resource rents on institutional development which is said to hamper growth; (Ross, 2001) on the detrimental effect of oil dependence on democratic development is one example of the copious literature on this aspect. This is because the presence of substantial resource rents encourages rent seeking, contests over rents, the diminution of accountability, patronage and corruption, all of which detract from growth enhancing productive activity.

Institutions refer not just to the political orientation of a nation, but also the manner in which it is governed. In the growth literature, long-term growth prospects have been linked to well-functioning institutions (Acemoglu and Robinson, 2012, for example). Hence, institutions may be the mechanism in the middle of a variety of causal factors that explain economic progress in the more fundamental sense. This begs the question as to what determines institutions in the first place.

Although it is not our intention to present a survey of the burgeoning empirical literature on the effects of the resource curse on growth via institutions, it is worthwhile pointing out that the chief differences in the literature emanate from: (a) differences in econometric techniques ranging from the use of cross-sectional to panel data analysis; in the latter category some recent papers have employed dynamic panel data analysis; (b) diverse data sets and types of 'institutions', including whether or not the institutions are endogenous or exogenous to natural resource abundance or dependence; (c) and, varying definitions of resource abundance or dependence, depending upon whether the study incorporates the value of the stock of natural capital/resources, or the flow value of natural resource based (primary) exports, or the flow value of the GDP share of primary exports or the flow value of disaggregated categories of primary exports.

One of the earliest cross-sectional, cross-country, empirical studies in the modern genre was by Sachs and Warner (1995), which utilised primary exports as a percentage of GDP, truly

set the resource curse on growth literature in motion. Another early cross-sectional econometric analysis, Isham, Woolcock, Pritchett and Busby (2005) differentiated point-sourced economies identified as exporters of oil, mineral and plantation based crops and found them to have lower growth rates compared to diffuse (agricultural) and manufactured exporters in the 1975-97 period because of the poorer governance (based on the World Bank governance indicators that begin in 1997) engendered by a fuel, mineral or plantation dependent economy. Mehlum, Moene and Torvik (2006) find that when they interact natural resource abundance with the quality of institutions in a growth regression, the resultant coefficient is significant. This means that natural resource abundance has adverse effects *only* in the presence of pre-existing (exogenous) poor institutions. Their analysis, however, is cross-sectional, and they do not take into account the potential reverse causality between institutional quality and growth. Brunnschweiler and Bulte (2008) differentiated between resource dependence and resource abundance, definitions that were used interchangeably in many previous studies. Their measure of resource dependence is resource exports to GDP and mineral exports to GDP; the per capita value of natural resource and sub-soil asset stocks is their resource abundance variable. They correct for endogeneity in both resource dependence and institutions, finding that resource dependence has no significant effect on growth (although the sign is still negative), contrary to many earlier findings. Similarly, Metcalfe (2007) found that the resource curse may not be present except for the 1970 to 1990 period.

The challenge was to extend the cross-sectional econometric analysis so that it has a time dimension, and delve deeper into the role of different types of resource endowment on institutional formation, while differentiating between types of institutions, including political institutions and governance. Mavrotas, Murshed and Torres (2011) carried out one of the earlier panel data analyses on data between 1970 and 2000, where resource dependence first impacts on institutions, followed by the effect of the predicted institutions on growth. The difference between the negative impact of point and diffuse based resource dependence is smaller than in earlier analysis, and governance measured by the economic freedom index (EFI) can be more important for growth than political institutions measured by polity (the degree of democracy and autocracy). A recent study by Busse and Gröning (2013), using contemporary panel data analysis finds that the natural resource export share of GDP negatively impacts on institutions, especially corruption. Williams (2011) finds that point resource type exports exert a negative impact on transparency and information release. When controlling for the impact of transparency or other institutions (informational transparency, executive constraints and ICRG) the sign and significance of the negative effect of point natural resource on growth diminishes, suggesting that the impact of resource dependence on growth is via institutional functioning. Boschini, Petterson and Roine (2013) in their taxonomic study distinguish between different types of institutions and also use recent innovations in panel data econometrics to gauge whether good institutions can reverse the natural resource curse on growth. They allow for the endogeneity of institutions in some instances, but not due to natural resource abundance or dependence, and try out different measures of resource dependence including rents, exports, export share in GDP, as well as differentiating between different types of natural resources. Similar to the study by Metcalfe (2007), the resource curse seems to get weaker in recent years, and the results for the effect of different institutions (chiefly Polity and ICRG) are not always robust to different specifications, periods and samples, except for the ICRG governance type institutions for metals and ores (but not fuel) exporters.

We analyse the impact of resource based exports on a variety of institutional determinants, before looking at the growth impact of these predicted institutions in a panel data setting. We

include political institutions measuring democracy and constraints upon the executive. Furthermore, we separately incorporate institutions of governance as well, such as the rarely used economic freedom index (EFI), as well as the more frequently employed international country risk guide (ICRG). In line with the theoretical reasoning in Acemoglu, Johnson and Robinson (2005), political institutions need to be differentiated from economic institutions, which we term as institutions of governance. It has to be borne in mind that an authoritarian state may sometimes be better managed than a democracy. Our explicit aim is to identify and gauge which institutions matter more for economic growth in the presence of a putative resource curse, as certain types of institutions may be affected more by the presence of natural resource dependence. This is the first innovation of our paper.

Until recently, the use of panel data econometric techniques in the resource curse literature on growth was constrained by the paucity of annualised data. We, however, employ a variety of panel estimation techniques, including the generalised method of moments (GMM) method, to establish robust results covering a substantial period of time between 1970 to 2010. Moreover, we run a separate panel for more recent growth experiences to capture, if any, recent reversals after the cold war in institutional malfunctioning related to resource dependence. This is the second innovation of our paper.

Our third innovation is to do with our measurement of the resource curse. In line with Brunnschweiler and Bulte (2008), we wish to focus on resource dependence not resource abundance. A nation, such as the United States, may be resource abundant, but its economy may not be as resource dependent if its economic structure and international trade is diversified, unlike say Nigeria which is heavily dependent on oil. Our measure of resource dependence relates to the principal exports of a nation, which is arguably an appropriate indicator of a nation's comparative advantage, international competitiveness and factor endowments. As in Mavrotas, Murshed and Torres (2011), we also distinguish between natural resources of the mineral and fuel variety, which we describe as point-source, and other agricultural commodities (diffuse). We expect, *a priori*, a greater adverse effect of point sourced export dependence on economic growth via institutional malfunctioning, given the greater ease with which rents associated with concentrated mineral and fuel extraction can be appropriated compared to agricultural production whose ownership is more diffused. Entrepreneurs in such an environment may choose to become corrupt rent-seekers rather than engage in the ordinary business of production, and this constitutes a major diversion of talent away from production, see Torvik (2002), for example. Moreover, in some societies rent-seeking is more widespread than others, depending on the institutional environment, referred to as 'grabber' friendly institutions by Mehlum, Moene and Torvik (2006), as opposed to producer friendly institutions. In the theoretical model in Mavrotas, Murshed and Torres (2004), corruption or rent-seeking not only detracts from normal production, but can even diminish the availability of productive capital over time, and a lower capital stock is what causes the eventual decline in growth.

The rest of the paper is organised as follows: section two outlines our empirical strategy, our results are presented in section 3, and finally section 4 concludes.

## 2. Data and Empirical Strategy

To investigate the relationship between natural resource dependence and economic growth via institutional development, we employ two sets of cross-country panels. The first panel comprises of 63 developing countries for the period of 1970-2010 (based on a five year moving average), and the second panel consists of 86 developing countries over the more recent period of 1995-2012 (annual data). We may regard the second panel to be a sub-set of the first panel extended by two years focussing on more recent experience. The list of countries for both panels is provided in appendix Table A1. The analysis of first panel in our study can be viewed as an extension of the work of Mavrotas, Murshed and Torres (2011) since we update data until 2010. The second panel focuses on more recent times so as to gauge the impact, if any, of the reversal of the adverse institutional effect of the resource curse, following the post-1991 wave of democratic development and greater emphasis on good governance. Most importantly, the second panel also allows us to use a different set of data on institutional development (ICRG), along with increased country coverage.

*Data Description*

To classify the resource dependency of the selected countries, we first identify two major export items based on Standard International Trade Classification (SITC-3) from UNCTAD (2014). Subsequently, the export commodities were grouped into the following categories: (i) point-source natural resources (minerals and fuels); (ii) diffuse natural resource (agricultural); (iii) coffee or cocoa; and, (iv) manufacturing. Coffee and cocoa were further categorized as point source as these crops are produced and distributed in a more concentrated manner like minerals, following arguments in Isham, Woolcock and Busby (2005) and Mavrotas, Murshed and Torres (2011). The share of point, diffuse and manufactured exports to the two principal export items was obtained, which is a continuous variable in our study. Principal exports are argued to be a more reliable indicator of a nation's resource dependency, as it indicates both external competitiveness and international comparative advantage, which can vary over time as relative factor endowments change. Also, this variable may is a superior indicator of resource dependency in total exports compared to the GDP share of exports, which reflects overall trade dependency or openness, rather than resource dependency *per se*.

We utilise a variety of institutional indicators, relying on data sets for which information is available for the entire sample period (1970-2010), with the exception of the widely used ICRG data set, which only commences from1984. The first set of institutional indicators pertain more to a nation's systemic characteristics and are more process based—whether or not it is democracy, the degree of democracy or autocracy and whether there are checks and balances to executive power. It has to be borne in mind that democracies are not always well governed, and autocracies are not invariably poorly managed. The second group of institutional indicators quantify the quality of national governance. Governance indicators are more 'outcome' based; more a product of policy choices rather than the established, and difficult to alter, rules of the game (constitutions) that govern political systems.

We use the Polity2 variable which gives a combined score on both democracy and autocracy, with a range of between -10 and +10, with +10 being the highest democracy score, and -10 the maximum autocracy score. In this calculation, each country is assigned both a democracy and autocracy score. Established democracies usually get a democracy score of 10, and an autocracy score of 0, making its average polity score 10. Many developing countries, even after the third wave of democratisation following the cold war, are imperfect democracies, combining democratic principles of multi-party elections (often marred by violence and malpractice) with autocratic powers vested in the elected executive. In these countries, both

the democratic and autocratic scores are strictly non-zero, with the combined number often ranging from -6 to +6. A higher non-negative Polity score indicates a greater degree of democracy. Table 1 indicates that the mean sample polity score increased in the 1995 to 2012 period, but is still far from perfect or desirable democracy score of 8 or above.

This brings us to the second political institutional data set employed in our analysis. The executive constraints data in the Polity IV dataset reflect the extent of institutional constraints on the decision-making powers of the chief executive (individual or collective), and can be argued to be more salient in our era of universal (imperfect) multi-party electoral practice because it allows for independent policy making. It is similar to the notion of horizontal accountability and the possible separation of powers; even dictators can be bound by institutional constraints. The functioning of chief executives can be limited by any accountability group in the polity. The degree of constraints on executive are coded on a scale of 1 to 7 where the lowest value (1) refers to unlimited executive authority, while the highest value (7) refers to executive parity or subordination (Marshall, Gurr and Jaggers 2014). Both Polity democracy scores and constraints on the executive tend to be higher for manufactures exporters.

Table 1 indicates that point sourced exporters tend to be richer (per-capita income) than diffuse exporters, and also more than manufactured goods exporters in more recent times, perhaps pointing to the effects of the recent commodity price boom, as well as the entry of many low-income countries into manufactured exporting. When taking the average across the 1970 to 2010 period, point sourced exporters have the lowest growth rates compared to manufactures exporters, with diffuse economies in the middle. In the 1995 to 2012 period diffuse exporters have the lowest growth rates, again due, perhaps, to the resource boom in the past boosting incomes in point sourced exporting nations.

The Economic Freedom Index (EFI) is our first indicator of governance (see, Gwartney, Lawson and Hall, 2014), and is more akin to the 'economic' institutions discussed in Acemoglu, Johnson and Robinson (2005), and Mavrotas, Murshed and Torres (2011). The EFI index consists of five major components: (i) size of government and taxation; (ii) private property and the rule of law; (iii) sound money; (iv) trade regulation and tariffs; and (v) regulation of business, labour and capital markets. This index has a maximum score of 10. Although the country coverage is more limited than ICRG, it has a longer time span and extends to the entire period of our analysis. Table 1 indicates that the average between 1970 and 2010 is lower than for the recent 1995 to 2012 sub-period. Although manufactured goods exporters do best, diffuse exporters do marginally worse than point-sourced exporters, due perhaps to the fact that the diffuse export based economy is on average poorer.

Our second governance data set is the well known ICRG (international country risk guide), utilised in our second panel due to the fact that it only begins in 1984 with a limited country coverage, which increases at later dates. The composite or aggregate ICRG index consists of three broad categories of indicators: political, financial and economic risk. The latter two categories of variables are akin to macroeconomic indicators of debt, exchange rate instability and so on. Therefore, we do not employ them as they do not really correspond to our understanding of 'institutions'. We use the aggregate ICRG index, and the five ICRG political indicators of institutional quality separately: government stability, corruption, law and order, investment profile, and bureaucracy quality. All these variables are measured in different scales, but the highest value always indicates a better status (Howel, 2013). There is little difference in the average performance of different types of exporters, with manufactured goods exporters doing slightly better than point and diffuse economies, with the worst outcomes generally for the poorer diffuse exporter economies.

Table 1: Descriptive Statistics

| Variables | Base Sample | Point | Diffuse | Manufacturing |
|---|---|---|---|---|
| First panel of 63 countries over 1970-2010 period | | | | |
| Polity2 | 0.49 (6.694) | 0.09 (6.818) | -0.15 (6.517) | 3.69 (5.543) |
| Number of observations | 504 | 305 | 136 | 64 |
| Executive constraints | 4.047 (2.215) | 3.955 (2.237) | 3.787 (2.227) | 5.064 (1.801) |
| Number of observations | 483 | 290 | 132 | 62 |
| Economic Freedom Index | 5.42 (1.157) | 5.29 (1.196) | 5.24 (0.978) | 6.36 (0.810) |
| Number of observations | 470 | 284 | 125 | 62 |
| Growth of GDP per capita | 1.47 (3.112) | 1.19 (3.213) | 1.70 (3.208) | 2.31 (2.083) |
| Number of observations | 494 | 298 | 134 | 62 |
| GDP per capita | 2,179 (2,282) | 2,377 (2,566) | 1,551 (1,436) | 2,564 (2,050) |
| Number of observations | 481 | 292 | 129 | 60 |
| Second panel of 86 countries over 1995-2012 period | | | | |
| Polity2 | 1.873 (6.169) | 1.229 (6.362) | 2.347 (5.602) | 3.348 (5.731) |
| Number of observations | 1,526 | 945 | 248 | 333 |
| Executive constraints | 4.350 (1.915) | 4.178 (1.981) | 4.368 (1.869) | 4.830 (1.666) |
| Number of observations | 1,464 | 909 | 231 | 323 |
| Economic Freedom Index | 6.322 (0.956) | 6.305 (1.031) | 5.931 (0.914) | 6.577 (0.684) |
| Number of observations | 936 | 559 | 134 | 243 |
| ICRG Aggregate Index | 64.54( 9.95) | 65.50 (9.59) | 58.93(10.95) | 66.02( 8.65) |
| Number of observations | 1548 | 965 | 249 | 333 |
| Government stability | 8.518 (1.713) | 8.631 (1.646) | 7.872 (1.836) | 8.679 (1.703) |
| Number of observations | 1,548 | 965 | 249 | 333 |
| Corruption | 2.284(0.860) | 2.290(0.869) | 2.157(0.934) | 2.368(0.762) |
| Number of observations | 1,548 | 965 | 249 | 333 |
| Law and order | 3.257 (1.156) | 3.301 (1.153) | 3.022 (1.151) | 3.304 (1.153) |
| Number of observations | 1,548 | 965 | 249 | 333 |
| Bureaucracy quality | 1.666 (0.838) | 1.691 (0.808) | 1.487 (0.900) | 1.730 (0.862) |
| Number of observations | 1,548 | 965 | 249 | 333 |
| Investment profile | 7.261 (2.183) | 7.359 (2.218) | 6.682 (2.280) | 7.410 (1.931) |
| Number of observations | 1,548 | 965 | 249 | 333 |
| Growth of GDP per capita | 2.391 (6.048) | 2.238 (6.093) | 1.604 (4.282) | 3.365 (6.806) |
| Number of observations | 1,471 | 924 | 221 | 325 |
| GDP per capita | 3,518 (6,150) | 4,419 (7,410) | 1,285 (1,470) | 2,484 (2,674) |
| Number of observations | 1,453 | 911 | 216 | 325 |

*Note: Standard deviations are in parenthesis.*

Among other standard growth regressors are a proxy for human capital obtained from the Barro and Lee (2010) dataset. We also employ lagged investment (gross fixed capital formation) as an indicator of the current capital stock. We include initial GDP per capita as a proxy for convergence, hypothesising this coefficient to be negative. Other control variables include some important macroeconomic indicators such as the real exchange rate, whose appreciation (fall) would indicate possible 'Dutch' disease effects by making certain exports less internationally competitive, as well as the terms of trade defined as the ratio of export to import prices whose increase would indicate greater growth prospects, *ceteris paribus*. The detailed definition of variables and their sources are given in appendix Table A2.

*Econometric Methods*

We apply a simultaneous equation model strategy to understand the nature of the nexus between economic development and institutional development. This procedure corrects for the possible reverse causality problem, or in other words, endogeneity issues between institutions and economic growth. Our first equation estimates the relationship between institutional development and resource dependency, thus explicitly endogenising institutions to resource dependence, while the second equation estimates the impact of institutions already influenced by resource dependency (predicted values) on growth, as in Mavrotas, Murshed and Torres (2011). The two equations may be written as:

$$\text{Institutional Development}_{it} = \alpha_1 + \alpha_2 \,\text{Point}_{it} + \alpha_3 \,\text{Diffuse}_{it} + \phi_1 Z_{it} + u_i + e_{it} \quad (1)$$

$$\text{Economic Growth}_{it} = \beta_1 + \beta_2 \,\text{Predicted Institutions}_{it} + \phi_1 Z_{it} + \eta_i + \nu_{it} \quad (2)$$

We apply instrumental variable (IV) regression approaches in both pooled and panel settings, using a variety of regression techniques. The variable point and diffuse as the proportion of country's principal exports is our proxy for natural resource dependency, and also acts as an instrumental variable for institutional development across various regression equations, and subsequently the predicted value of institutional development is plugged into the economic growth equation. Both equations have unobserved country specific and time invariant error terms ($u_i$, $\eta_i$), and normally distributed disturbance terms ($e_{it}$, $\nu_{it}$).

Following the standard approach in growth literature, we include initial level of per capita GDP and human capital in our regression analysis. Our human capital variable refers to the average years of schooling of the population aged 15 and above for the *initial* year of the panel, as human capital in particular has a long gestation period from investment to fruition. We utilise lagged (one five year period in the 1970-2010 panel, and one year in the 1995-2012 panel) investment as a ratio of GDP. We also include the standard deviation of exchange rate and terms of trade on a five-year moving average basis (for first panel of 1970-2010) to capture macroeconomic instability and possible 'Dutch' disease mechanisms. Inclusion of these variables also control for possible non-political economy channels that can also affect economic growth. For the second panel (1995-2012), we take the first difference for these two variables (exchange rate and terms of trade) since it is an annual dataset. We take two measures of the exchange rate where the real effective exchange rate is applied in the first panel, and the official exchange rate is used in the second panel due to data limitations. All the macroeconomic control variables are denoted by vector $Z_i$.

We use several panel regression techniques, starting with a pooled OLS regression using two stage instrumental variable techniques. At the start, we estimated a fixed effect model with time dummies to see whether time has any effect in addition to controlling for country fixed effects. Joint tests (F-statistics) of time dummies do not show any significant impact of time in our case. Consequently, we dropped the time dummy from the fixed effect model. As a next step, we estimate a random effects model, and compare the result with fixed effect models. The Hausman test statistics do not yield consistent results across various specifications (in relation to different institutional variables). Therefore, we report both the results of fixed and random effects models. Although the Hausman test suggests reliance on fixed effects in a very few specifications, it is more appealing to use random effects as the two instrumental variables: point and diffuse are almost time invariant in nature. Note that our regression estimations also control for initial levels of income and human capital; this also minimizes country heterogeneity. Moreover, we used IV GMM for fixed effects and FGLS for random effects (standard error corrected), to get efficient estimates. The two

instrumental variables, point and diffuse, are found to be valid across various regression specifications (Sargan-Hansen test statistics) in both panels.

## 3. Results and Analysis

The results of our econometric analysis are presented in tables 2-13. Each table reports the second stage of our IV estimations in the upper segment, with the lower panel of the table indicating the first stage regression (predicted institutional value estimation). Each table pertains to a particular institutional variable in one panel (1970 to 2010 and/or 1995 to 2012). Each table reports six different panel IV econometric methodologies: pooled OLS, pooled GMM, fixed effects, GMM fixed effects, random effects and FGLS (feasible generalised least squares) for random effects. We may discount the results of the fixed effects estimate (static panel and GMM) in columns 4 and 5 of each table, as we are interested in the variation across the sample, and given the fact that for most countries the export type is rather invariant over time. We can also control for country heterogeneity via initial human capital and per capita income. Furthermore, the use of standard fixed effects models may be inappropriate in the presence of individual effects (Durlauf, Johnson and Temple, 2004). A crucial assumption in the random effects model is that the two error components (time and non-time invariant) are homoskedastic and serially uncorrelated. To address these issues and obtain efficient estimates we deploy the FGLS (standard error corrected) method.

Tables 2 to 5 report on results with political institutions. In table 2 the polity variable is positive and significant in several cases, importantly in the FGLS and pooled GMM estimates, for the period 1970 to 2010. This indicates that democratic development, and greater democracy, is good for growth. For the more recent sub-period between 1995 and 2012 (table 3), however, the polity variable is either insignificant or has the wrong sign. This may be due to the fact that democracy scores improved for most developing countries following the end of the cold war, making democracy less salient in explaining cross-country variations in growth after some point in time in the 1990s. In fact, in the first stage regression in table 3 (1995-2012) the negative impact of diffuse exports on democratic development is reversed, as many of the coefficients for the diffuse variable are positive.

By contrast, however, in tables 4 and 5 the institutional variable ‘constraints on the executive’, is significant for the FGLS estimate (and also for the pooled estimates in table 4 which pertains to the complete period) making this political variable more crucial for growth than the existence of simple multi-party democratic elections in recent years. The magnitude of the coefficient is generally greater for executive constraints compared to that for Polity (degree of democracy). This means that the separation of powers, less untrammelled executive power and a degree of independent policy making is more significant in explaining growth in recent years. If the positive effect of democracy on growth occurs via channels that encourage government accountability, and discourage patronage and corruption, then constraints on the executive are a more powerful mechanism in this context than mere multi-party elections (the main ingredient in the construction of the Polity index). Elected governments in imperfect democracies (described as anocracies in political science) can be corrupt and factional serving only their own narrow interest groups. Indeed, it can be argued that one of the chief characteristics of imperfect democracy is the lack of constraints on the executive.

Table 2: POLITY and Growth: 1970-2010

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Polity2 | 0.647** | 0.653** | 0.177 | 0.186 | 0.185 | 0.165*** |
| | (0.319) | (0.295) | (0.147) | (0.116) | (0.135) | (0.0314) |
| Exchange rate | -0.000293 | -0.000309 | -0.00304 | -0.00302* | -0.00273 | 0.000729 |
| | (0.00143) | (0.000856) | (0.00250) | (0.00171) | (0.00221) | (0.000475) |
| Terms of trade | 0.00253 | 0.00332 | -0.0354 | -0.0359 | -0.0357* | -0.0341** |
| | (0.0409) | (0.0410) | (0.0219) | (0.0236) | (0.0201) | (0.0163) |
| Investment | 0.171** | 0.172** | -0.0830** | -0.0805* | -0.0783** | 0.0282 |
| | (0.0694) | (0.0695) | (0.0381) | (0.0416) | (0.0350) | (0.0190) |
| Human capital | -1.566 | -1.603 | - | - | 0.710 | 1.165*** |
| | (1.537) | (1.491) | - | - | (2.779) | (0.207) |
| Initial Y | -1.003*** | -1.000*** | - | - | -0.388 | -0.608*** |
| | (0.369) | (0.346) | - | - | (1.807) | (0.133) |
| Constant | 5.467** | 5.434*** | - | - | 4.803 | 3.619*** |
| | (2.184) | (2.006) | - | - | (11.40) | (0.843) |
| Observations | 306 | 306 | 306 | 306 | 306 | 306 |
| R-squared | -1.093 | -1.119 | 0.048 | 0.043 | - | - |
| No. of Countries | - | - | 54 | 54 | 54 | 54 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -2.596** | -2.596** | -5.508*** | -5.508*** | -4.900*** | -2.519*** |
| | (1.168) | (1.017) | (1.549) | (1.927) | (1.246) | (0.565) |
| Diffuse | -2.478* | -2.478** | -4.209*** | -4.209*** | -3.828*** | -2.639*** |
| | (1.289) | (1.144) | (1.348) | (1.099) | (1.209) | (0.711) |
| Exchange rate | 0.00121 | 0.00121 | -0.000519 | -0.000519 | 0.000262 | 0.00186** |
| | (0.00188) | (0.000922) | (0.00413) | (0.00274) | (0.00270) | (0.000861) |
| Terms of trade | -0.0671 | -0.0671 | 0.0263 | 0.0263 | 0.0135 | 0.00216 |
| | (0.0442) | (0.0443) | (0.0359) | (0.0330) | (0.0353) | (0.0310) |
| Investment | -0.204*** | -0.204*** | -0.131** | -0.131 | -0.153*** | -0.280*** |
| | (0.0503) | (0.0537) | (0.0566) | (0.0917) | (0.0514) | (0.0342) |
| Human capital | 4.451*** | 4.451*** | - | - | 3.401*** | 6.451*** |
| | (0.707) | (0.825) | - | - | (1.256) | (0.492) |
| Initial Y | 0.706 | 0.706 | - | - | 0.824 | 0.927*** |
| | (0.448) | (0.438) | - | - | (0.828) | (0.287) |
| Constant | -1.434 | -1.434 | 8.323*** | 8.323*** | -0.896 | -4.275** |
| | (2.850) | (2.720) | (1.665) | (2.344) | (5.227) | (1.936) |
| Observations | 306 | 306 | 306 | 306 | 306 | 306 |
| R-squared | 0.240 | 0.240 | 0.081 | 0.081 | - | - |
| No. of countries | - | - | 54 | 54 | 54 | 54 |
| Sargan-Hansen test | 0.7084 | 0.7264 | 0.7085 | 0.6695 | 0.6946 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 3: POLITY and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Polity2 | 0.00793 | 0.0537 | -0.528 | -0.00202 | -0.0498 | -0.285 |
| | (0.273) | (0.257) | (4.540) | (4.134) | (1.646) | (0.180) |
| Exchange rate | -0.000853*** | -0.000892** | -0.00102 | -0.000911 | -0.000921** | -0.000750*** |
| | (0.000223) | (0.000439) | (0.000878) | (0.000916) | (0.000366) | (0.000177) |
| Terms of trade | 0.0377*** | 0.0328*** | 0.0523 | 0.0432 | 0.0440 | 0.0246*** |
| | (0.0105) | (0.0105) | (0.0769) | (0.0687) | (0.0271) | (0.00732) |
| Investment | 0.110*** | 0.163*** | 0.0468 | 0.0290 | 0.0387 | 0.0529* |
| | (0.0404) | (0.0418) | (0.127) | (0.128) | (0.0362) | (0.0314) |
| Human capital | 0.356 | 0.257 | - | - | 0.507 | 0.576*** |
| | (0.326) | (0.298) | - | - | (2.035) | (0.195) |
| Initial Y | -0.871** | -0.497 | - | - | -1.078 | -0.987*** |
| | (0.360) | (0.353) | - | - | (2.541) | (0.175) |
| Constant | 4.208* | 0.720 | - | - | 6.539 | 6.264*** |
| | (2.413) | (2.455) | - | - | (11.31) | (1.458) |
| Observations | 1,029 | 1,029 | 1,029 | 1,029 | 1,029 | 1,030 |
| R-squared | 0.097 | 0.091 | -0.074 | 0.039 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.808* | -0.808* | -0.126 | -0.126 | -0.181 | -0.647** |
| | (0.474) | (0.460) | (0.494) | (0.549) | (0.479) | (0.285) |
| Diffuse | 0.870 | 0.870 | 0.0525 | 0.0525 | 0.0878 | 1.222*** |
| | (0.683) | (0.643) | (0.570) | (0.791) | (0.558) | (0.362) |
| Exchange rate | 7.56e-05 | 7.56e-05 | -0.000186 | -0.000186 | -0.000182 | 5.22e-05 |
| | (0.000308) | (0.000182) | (0.000131) | (0.000306) | (0.000131) | (0.000167) |
| Terms of trade | -0.00935 | -0.00935 | 0.0170*** | 0.0170*** | 0.0167*** | 0.00776 |
| | (0.0135) | (0.0138) | (0.00533) | (0.00614) | (0.00535) | (0.00908) |
| Investment | -0.125*** | -0.125*** | 0.0270* | 0.0270 | 0.0226 | -0.147*** |
| | (0.0278) | (0.0292) | (0.0164) | (0.0275) | (0.0163) | (0.0163) |
| Human capital | 1.140*** | 1.140*** | - | - | 1.207*** | 1.048*** |
| | (0.109) | (0.104) | - | - | (0.391) | (0.0566) |
| Initial Y | -1.103*** | -1.103*** | - | - | -1.479** | -0.680*** |
| | (0.190) | (0.214) | - | - | (0.642) | (0.123) |
| Constant | 7.664*** | 7.664*** | 2.455*** | 2.455*** | 6.310* | 6.326*** |
| | (1.334) | (1.384) | (0.490) | (0.713) | (3.751) | (0.901) |
| Observations | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| R-squared | 0.119 | 0.119 | 0.016 | 0.016 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0000 | 0.0000 | 0.6384 | 0.6235 | 0.9835 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 4: Constraints on the Executive and Growth: 1970-2010

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Executive constraints | 2.122* | 2.103* | 0.500 | 0.546 | 0.548 | 3.100*** |
| | (1.199) | (1.115) | (0.453) | (0.381) | (0.412) | (0.593) |
| Exchange rate | 0.000560 | 0.000542 | -0.00192 | -0.00178 | -0.00131 | 0.00111** |
| | (0.00143) | (0.00167) | (0.00286) | (0.00235) | (0.00229) | (0.000547) |
| Terms of trade | 0.0144 | 0.0137 | -0.0456** | -0.0451** | -0.0454** | 0.0388* |
| | (0.0501) | (0.0477) | (0.0221) | (0.0208) | (0.0204) | (0.0229) |
| Investment | 0.154** | 0.154** | -0.0798** | -0.0760* | -0.0696** | 0.186*** |
| | (0.0740) | (0.0763) | (0.0348) | (0.0408) | (0.0318) | (0.0356) |
| Human capital | -1.735 | -1.712 | - | - | 0.597 | -3.882*** |
| | (1.728) | (1.678) | - | - | (1.673) | (1.042) |
| Initial Y | -1.062** | -1.049** | - | - | -0.383 | -1.783*** |
| | (0.458) | (0.455) | - | - | (1.069) | (0.248) |
| Constant | -1.915 | -1.937 | - | - | 2.733 | 0.137 |
| | (3.590) | (3.375) | - | - | (6.746) | (1.159) |
| Observations | 291 | 291 | 291 | 291 | 291 | 306 |
| R-squared | -1.671 | -1.636 | 0.011 | -0.003 | - | - |
| No. of countries | - | - | 54 | 54 | 54 | 54 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.719* | -0.719** | -1.746*** | -1.746** | -1.443*** | -0.442*** |
| | (0.383) | (0.348) | (0.562) | (0.687) | (0.425) | (0.140) |
| Diffuse | -0.751* | -0.751* | -1.319*** | -1.319*** | -1.207*** | -0.655*** |
| | (0.423) | (0.400) | (0.491) | (0.441) | (0.425) | (0.165) |
| Exchange rate | -7.29e-05 | -7.29e-05 | -0.00260* | -0.00260** | -0.000763 | -0.000100 |
| | (0.000616) | (0.000926) | (0.00150) | (0.00109) | (0.000860) | (0.000749) |
| Terms of trade | -0.0264* | -0.0264* | 7.37e-05 | 7.37e-05 | -0.00565 | -0.0242*** |
| | (0.0148) | (0.0143) | (0.0136) | (0.0135) | (0.0133) | (0.00826) |
| Investment | -0.0571*** | -0.0571*** | -0.0241 | -0.0241 | -0.0376** | -0.0574*** |
| | (0.0170) | (0.0176) | (0.0209) | (0.0313) | (0.0182) | (0.00984) |
| Human capital | 1.348*** | 1.348*** | - | - | 1.104*** | 1.670*** |
| | (0.236) | (0.262) | - | - | (0.371) | (0.139) |
| Initial Y | 0.274* | 0.274* | - | - | 0.281 | 0.389*** |
| | (0.149) | (0.148) | - | - | (0.244) | (0.0815) |
| Constant | 2.995*** | 2.995*** | 6.349*** | 6.349*** | 3.241** | 1.638*** |
| | (0.949) | (1.012) | (0.610) | (0.761) | (1.539) | (0.605) |
| Observations | 291 | 291 | 291 | 291 | 291 | 291 |
| R-squared | 0.226 | 0.226 | 0.076 | 0.076 | - | - |
| No. of countries | - | - | 54 | 54 | 54 | 54 |
| Sargan-Hansen test | 0.695 | 0.713 | 0.499 | 0.449 | 0.531 | - |
| Hausman Test | | | | | YES | |

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table 5: Constraints on the Executive and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Executive constraints | 3.928 | 3.660 | 1.714 | 1.623 | -0.598 | 2.721*** |
| | (2.449) | (2.425) | (3.317) | (3.113) | (4.468) | (0.590) |
| Exchange rate | -0.00111** | -0.00111* | -0.00102*** | -0.00101** | -0.000882*** | -0.000757*** |
| | (0.000440) | (0.000572) | (0.000281) | (0.000487) | (0.000299) | (0.000175) |
| Terms of trade | 0.0753*** | 0.0732** | 0.0419*** | 0.0419*** | 0.0442*** | 0.0334*** |
| | (0.0281) | (0.0305) | (0.0108) | (0.0116) | (0.00871) | (0.00776) |
| Investment | 0.246** | 0.240** | 0.000833 | 0.000798 | 0.0219 | 0.235*** |
| | (0.109) | (0.107) | (0.0324) | (0.0393) | (0.0590) | (0.0323) |
| Human capital | -1.079 | -0.980 | - | - | 0.684 | -0.603*** |
| | (0.926) | (0.908) | - | - | (1.717) | (0.201) |
| Initial Y | -0.101 | -0.108 | - | - | -1.329 | -0.375*** |
| | (0.617) | (0.598) | - | - | (1.336) | (0.137) |
| Constant | -14.57 | -13.71 | - | - | 10.44 | -9.786*** |
| | (12.73) | (12.39) | - | - | (21.72) | (3.155) |
| Observations | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,030 |
| R-squared | -2.521 | -2.156 | -0.100 | -0.085 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.259* | -0.259* | 0.258 | 0.258* | 0.196 | -0.372*** |
| | (0.149) | (0.146) | (0.180) | (0.152) | (0.172) | (0.0730) |
| Diffuse | -0.0714 | -0.0714 | 0.225 | 0.225 | 0.194 | -0.150 |
| | (0.215) | (0.210) | (0.206) | (0.177) | (0.199) | (0.107) |
| Exchange rate | 7.03e-05 | 7.03e-05 | 4.92e-05 | 4.92e-05 | 4.89e-05 | 6.92e-06 |
| | (9.61e-05) | (6.07e-05) | (4.68e-05) | (6.32e-05) | (4.69e-05) | (7.40e-05) |
| Terms of trade | -0.00727* | -0.00727 | 0.00169 | 0.00169 | 0.00152 | -0.00206 |
| | (0.00426) | (0.00484) | (0.00194) | (0.00271) | (0.00195) | (0.00161) |
| Investment | -0.0421*** | -0.0421*** | 0.00399 | 0.00399 | 0.00195 | -0.0522*** |
| | (0.00904) | (0.00938) | (0.00611) | (0.00715) | (0.00605) | (0.00554) |
| Human capital | 0.369*** | 0.369*** | - | - | 0.382*** | 0.327*** |
| | (0.0343) | (0.0319) | - | - | (0.115) | (0.0179) |
| Initial Y | -0.214*** | -0.214*** | - | - | -0.307 | -0.135*** |
| | (0.0606) | (0.0632) | - | - | (0.189) | (0.0331) |
| Constant | 5.220*** | 5.220*** | 4.382*** | 4.382*** | 4.501*** | 5.345*** |
| | (0.436) | (0.464) | (0.181) | (0.210) | (1.109) | (0.249) |
| Observations | 1,006 | 1,006 | 1,006 | 1,006 | 1,006 | 1,006 |
| R-squared | 0.136 | 0.136 | 0.005 | 0.005 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0140 | 0.0158 | 0.8094 | 0.7893 | 0.0970 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

We now turn to the more outcome based governance institutional indicators. The first data set deployed in that category is the economic freedom index (EFI) which has a longer time span covering the entire sample period, allowing us to estimate its effect on the full panel (1970-2010), as well as for the 1995-2012 sub-period. This index contains aspects of economic governance: the conduct of monetary policy, the size of government, trade and tariff policies, as well as facets of property rights and the rule of law, corresponding more closely to what Acemoglu, Robinson and Johnson (2005) describe as 'economic' institutions. These are meant, in theory, to have a more direct impact than political institutions in determining long-term growth prospects. Given any distribution of income (and hence political power) the security of risky investment hinges on contract enforcement and the sanctity of property rights. Table 6 gives the results for the effect of the EFI index on growth for the entire period (1970-2010), and it is positive and significant in all but the fixed effects estimators. The coefficients are larger than for Polity (democracy) but smaller than for constraints on the executive. When we come to the more recent sub-period (1995-2012) reported in table 7, the magnitude of the coefficient on EFI is the largest of any institutional indicator we analyse, and is significant in all the estimates except for the fixed effects regressions.

The ICRG governance data set is well known and widely employed, but it only began in 1984 with limited country coverage, especially for developing countries which we are interested in, and country coverage gradually expands as we move through time in the 1990s and beyond. Hence we are compelled to employ them only for our second panel, pertaining to the sub-period 1995 to 2012.The regression results for ICRG composite index is presented in table 8 and the results for the five sub-components of political risk are reported in tables 9-13. In table 8 the ICRG aggregate index of country risk is positive and significant in three instances, but the magnitude of the coefficient is smaller than for the corresponding EFI coefficient.

Table 9 gives the results for the political risk category, government stability, which is an indicator of the government's ability to remain in office during its tenure and carry out its programme hinging on internal unity, its legislative strength and popular support. Thus, it is different from Polity, which focuses on the quality and impartiality of the electoral process, as well as the openness of executive recruitment. This variable turns out to be significant in contributing to growth in three instances, including crucially in the random effects FGLS and pooled GMM estimates.

Table 10 reports results for corruption, and the ICRG corruption indicator focuses most on systemic corruption and patronage networks. Its effect on growth is insignificant, and with the wrong sign in two (random effects) estimates, which matter most for our analysis. The reasoning behind this puzzling result is two-fold. First, we have taken in a short and specific time period. Secondly, during this time aspects of governance, specifically the cruder forms of systemic corruption and patronage were on the wane at the behest of bilateral and multilateral donors in the post cold war era. Indeed, the coefficients on diffuse in the first stage regression in table 10 are positive instead of being negative, and the same applies to point sourced economies in several of the estimation methods reported in table 10, pointing to an institutional reversal of moderate proportions for the better with regard to systemic corruption. Note that this improvement, if any, pertains mainly to diffuse type exporters.

Table 6: The Economic Freedom Index and Growth: 1970-2010

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Economic Freedom Index | 1.478*** | 1.489*** | 0.554 | 0.578 | 0.924** | 1.564*** |
| | (0.447) | (0.343) | (0.462) | (0.353) | (0.414) | (0.282) |
| Exchange rate | 0.00176** | 0.00177*** | -0.00215 | -0.00209 | 0.000728 | 0.00178*** |
| | (0.000881) | (0.000558) | (0.00261) | (0.00164) | (0.00130) | (0.000558) |
| Terms of trade | -0.0188 | -0.0183 | -0.0300 | -0.0298 | -0.0310 | -0.0162 |
| | (0.0215) | (0.0218) | (0.0205) | (0.0222) | (0.0193) | (0.0170) |
| Investment | 0.0407* | 0.0399 | -0.0987*** | -0.0964*** | -0.0322 | 0.0134 |
| | (0.0222) | (0.0263) | (0.0322) | (0.0365) | (0.0262) | (0.0194) |
| Human capital | 0.578 | 0.600* | - | - | 0.864 | 0.434 |
| | (0.388) | (0.331) | - | - | (0.563) | (0.274) |
| Initial Y | -0.588*** | -0.601*** | - | - | -0.443 | -0.606*** |
| | (0.193) | (0.179) | - | - | (0.336) | (0.133) |
| Constant | -4.110 | -4.100** | - | - | -0.826 | -3.883** |
| | (2.550) | (2.090) | - | - | (3.003) | (1.723) |
| Observations | 305 | 305 | 305 | 305 | 305 | 306 |
| R-squared | 0.222 | 0.221 | 0.162 | 0.165 | - | - |
| No. of countries | - | - | 54 | 54 | 54 | 54 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -1.121*** | -1.121*** | -1.471*** | -1.471*** | -1.303*** | -1.157*** |
| | (0.201) | (0.147) | (0.335) | (0.354) | (0.223) | (0.0977) |
| Diffuse | -1.110*** | -1.110*** | -1.413*** | -1.413*** | -1.245*** | -1.148*** |
| | (0.222) | (0.150) | (0.291) | (0.213) | (0.233) | (0.0954) |
| Exchange rate | -0.000856*** | -0.000856*** | -0.00173* | -0.00173 | -0.000963** | -0.000795*** |
| | (0.000323) | (0.000177) | (0.000893) | (0.00112) | (0.000405) | (0.000146) |
| Terms of trade | -0.0164** | -0.0164* | -0.00319 | -0.00319 | -0.00905 | -0.00894 |
| | (0.00763) | (0.00838) | (0.00777) | (0.00738) | (0.00739) | (0.00583) |
| Investment | -0.000363 | -0.000363 | -0.0128 | -0.0128 | -0.00382 | -0.00362 |
| | (0.00865) | (0.00854) | (0.0123) | (0.0202) | (0.00959) | (0.00570) |
| Human capital | 0.488*** | 0.488*** | - | - | 0.463*** | 0.512*** |
| | (0.122) | (0.122) | - | - | (0.162) | (0.0762) |
| Initial Y | 0.0264 | 0.0264 | - | - | 0.0232 | 0.0522 |
| | (0.0770) | (0.0757) | - | - | (0.105) | (0.0528) |
| Constant | 5.879*** | 5.879*** | 7.043*** | 7.043*** | 6.102*** | 5.746*** |
| | (0.490) | (0.477) | (0.360) | (0.462) | (0.667) | (0.302) |
| Observations | 305 | 305 | 305 | 305 | 305 | 305 |
| R-squared | 0.215 | 0.215 | 0.147 | 0.147 | - | - |
| No. of countries | - | - | 54 | 54 | 54 | 54 |
| Sargan-Hansen test | 0.6047 | 0.6025 | 0.5516 | 0.4776 | 0.7951 | - |
| Hausman Test | | | YES | | | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 7: The Economic Freedom Index and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Economic Freedom Index | 5.178*** | 5.295*** | -5.824 | -6.257 | 6.501* | 4.454*** |
| | (1.368) | (1.285) | (7.621) | (7.671) | (3.666) | (0.687) |
| Exchange rate | 0.000148 | 0.000149 | -0.000498 | -0.000505** | -0.000109 | -0.000422** |
| | (0.000356) | (0.000176) | (0.000320) | (0.000231) | (0.000308) | (0.000184) |
| Terms of trade | 0.0745*** | 0.0801*** | 0.0518*** | 0.0515*** | 0.0524*** | 0.0330*** |
| | (0.0170) | (0.0239) | (0.0121) | (0.0144) | (0.0120) | (0.00752) |
| Investment | 0.149*** | 0.144*** | 0.0910 | 0.0957 | 0.0262 | 0.0868*** |
| | (0.0328) | (0.0330) | (0.0976) | (0.0959) | (0.0459) | (0.0157) |
| Human capital | -0.190 | -0.164 | - | - | -0.324 | -0.352*** |
| | (0.216) | (0.197) | - | - | (0.534) | (0.112) |
| Initial Y | -1.652*** | -1.711*** | - | - | -1.866*** | -1.420*** |
| | (0.292) | (0.343) | - | - | (0.650) | (0.133) |
| Constant | -20.95*** | -21.29*** | - | - | -24.33 | -15.72*** |
| | (6.453) | (5.959) | - | - | (16.50) | (3.186) |
| Observations | 698 | 698 | 698 | 698 | 698 | 1,030 |
| R-squared | -0.705 | -0.751 | -0.331 | -0.376 | - | - |
| No. of countries | - | - | 58 | 58 | 58 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.337*** | -0.337*** | 0.0967 | 0.0967 | 0.0530 | -0.280*** |
| | (0.0817) | (0.0766) | (0.0867) | (0.134) | (0.0831) | (0.0320) |
| Diffuse | -0.455*** | -0.455*** | 0.161 | 0.161 | 0.120 | -0.316*** |
| | (0.126) | (0.132) | (0.101) | (0.122) | (0.0989) | (0.0430) |
| Exchange rate | -6.74e-05 | -6.74e-05*** | -2.11e-05 | -2.11e-05 | -2.23e-05 | -6.63e-05*** |
| | (5.42e-05) | (1.73e-05) | (2.03e-05) | (1.52e-05) | (2.03e-05) | (2.06e-05) |
| Terms of trade | -0.00475** | -0.00475 | 0.000553 | 0.000553 | 0.000472 | -0.00129 |
| | (0.00237) | (0.00357) | (0.000854) | (0.000638) | (0.000856) | (0.00121) |
| Investment | -0.00696 | -0.00696 | 0.0101*** | 0.0101 | 0.00969*** | 0.000261 |
| | (0.00539) | (0.00515) | (0.00325) | (0.00618) | (0.00322) | (0.00210) |
| Human capital | 0.122*** | 0.122*** | - | - | 0.125* | 0.143*** |
| | (0.0200) | (0.0179) | - | - | (0.0663) | (0.00778) |
| Initial Y | 0.140*** | 0.140*** | - | - | 0.145 | 0.144*** |
| | (0.0339) | (0.0361) | - | - | (0.107) | (0.0174) |
| Constant | 5.073*** | 5.073*** | 6.107*** | 6.107*** | 4.335*** | 4.744*** |
| | (0.258) | (0.271) | (0.0915) | (0.134) | (0.650) | (0.117) |
| Observations | 704 | 704 | 704 | 704 | 704 | 704 |
| R-squared | 0.207 | 0.207 | 0.021 | 0.021 | - | - |
| No. of countries | - | - | 58 | 58 | 58 | 58 |
| Sargan-Hansen test | 0.1521 | 0.1441 | 0.7118 | 0.6939 | 0.1613 | - |
| Hausman Test | | | YES | | | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 8: ICRG Composite Index and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| ICRG Composite Index | 0.679*** | 0.691*** | -0.0163 | -0.0241 | -0.0121 | 0.628*** |
| | (0.171) | (0.193) | (0.155) | (0.129) | (0.151) | (0.0932) |
| Exchange rate | 0.000310 | 0.000332 | -0.000936*** | -0.000943* | -0.000930*** | 0.000203 |
| | (0.000404) | (0.000449) | (0.000292) | (0.000494) | (0.000284) | (0.000228) |
| Terms of trade | 0.0310** | 0.0308** | 0.0440*** | 0.0442*** | 0.0438*** | 0.00676 |
| | (0.0121) | (0.0127) | (0.0108) | (0.0110) | (0.0104) | (0.00751) |
| Investment | -0.0325 | -0.0351 | 0.0334 | 0.0283 | 0.0348 | -0.0147 |
| | (0.0435) | (0.0574) | (0.0297) | (0.0446) | (0.0288) | (0.0240) |
| Human capital | 0.126 | 0.123 | - | - | 0.455 | 0.107* |
| | (0.116) | (0.119) | - | - | (0.728) | (0.0605) |
| Initial Y | -3.682*** | -3.730*** | - | - | -0.957 | -3.360*** |
| | (0.725) | (0.855) | - | - | (1.344) | (0.388) |
| Constant | -16.34*** | -16.74*** | - | - | 6.703 | -16.07*** |
| | (5.304) | (5.707) | - | - | (8.560) | (3.124) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -0.432 | -0.461 | 0.031 | 0.026 | - | - |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -1.838*** | -1.838*** | 1.044 | 1.044 | 0.416 | -1.806*** |
| | (0.552) | (0.528) | (0.891) | (1.444) | (0.807) | (0.322) |
| Diffuse | -3.400*** | -3.400*** | -4.121*** | -4.121** | -4.383*** | -2.786*** |
| | (0.796) | (0.938) | (1.029) | (1.805) | (0.961) | (0.497) |
| Exchange rate | -0.00162*** | -0.00162*** | -0.00115*** | -0.00115*** | -0.00117*** | -0.00146*** |
| | (0.000359) | (0.000304) | (0.000236) | (0.000194) | (0.000236) | (0.000271) |
| Terms of trade | 0.0141 | 0.0141 | 0.0277*** | 0.0277*** | 0.0271*** | 0.0310*** |
| | (0.0157) | (0.0163) | (0.00963) | (0.00590) | (0.00964) | (0.0107) |
| Investment | 0.182*** | 0.182*** | 0.0556* | 0.0556 | 0.0650** | 0.161*** |
| | (0.0324) | (0.0351) | (0.0296) | (0.0574) | (0.0289) | (0.0211) |
| Human capital | 0.342*** | 0.342*** | - | - | 0.434 | 0.278*** |
| | (0.127) | (0.125) | - | - | (0.397) | (0.0715) |
| Initial Y | 4.040*** | 4.040*** | - | - | 3.863*** | 4.065*** |
| | (0.221) | (0.219) | - | - | (0.652) | (0.127) |
| Constant | 33.15*** | 33.15*** | 65.38*** | 65.38*** | 35.29*** | 34.59*** |
| | (1.554) | (1.571) | (0.884) | (1.535) | (3.862) | (0.984) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.458 | 0.458 | 0.077 | 0.077 | - | - |
| Number of Country | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.7433 | 0.7706 | 0.6181 | 0.6331 | 0.7202 | - |
| Hausman Test | | | | | YES | |

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table 9: ICRG (Government Stability) and Growth relationship:1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IVGMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Government stability | 2.186*** | 2.170*** | -0.981 | -1.000 | 1.369 | 1.674*** |
| | (0.686) | (0.740) | (2.029) | (2.146) | (1.287) | (0.305) |
| Exchange rate | -0.000808*** | -0.000783** | -0.000818*** | -0.000815 | -0.00100*** | -0.000657*** |
| | (0.000286) | (0.000349) | (0.000317) | (0.000528) | (0.000268) | (0.000179) |
| Terms of trade | 0.0359*** | 0.0330*** | 0.0430*** | 0.0429*** | 0.0431*** | 0.0232*** |
| | (0.0123) | (0.0116) | (0.00985) | (0.00988) | (0.0102) | (0.00732) |
| Investment | 0.0769*** | 0.0888*** | -0.0139 | -0.0143 | 0.0943* | 0.0857*** |
| | (0.0273) | (0.0344) | (0.101) | (0.104) | (0.0485) | (0.0159) |
| Human capital | 0.686*** | 0.674*** | - | - | 0.606** | 0.501*** |
| | (0.143) | (0.154) | - | - | (0.269) | (0.0698) |
| Initial Y | -1.291*** | -1.195*** | - | - | -1.217*** | -1.035*** |
| | (0.214) | (0.280) | - | - | (0.413) | (0.107) |
| Constant | -12.93** | -13.68** | - | - | -6.283 | -9.433*** |
| | (5.509) | (5.702) | - | - | (11.60) | (2.623) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -0.498 | -0.490 | -0.065 | -0.069 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.178 | -0.178 | -0.424 | -0.424 | -0.343 | -0.158 |
| | (0.133) | (0.132) | (0.312) | (0.422) | (0.220) | (0.119) |
| Diffuse | -0.962*** | -0.962*** | -0.479 | -0.479 | -0.741*** | -1.070*** |
| | (0.192) | (0.191) | (0.360) | (0.577) | (0.281) | (0.174) |
| Exchange rate | -2.83e-06 | -2.83e-06 | 0.000103 | 0.000103 | 8.02e-05 | -4.40e-05 |
| | (8.68e-05) | (5.73e-05) | (8.26e-05) | (7.97e-05) | (8.14e-05) | (8.38e-05) |
| Terms of trade | -0.000115 | -0.000115 | -0.000440 | -0.000440 | -0.000566 | -0.000997 |
| | (0.00380) | (0.00355) | (0.00337) | (0.00223) | (0.00337) | (0.00339) |
| Investment | 0.00811 | 0.00811 | -0.0481*** | -0.0481*** | -0.0296*** | 0.00180 |
| | (0.00783) | (0.00788) | (0.0103) | (0.0144) | (0.00939) | (0.00711) |
| Human capital | -0.144*** | -0.144*** | - | - | -0.134** | -0.140*** |
| | (0.0308) | (0.0288) | - | - | (0.0653) | (0.0257) |
| Initial Y | 0.136** | 0.136*** | - | - | 0.154 | 0.0959** |
| | (0.0535) | (0.0524) | - | - | (0.109) | (0.0467) |
| Constant | 8.622*** | 8.622*** | 10.05*** | 10.05*** | 9.309*** | 9.069*** |
| | (0.376) | (0.372) | (0.309) | (0.439) | (0.677) | (0.341) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.049 | 0.049 | 0.026 | 0.026 | | |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0253 | 0.0235 | 0.9596 | 0.9524 | 0.7737 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 10: ICRG (Corruption) and Growth: 1995-2012 period

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Corruption | 10.79 | 11.58 | 0.412 | 0.355 | -1.716 | -0.260 |
| | (7.415) | (7.157) | (1.122) | (0.940) | (1.822) | (1.259) |
| Exchange rate | -0.000930* | -0.000951*** | -0.000914*** | -0.000916** | -0.000894*** | -0.000761*** |
| | (0.000509) | (0.000356) | (0.000231) | (0.000451) | (0.000232) | (0.000179) |
| Terms of trade | 0.0870** | 0.0902** | 0.0440*** | 0.0441*** | 0.0385*** | 0.0235*** |
| | (0.0403) | (0.0431) | (0.00947) | (0.00977) | (0.0104) | (0.00810) |
| Investment | 0.0740 | 0.0703 | 0.0304 | 0.0268 | 0.0699** | 0.0962*** |
| | (0.0510) | (0.0538) | (0.0296) | (0.0447) | (0.0273) | (0.0162) |
| Human capital | -0.443 | -0.495 | - | - | 0.561** | 0.295*** |
| | (0.584) | (0.556) | - | - | (0.218) | (0.0820) |
| Initial Y | -1.555*** | -1.601*** | - | - | -0.893*** | -0.748*** |
| | (0.554) | (0.578) | - | - | (0.276) | (0.120) |
| Constant | -10.49 | -11.53 | - | - | 8.032*** | 4.628** |
| | (10.33) | (9.781) | - | - | (3.048) | (2.062) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -3.706 | -4.304 | 0.034 | 0.036 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.102 | -0.102* | 0.289** | 0.289 | 0.102 | -0.126*** |
| | (0.0675) | (0.0614) | (0.137) | (0.342) | (0.111) | (0.0447) |
| Diffuse | -0.0445 | -0.0445 | 0.848*** | 0.848** | 0.576*** | 0.124 |
| | (0.0973) | (0.115) | (0.158) | (0.415) | (0.137) | (0.0758) |
| Exchange rate | 1.09e-05 | 1.09e-05 | -1.10e-05 | -1.10e-05 | -8.40e-06 | 2.44e-05 |
| | (4.40e-05) | (3.77e-05) | (3.63e-05) | (2.32e-05) | (3.61e-05) | (3.14e-05) |
| Terms of trade | -0.00403** | -0.00403* | -0.000596 | -0.000596 | -0.00102 | -0.00152 |
| | (0.00192) | (0.00218) | (0.00148) | (0.000954) | (0.00148) | (0.00130) |
| Investment | 0.00289 | 0.00289 | 0.00432 | 0.00432 | 0.00497 | 0.00263 |
| | (0.00396) | (0.00373) | (0.00455) | (0.00842) | (0.00432) | (0.00266) |
| Human capital | 0.0722*** | 0.0722*** | - | - | 0.0798** | 0.0496*** |
| | (0.0156) | (0.0148) | - | - | (0.0399) | (0.00930) |
| Initial Y | 0.0674** | 0.0674*** | - | - | 0.0682 | 0.0680*** |
| | (0.0271) | (0.0239) | - | - | (0.0659) | (0.0164) |
| Constant | 1.416*** | 1.416*** | 1.895*** | 1.895*** | 1.091*** | 1.476*** |
| | (0.190) | (0.182) | (0.136) | (0.254) | (0.400) | (0.132) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.075 | 0.075 | 0.034 | 0.034 | - | - |
| No. of Countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0995 | 0.1587 | 0.7224 | 0.7337 | 0.1171 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 11 is concerned with the effect of law and order on growth. The data refer to the impartiality of the legal system and the popular observance of the law. This is significant for all non-fixed effects estimators, and the magnitudes of the coefficient are greater than for government stability. Table 12 reports results for bureaucratic quality related to the independence of the bureaucracy from political pressure. It is significant in the growth regressions when the FGLS and pooled methodology is used, and the magnitude of the coefficient is the highest (in the FGLS estimator) for all the ICRG political risk indicators. Table 13 shows the regression results for investment profile based upon country characteristics related to the risk of investment expropriation, ease of profit repatriation and payment delays. We do not get significant results for the effect of this variable on growth in our limited sample period, except in one instance (FGLS) where the sign is anomalously 'incorrect' (negative). Once again, as with the results for corruption, we may be dealing with a special period when the quality of governance in this regard may have been actually improving, as the signs of the first stage regression coefficients on point and diffuse are mainly positive. Note that of all ICRG indicators employed so far, investment profile is perhaps closest to the notion of economic institutions proposed by Acemoglu, Johnson and Robinson (2005).

The signs of the macroeconomic control variables are hypothesised as follows: the exchange rate (positive), terms of trade (positive), investment (positive), human capital (positive) and initial per-capita income (negative). The signs are sometimes at variance with what is predicted by theory, but we have to bear in mind that they act as controls on the contribution of institutions to growth, and on the impact of the pattern of exports on institutional development. The coefficient on the real exchange rate is positive and significant in some instances, particularly in the panel with the longer duration (1970-2010), pointing to classic 'Dutch' disease effects. In other words, there is a negative impact of exchange rate appreciation on price sensitive exports, and hence growth.

Table 11: ICRG (Law and Order) and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Law and order | 2.481** | 2.018** | 1.889 | 1.663 | 3.746* | 3.398*** |
| | (0.970) | (0.963) | (4.927) | (5.130) | (2.097) | (0.667) |
| Exchange rate | -0.000749*** | -0.000820** | -0.000921*** | -0.000911** | -0.000817*** | -0.000726*** |
| | (0.000253) | (0.000382) | (0.000237) | (0.000459) | (0.000269) | (0.000175) |
| Terms of trade | 0.0449*** | 0.0416*** | 0.0436*** | 0.0433*** | 0.0455*** | 0.0246*** |
| | (0.0111) | (0.0117) | (0.00960) | (0.00942) | (0.0114) | (0.00728) |
| Investment | 0.0365 | 0.0744* | 0.0461 | 0.0443 | 0.0235 | 0.0132 |
| | (0.0361) | (0.0442) | (0.0460) | (0.0668) | (0.0405) | (0.0238) |
| Human capital | 0.395*** | 0.361*** | - | - | 0.424*** | 0.421*** |
| | (0.0893) | (0.0906) | - | - | (0.146) | (0.0610) |
| Initial Y | -1.438*** | -1.153*** | - | - | -1.794*** | -1.694*** |
| | (0.265) | (0.332) | - | - | (0.530) | (0.198) |
| Constant | 1.701 | 0.500 | - | - | 0.244 | 1.144 |
| | (1.408) | (1.583) | - | - | (3.196) | (0.932) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -0.144 | -0.042 | -0.017 | -0.004 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.368*** | -0.368*** | 0.221* | 0.221 | 0.154 | -0.326*** |
| | (0.0912) | (0.0894) | (0.117) | (0.221) | (0.111) | (0.0460) |
| Diffuse | -0.115 | -0.115 | 0.109 | 0.109 | 0.0565 | -0.172*** |
| | (0.131) | (0.130) | (0.135) | (0.211) | (0.131) | (0.0578) |
| Exchange rate | -2.82e-05 | -2.82e-05 | 1.10e-06 | 1.10e-06 | 4.38e-07 | -2.04e-06 |
| | (5.93e-05) | (2.82e-05) | (3.10e-05) | (9.19e-06) | (3.10e-05) | (2.96e-05) |
| Terms of trade | -0.000936 | -0.000936 | -0.000296 | -0.000296 | -0.000330 | 0.000968 |
| | (0.00259) | (0.00260) | (0.00126) | (0.000617) | (0.00127) | (0.00112) |
| Investment | 0.0285*** | 0.0285*** | -0.00828** | -0.00828 | -0.00678* | 0.0231*** |
| | (0.00535) | (0.00502) | (0.00389) | (0.00948) | (0.00385) | (0.00239) |
| Human capital | -0.0241 | -0.0241 | - | - | 0.00709 | -0.0397*** |
| | (0.0210) | (0.0185) | - | - | (0.0751) | (0.00713) |
| Initial Y | 0.246*** | 0.246*** | - | - | 0.208* | 0.279*** |
| | (0.0366) | (0.0351) | - | - | (0.123) | (0.0141) |
| Constant | 1.179*** | 1.179*** | 3.238*** | 3.238*** | 1.750** | 1.100*** |
| | (0.257) | (0.238) | (0.116) | (0.258) | (0.723) | (0.0956) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.096 | 0.096 | 0.009 | 0.009 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0003 | 0.0010 | 0.7512 | 0.7102 | 0.1337 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 12: ICRG (Bureaucratic Quality) and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Bureaucracy quality | 4.332** | 3.908** | 2.093 | 2.066 | -0.133 | 4.281*** |
| | (2.072) | (1.994) | (9.265) | (7.718) | (6.569) | (0.722) |
| Exchange rate | -0.000752*** | -0.000835* | -0.000909*** | -0.000908** | -0.000908*** | -0.000726*** |
| | (0.000267) | (0.000434) | (0.000235) | (0.000452) | (0.000226) | (0.000176) |
| Terms of trade | 0.0491*** | 0.0462*** | 0.0450*** | 0.0451*** | 0.0430*** | 0.0281*** |
| | (0.0126) | (0.0124) | (0.0116) | (0.0116) | (0.0107) | (0.00736) |
| Investment | 0.0696** | 0.0998** | 0.0241 | 0.0192 | 0.0441 | 0.0918*** |
| | (0.0300) | (0.0392) | (0.0477) | (0.0557) | (0.0420) | (0.0156) |
| Human capital | -0.376 | -0.331 | - | - | 0.464 | -0.414*** |
| | (0.367) | (0.338) | - | - | (1.193) | (0.130) |
| Initial Y | -1.388*** | -1.189*** | - | - | -0.980 | -1.205*** |
| | (0.289) | (0.357) | - | - | (0.919) | (0.116) |
| Constant | 5.096*** | 3.536** | - | - | 6.052** | 3.645*** |
| | (1.114) | (1.801) | - | - | (2.891) | (0.675) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -0.269 | -0.197 | 0.022 | 0.022 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.368*** | -0.368*** | 0.221* | 0.221 | 0.154 | -0.326*** |
| | (0.0912) | (0.0894) | (0.117) | (0.221) | (0.111) | (0.0460) |
| Diffuse | -0.115 | -0.115 | 0.109 | 0.109 | 0.0565 | -0.172*** |
| | (0.131) | (0.130) | (0.135) | (0.211) | (0.131) | (0.0578) |
| Exchange rate | -2.82e-05 | -2.82e-05 | 1.10e-06 | 1.10e-06 | 4.38e-07 | -2.04e-06 |
| | (5.93e-05) | (2.82e-05) | (3.10e-05) | (9.19e-06) | (3.10e-05) | (2.96e-05) |
| Terms of trade | -0.000936 | -0.000936 | -0.000296 | -0.000296 | -0.000330 | 0.000968 |
| | (0.00259) | (0.00260) | (0.00126) | (0.000617) | (0.00127) | (0.00112) |
| Investment | 0.0285*** | 0.0285*** | -0.00828** | -0.00828 | -0.00678* | 0.0231*** |
| | (0.00535) | (0.00502) | (0.00389) | (0.00948) | (0.00385) | (0.00239) |
| Human capital | -0.0241 | -0.0241 | - | - | 0.00709 | -0.0397*** |
| | (0.0210) | (0.0185) | - | - | (0.0751) | (0.00713) |
| Initial Y | 0.246*** | 0.246*** | - | - | 0.208* | 0.279*** |
| | (0.0366) | (0.0351) | - | - | (0.123) | (0.0141) |
| Constant | 1.179*** | 1.179*** | 3.238*** | 3.238*** | 1.750** | 1.100*** |
| | (0.257) | (0.238) | (0.116) | (0.258) | (0.723) | (0.0956) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.096 | 0.096 | 0.009 | 0.009 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0002 | 0.0020 | 0.6497 | 0.6655 | 0.6299 | - |
| Hausman Test | | | | | YES | |

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 13: ICRG (Investment Profile) and Growth: 1995-2012

| Variables | Pooled IV OLS | Pooled IV GMM | Panel IV: FE | IV GMM: FE | IV Panel: RE | IV FGLS: RE |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Second stage: Institutions and economic growth relationship | | | | | | |
| Investment profile | 1.449 | 1.808 | 2.827 | 2.870 | 2.414 | -3.915*** |
| | (1.733) | (1.642) | (8.456) | (8.021) | (12.94) | (0.829) |
| Exchange rate | -0.000410 | -0.000329 | -0.000951*** | -0.000950* | -0.000786 | -0.00175*** |
| | (0.000590) | (0.000637) | (0.000359) | (0.000531) | (0.000686) | (0.000273) |
| Terms of trade | 0.0515** | 0.0532*** | 0.0489** | 0.0490** | 0.0500 | 0.00952 |
| | (0.0201) | (0.0198) | (0.0216) | (0.0214) | (0.0405) | (0.00792) |
| Investment | 0.0608 | 0.0783 | -0.0139 | -0.0144 | -0.000292 | 0.147*** |
| | (0.0624) | (0.0652) | (0.146) | (0.134) | (0.274) | (0.0186) |
| Human capital | 0.324*** | 0.288*** | - | - | 0.371 | 0.318*** |
| | (0.105) | (0.101) | - | - | (0.442) | (0.0561) |
| Initial Y | -1.770* | -1.768* | - | - | -2.483 | 1.430*** |
| | (1.075) | (1.061) | - | - | (8.025) | (0.479) |
| Constant | 0.934 | -2.006 | - | - | -0.0698 | 17.18*** |
| | (4.116) | (3.819) | - | - | (32.15) | (2.788) |
| Observations | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 | 1,030 |
| R-squared | -0.260 | -0.486 | -1.157 | -1.193 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| First stage: Institutions and natural resource dependency relationship | | | | | | |
| Point | -0.155 | -0.155 | 0.133 | 0.133 | -0.0369 | 0.0135 |
| | (0.164) | (0.146) | (0.344) | (0.374) | (0.269) | (0.116) |
| Diffuse | 0.00810 | 0.00810 | 0.113 | 0.113 | 0.00266 | 0.387** |
| | (0.236) | (0.245) | (0.398) | (0.386) | (0.335) | (0.172) |
| Exchange rate | -0.000298*** | -0.000298** | 1.15e-05 | 1.15e-05 | -3.91e-05 | -0.000258** |
| | (0.000107) | (0.000118) | (9.13e-05) | (2.64e-05) | (9.05e-05) | (0.000132) |
| Terms of trade | -0.00862* | -0.00862* | -0.00191 | -0.00191 | -0.00269 | -0.00293 |
| | (0.00466) | (0.00520) | (0.00372) | (0.00369) | (0.00373) | (0.00370) |
| Investment | 0.0344*** | 0.0344*** | 0.0165 | 0.0165 | 0.0202* | 0.0146** |
| | (0.00961) | (0.00896) | (0.0114) | (0.0103) | (0.0107) | (0.00718) |
| Human capital | 0.0154 | 0.0154 | - | - | 0.0240 | 0.0134 |
| | (0.0378) | (0.0375) | - | - | (0.0905) | (0.0256) |
| Initial Y | 0.625*** | 0.625*** | - | - | 0.622*** | 0.587*** |
| | (0.0657) | (0.0709) | - | - | (0.150) | (0.0543) |
| Constant | 2.337*** | 2.337*** | 7.110*** | 7.110*** | 2.499*** | 2.984*** |
| | (0.461) | (0.501) | (0.342) | (0.310) | (0.914) | (0.399) |
| Observations | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| R-squared | 0.160 | 0.160 | 0.003 | 0.003 | - | - |
| No. of countries | - | - | 68 | 68 | 68 | 68 |
| Sargan-Hansen test | 0.0000 | 0.0001 | 0.9440 | 0.9416 | 0.4727 | - |
| Hausman Test | | | | | YES | |

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

## 4. Conclusions

We have attempted to make a contribution to the political economy of the resource curse by analysing how different patterns of export and resource dependence impact on economic growth via its effect on institutional quality. Institutions that are regarded to be crucial to growth are not treated as exogenous variables, but made endogenous to resource (export) dependence. We also utilise a variety of panel econometric techniques as robustness checks for our empirical findings. Remaining within the constraints of data availability, our analysis covers a lengthy cross-country panel from 1970 to 2010, with a sub-panel examining more recent experiences of the resource curse.

We also employ a variety of institutional indicators to examine which ones matter more for economic progress. We distinguish between political and economic institutions in the spirit of Acemoglu, Johnson and Robinson (2005). In the former category we make use of the well known Polity indicators of democracy-autocracy, as well as constraints on the executive data. In the latter category we deploy the rarely employed economic freedom index, as well as the better known ICRG indices which only begin in the 1980s. These last two sets of institutional data may be dubbed as governance indicators. It may be argued that political institutions have more to do with process, and governance indicators are relatively closer to outcomes of policy choices (Boschini, Petterson and Roine, 2013). Yet, several of the ICRG indicators and the economic freedom index also pertain to process.

Our results indicate that governance matters more in determining economic progress compared to democratic development in the longer term. This means that economic institutions are more salient. After all, a well managed authoritarian state may function better in some cases than the imperfect democracies which abound the developing world. Within political institutions, constraints on the executive may be more important than the degree of democracy, as the former may be more salient to engendering more accountable and less corrupt government. In many ways, constraints on the executive are closer to governance than political processes. We also find that the more outcome based governance indicators such as corruption and investment profile are less significant than more process led institutions of governance such as government stability, the quality of the bureaucracy, law and order, as well as the conduct of tax, trade, fiscal and monetary policies. Despite the all important political economy (institutional) channel via which the resource curse impacts on growth, traditional 'Dutch' disease mechanisms via the deleterious effect of real exchange rate appreciation on exports and growth remain significant in some instances.

Interestingly, there is evidence of a reversal of the institutional decline engendered by resource dependence in the recent post cold war era. The end of super power rivalry, and the pressure exerted by (bilateral and multilateral) donors not only ushered in a new (third) wave of democratic development, but also may have improved certain governance indicators. Our results suggest that the impact of resource based exports on Polity, as well as the ICRG indicators pertaining to corruption and investment profile (containing the risk of expropriation) tends to be positive rather than negative, particularly for diffuse type exporters in the 1995 to 2012 period. Only time will tell whether these improvements are reflective of the temporary palliatives administered by outside powers, or more long lasting improvements that are truly *sui generis*.

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**Appendix** Table A.1: List of countries

| First Panel of countries (63) over 1970-2010 period | | | |
|---|---|---|---|
| Algeria | Dominican RP | Kenya | Philippines |
| Argentina | Ecuador | Malawi | Senegal |
| Benin | Egypt | Malaysia | Sierra Leone |
| Bolivia | El Salvador | Mali | South Africa |
| Botswana | Fiji | Mauritius | Sri Lanka |
| Brazil | Gabon | Mexico | Syria |
| Burundi | Ghana | Morocco | Thailand |
| Cameroon | Guatemala | Myanmar | Togo |
| Central Africa | Guyana | Nicaragua | Trinidad & Tobago |
| Chad | Haiti | Niger | Tunisia |
| Chile | Honduras | Nigeria | Turkey |
| Colombia | India | Oman | Uganda |
| Congo | Indonesia | Pakistan | Venezuela |
| Congo DR | Iran | Papua NG | Zambia |
| Costa Rica | Jamaica | Paraguay | Zimbabwe |
| Cote d'Ivoire | Jordan | Peru | |
| **Second panel of countries (86) over 1995-2012 period** | | | |
| Algeria | Ethiopia | Madagascar | Sierra Leone |
| Angola | Gabon | Malawi | Somalia |
| Argentina | Gambia | Malaysia | South Africa |
| Bahrain | Ghana | Mali | Sri Lanka |
| Bangladesh | Guatemala | Mexico | Sudan |
| Bolivia | Guinea | Mongolia | Suriname |
| Botswana | Guinea-Bissau | Morocco | Syria |
| Brazil | Guyana | Mozambique | Tanzania |
| Burkina Faso | Haiti | Myanmar | Thailand |
| Cameroon | Honduras | Namibia | Togo |
| Chile | India | Nicaragua | Trinidad & Tobago |
| China | Indonesia | Niger | Tunisia |
| Colombia | Iran | Nigeria | Turkey |
| Congo | Iraq | Oman | UAE |
| Congo, DR | Jamaica | Pakistan | Uganda |
| Costa Rica | Jordan | Panama | Venezuela |
| Cote d'Ivoire | Kenya | Papua New Guinea | Vietnam |
| Cuba | Korea, DPR | Paraguay | Yemen |
| Dominican Republic | Kuwait | Peru | Zambia |
| Ecuador | Lebanon | Philippines | Zimbabwe |
| Egypt | Liberia | Saudi Arabia | |
| El Salvador | Libya | Senegal | |

Table A2: List of Variables, Definitions and Sources

| Name and Definition | Source |
|---|---|
| **Growth**: GDP per capita growth (annual %) | World Development Indicators (WDI), The World Bank. |
| **Initial Income**: GDP per capita (constant 2005 US$) in the first period of the panel | |
| **Investment**: Percentage share of gross fixed capital formation in GDP | |
| **Terms of trade**: net barter terms of trade index, exports over imports (2000 = 100) | |
| Exchange rate: real effective exchange rate index (2010 = 100) and official exchange rate | |
| **Human Capital**: Mean years of schooling for the population aged above 15 years. | Available at http://www.barrolee.com/ [accessed on 1 December 2014] |
| **Export** data on two principal commodities; data on international trade (export) by items. | UNCTAD statistics available at http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sRF_ActivePath=p,15912&sRF_Expanded=,p,15912[accessed 1 December 2014] |
| **Polity 2** gives the combined democracy and autocracy score of between -10 and +10, with +10 being the best (democracy) and -10 the worst (autocracy). | Polity IV dataset available at http://www.systemicpeace.org/inscrdata.html [accessed on 01 December 2014] |
| **Executive constraints** reflect the extent of institutional constraints on the decision-making powers of the chief executive (individual or collective), coded on a scale of 1 to 7 where (1) refers to unlimited executive authority, and (7) refers to executive parity or subordination. | |
| **The Economic Freedom Index (EFI)** consists of five major components: (i) size of government and taxation; (ii) private property and the rule of law; (iii) sound money; (iv) trade regulation and tariffs; and (v) regulation of business, labor and capital markets. This index has a maximum score of 10. | http://www.freetheworld.com/release.html [accessed on 01 December 2014] |
| International Country Risk Guide-ICRG Data | |
| ICRG Composite Index: The *International Country Risk Guide* (*ICRG*) rating comprises 22 variables in three subcategories of risk: political, financial, and economic. A separate index is created for each of the subcategories. The Political Risk index is based on 100 points, Financial Risk on 50 points, and Economic Risk on 50 points. The total points from the three indices are divided by two to produce the weights for inclusion in the composite country risk score. The composite score ranges from zero to 100. | International Country Risk Guide (ICRG) dataset; Political risk component, Howel (2013) |
| Government Stability: this is an assessment both of the government's ability to carry out its declared programme(s), and its ability to stay in office. It is the sum of three subcomponents (Government Unity, Legislative Strength and Popular Support), each with a maximum score of four points, making the total maximum and the minimum scores 12 and 0 respectively. | |
| Corruption: this is an assessment of corruption within the political system. The most common form of corruption met directly by business is financial corruption in the form of demands for special payments and bribes. Although the variable takes this corruption into account, it is more concerned with systemic corruption in the form of excessive patronage, nepotism, job reservations, 'favour-for favours', secret party funding, and suspiciously close ties between politics and business. The maximum score is 6, while the minimum is 0. | |

| Name and Definition | Source |
|---|---|
| **Name and Definition** | **Source** |
| Law and Order: this considers two elements, the strength as well as impartiality of the legal system, and popular observance of the law. The highest score is 6 while the lowest is 0. | International Country Risk Guide (ICRG) dataset; Political risk component, Howel (2013). |
| Bureaucracy Quality: refers to the strength and expertise to govern without drastic changes in policy or interruptions in government services. A higher score indicates that the bureaucracy tends to be somewhat autonomous from political pressure. The score for this indicator ranges from 0 to 4 where higher value denotes better quality. | |
| Investment Profile is a measure of factors affecting the risk to investment that are not covered by other political, economic and financial risk components. It is the sum of three subcomponents (contract viability or expropriation, profits repatriation, and payment delays), each with a maximum score of four points. The total maximum and the minimum scores are 12 and 0 respectively. | |