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Preliminary conclusions on institutions and economic performance

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This working paper is part of the research programme on 'Institutions, Governance and Long-term Economic Growth', a partnership between the French Development Agency (AFD) and the Maastricht Graduate School of Governance (Maastricht University – UNU-Merit). The research builds on the Institutional Profiles Database IPD, jointly developed by AFD and the French Ministry of the Economy since 2001.

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AFD-MGSoG/UNU-Merit Working Paper Series on
« Institutions, Governance and Long term Growth »

In 2010, the French Development Agency (AFD) initiated a partnership with the Maastricht Graduate School of Governance (Maastricht University - UNU-Merit) with a view to exploring the conceptual and econometric relationships between institutions and long-term growth. As a development bank with a long-term lending horizon, AFD is particularly interested in better understanding the determinants of countries' long term economic, social, and political trajectory.

AFD has thus developed a programme on "Institutions, Governance, and Long-term Growth" dealing with the five following dimensions:

(i) Measuring institutions and discussing the meaning of such measures, notably through the Institutional Profiles Database;
(ii) Testing the econometric relationship between institutional measures and long term growth;
(iii) Exploring through a series of country case studies the historical relationship between processes of economic accumulation, forms of political organisation, and social cohesion;
(iv) Discussing conceptual frameworks for making sense of the interaction between political, social and economic forces in the process of development;
(v) Developing methodologies for political economy analyses.

The MGSoG/UNU-Merit team is involved in the five dimensions with a particular focus on the first two. Its primary objective is to explore the Institutional Profiles Database jointly developed by AFD and the French Ministry of the Economy since 2001. Institutional Profiles Database is unique by its scope (about 350 elementary questions pertaining to all institutional dimensions covering 148 countries in 2012), its entirely free access, and its ambition to incorporate the most recent theoretical advances in the field of political economy.

The present series intends to convey the results of our ongoing research, and in so doing to reflect the wealth of issues that can be fruitfully addressed from an "institutionalist" perspective. We hope that readers will find these papers stimulating and useful to develop their own understanding and research.

Nicolas Meisel (AFD)
Adam Szirmai (MGSoG/UNU-Merit)

For more information on the programme, please visit our websites:
http://www.maastrichtuniversity.nl/web/Schools/MGSoG/ProjectPages/InstitutionalProfilesDatabase.htm
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Preliminary Conclusions on Institutions and Economic Performance*

Denis de Crombrugghe† and Kristine Farla‡

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Working Paper

Abstract

Using institutional indicators describing 122 countries, we conduct an exploratory study highlighting which institutional characteristics differ across countries with different levels of income and rates of growth. We describe a country's institutions by the degree of formalization of its regulations, the depersonalization of their implementation, and by the degree of control and intervention of the state. Our findings reveal that the variation in state control and intervention decreases along with countries formalization of regulations. This phenomenon may be explained by institutional convergence, by endogeneity in the data and/or by bias. In addition, we find evidence of a strong relationship between institutions and income levels; however, we find no such evidence on growth rates. We find mixed evidence for a relationship between institutions and growth volatility.

Keywords: Institutions, Economic performance, Growth
JEL Classification: O11, O43

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1 Introduction

This paper presents the results of an exploratory study on the relationship between a country's institutions and its economic performance. This document builds on the analysis of Meisel and Ould Aoudia (2008) and confirms their results on the basis of the latest edition of the Institutional Profile Database (IPD)[1] To the best of our knowledge, Meisel and Ould Aoudia are the first to conduct exploratory analysis on institutional variation with the main objective to 'let the data speak'. Our focus is on describing the institutional variation between countries from different income classes and with different growth rates. Our aim is to better understand the differences in countries institutions, and whether these differences are related to economic performance.

The key contribution of our research is that we pay close attention to institutional measurements and to the interpretation of various disaggregated institutional indicators. We construct institutional indicators from a rich raw dataset on institutions. Following the approach of Meisel and Ould Aoudia (2008), we aggregate, not on the basis of predefined theory, but with the aim to identify institutional characteristics that differ most across countries.

Academics generally agree that institutional development is important for stimulating income and growth. Institutions structure the incentives that affect behaviours and provide a framework for economic exchanges (North, 1990). Which institutional characteristics set incentives has been a frequent topic of discussion. Rodrik (2000, p. 4) asked "which institutions matter" and discussed "five types of market-supporting institutions: property rights; regulatory institutions; institutions for macro-economic stabilization; institutions for social insurance; and institutions of conflict management." Dixit (2009, p. 5) described three institutional prerequisites that "support economic activity and economic transactions:" security of property rights, enforcement of contracts, and collective action. Nevertheless, the functional form, causality, and consistency of the institutions - performance relationship are debated by scholars (Jones and Romer, 2009; Easterly and Levine, 2001; Rodrik, Subramanian, and Trebbi, 2004). For example, Khan (2004) finds that a small group of countries that experienced higher than average growth rates, rank low in development with regard to government indicators.

We explore the possibility of a multi-dimensional perspective of institutions. The aggregation method used in this study allows for the formation of multiple dimensions of institutional conceptions. We find two main insti-

[1] Meisel and Ould Aoudia (2008) use a different aggregation technique (see footnote 13) on IPD data from 2006 which includes 85 countries. More information about the IPD 2009 is in de Crombrugghe, Farla, Meisel, de Neubourg, Ould Aoudia, and Szirmai (2010).

tutional axes. The first and most dominant axis is interpreted as the axis of the 'formalization of regulations'. The second axis we interpret as the axis of 'state control and intervention'. We find that the variation in the degree of control and intervention by the state decreases along with countries formalization of regulations.

Next, these indicators are compared with data on economic performance, to assess whether institutional differences are related to variations in economic performance. This research is closely related to the work of Huynh and Jacho-Chavez (2009). On the basis of nonparametric methods, the authors analyze the governance-growth relationship using the World Bank governance indicators and conclude that there are nonlinearities in the relationship and that only three of the six indicators are significantly related to growth. Similarly to research by Lee and Kim (2008) we propose that different institutional characteristics matter at different stages of economic performance.

Our data reveals an institutionally heterogeneous world with complex relationships between institutional indicators, income levels, growth rates, and growth volatility. Our empirical results do support the existence of a strong relationship between institutions and *income level*. However, in contrast to the results of Huynh and Jacho-Chavez (2009) and Lee and Kim (2008), we find only weak empirical evidence for a positive relationship between institutions and *growth*. We find mixed evidence for the existence of a relationship between growth *volatility* and countries' institutional development.

Our research is highly relevant for economic and political actors and provokes a series of questions: which specific institutional characteristics are important to stimulate growth and to attract investment, are institutions exportable, and should low income countries mimic the institutions of high income countries as models for institutional development?

2 Institutional Data

This study is conducted using the Institutional Profiles Database (IPD) 2009 that contains cross-sectional information about 123 countries: 24 developed countries, 30 Sub-Saharan African countries, 16 Middle East and North African countries, 18 Latin American and Caribbean countries, 17 Central Asian and European countries, and 18 developing countries in Asia (see table 3 for a country list).[2] The analysis that follows only uses 122 countries.

[2]IPD can be downloaded from the websites of the AFD, Maastricht University, and CEPII.

Serbia, one of the countries in the IPD, is excluded from our analysis because we lack economic performance data for this country.[3]

IPD 2009 includes 367 elementary variables that purport to explain the role that institutions play in development. The IPD is based on a survey conducted by the French Ministry for the Economy, Industry and Employment (MINEIE) and the French Development Agency (AFD) in the countries covered. The Institutional Profiles survey was sent to the economic mission offices of the MINEIE and to the local agencies of AFD present in the surveyed countries.[4] The surveys are subjective and the results depend on the evolving views of the questionnaire respondents. IPD does not incorporate external data sources.

The survey results are numerical elementary variables in the form of ordinal scales. Two types of scales are used: Coding from 1 to 4 when the question relates to the assessment of a phenomenon, and coding from 0 to 4 when the question relates to the existence of a particular institutional characteristic (with 0 indicating non-existence) and the quality level of its application (where 1 corresponds to low quality of application and 4 to high quality of application).[5] In some particular situations, when an institutional characteristic is/was not applicable to a given country, the questionnaire elementary variables required recoding (see section 6.3 in the appendix for the list of elementary variables that were recoded).

Benefits of working with IPD include the following: the IPD 2009 includes raw data about a wide range of governance characteristics.[6] IPD has a wide geographical coverage and the raw data can be used to identify the institutional aspects that differ most across countries. Following the works of Meisel and Ould Aoudia (2008), the IPD data is fit to study countries at different stages of development. The variables describe "Institutions that generate confidence between agents and organizations through arrangements appropriate to the level of development of each country (...) and the political economy of social regulation systems" (Meisel and Ould Aoudia, 2008, pp 45). IPD also contains detailed information on specific concepts from the New Institutional Economics (NIE), incorporating the recent theoretical

[3]Serbia has country code YUG in IPD.

[4]The original questionnaire was in French.

[5]Survey questions with a scale of 0 to 4, 0 representing the non-existence of a phenomenon, increase the variability of the data (unless the question has no 0 response).

[6]Unlike the IPD, the World Wide Governance Indicators are based upon datasets that overlap and are strongly correlated among themselves. These indicators build on 35 different datasets, from 33 different organizations including the IPD 2006. Since 2008, the World Bank Institute has been using a part of the IPD (from the IPD 2006 version) in producing the Worldwide Governance Indicators (WGI) (Kaufmann, Kraay, and Mastruzzi, 2009). The average weight of IPD in the WGI is 7.2%, out of 33 different sources.

contributions in the field. IPD allows analyzing possible multi-dimensional relationships and for the documentation of heterogeneity in countries' institutional development. IPD contains de-facto information about the functioning of institutions, and contains de-jure information.[7] The de-jure information includes information about the basic existence of a given institutional form, and the extent to which legal arrangements are transcribed. Most of the IPD survey questions are de-facto descriptions of states' functioning that do not assess de-jure format, for example about states' degree of capacity, coordination, predictability, effectiveness, respect for law, respect for tradition, control over agents, coverage. The de-facto information is particularly important because the gap between de-facto and de-jure differs between countries and sectors, impeding the comparison of countries.

3 Aggregation Method

The following section presents the methodology used to aggregate the raw IPD data and to construct the institutional indicators. We aggregate with the objective of reducing the dataset to gain comprehension. We use 122 country observations and 333 elementary variables, in total 40,626 data points.[8] By aggregating the data, information (variation) is lost; we aim to preserve the maximum information.

In the first step of aggregation we reduce the number of elementary vari-

[7]Some of the survey questions can be interpreted both as de-facto and as de-jure questions.

[8]The count of 333 elementary variables excludes 34 survey questions that were judged to be defective. Accordingly, in the sequel of the paper, no use is made of the following 17 subheadings: Frequency of bankruptcy over the last five years (a605); Importance of economic zones (b301); Privatizations in the non-financial sector since 2006 (b400); Nationalizations in the non-financial sector since 2006 (b401); Implementation of the privatization programme(non-financial sector) (b402); Single exchange rate (b405); Diversity of land tenure right systems (b606); Government recognition of the diversity of land right systems (b607); Demand for land (b610); Land tenure and large investors(b611); Joint ventures (b802); Foreigner access to land (b803); Privatization in the financial sector since 2006 (c400); Nationalization in the financial sector since 2006 (c401); National sovereign wealth funds: policy and timeline (c502); Financial system regulation reforms in the last three years (c705); Strikes (d701). Reasons for removal were the following. Some of these variables were suspected to contain biased responses, to be interesting only for a small selection of countries, to describe institutional change without considering the point of departure. Some of the elementary variables suffer from logical inconsistency. For example, question B400 'Privatizations/nationalizations in the non-financial sector since 2006' is followed by B402 'Implementation of the privatization programme (non-financial sector)'. If the score for B400 is 0 (no privatization), the score given by a respondent to all the elementary variables in B402 should also be 0.

ables from the responses collected in the survey to 116 items.[9] We follow the original structure of the survey: the questions (in 4-digit code) are initially grouped under a common heading depending on their thematic proximity, resulting in a smaller number of indicators (in 3-digit code). For example, the sub-group A300 (3-digit) 'Transparency of public economic action' is formed by the aggregation of these six elementary elementary variables (4-digits): A3000, A3001, A3002, A3003, A3004 and A3005 (see section 6.2 for an extract of the questionnaire). Ordinary (Pearson) correlations, as well as polychoric correlations (taking into account the ordinal nature of the data), are calculated for each of these sub-groups to verify that the 4-digit elementary variables are positively correlated. In the case elementary variables do not have a positive correlation the elementary variables are not aggregated and remain separate variables. The elementary variables A8010, A8011, A8012, and A8013 are not aggregated under the sub-heading 'The countries' political relations with the leading global or regional players' (A801) because of their nature. Some elementary variables are aggregated by multiplication (see section 6.4).

The data is aggregated by taking the weighted mean of the elementary variable scores per country. The weights are based on the standard deviations of the scores across countries. A 4-digit elementary variable with an identical score for all the countries (indicating it does not discriminate between countries) has a zero weight in the aggregated indicator. The better an elementary variable discriminates between countries, the higher its weight is in the aggregated index. Thus, this methodology uses the dispersion of the variables, so as to give more weight to those elementary variables that better differentiate between countries.[10]

Finding an appropriate structure to analyze and aggregate the institutional data is a main conceptual challenge. We choose to aggregate the data using the structure offered by the IPD database because it differentiates between 'institutional functions' that are relevant to the public sector and that are relatively homogeneous (Meisel and Ould Aoudia, 2008). The institutional functions offer a structural division, that corresponds to different lines

[9] We distinguish between the variables in the non-aggregated dataset and the variables in the dataset resulting from the first level (partial) aggregation by retaining the name 'elementary variable' for the former, and labeling the latter as 'items'.

[10] The method of aggregation has also been used to aggregate previous versions of the IPD database (Meisel and Ould Aoudia, 2008). The formula to aggregate is: [input of country 'X' for elementary variable 'A' * (standard deviation for all countries of elementary variable A) + input country 'X' for elementary variable 'B' * (standard deviation for all countries of elementary variable 'B')] / (standard deviation elementary variable 'A' + standard deviation elementary variable 'B').

of authority and control under which states organize society. The IPD structure offers nine institutional functions, each containing a battery of variables: (1) Political institutions, (2) Safety, law and order, (3) Public governance, (4) Markets' operating freedom, (5) Coordination, (6) Security of transactions and contracts, (7) Regulations and corporate governance, (8) Openness to the outside world, (9) Social cohesion. Together the functions represent the social-political-economic arena of a country's institutions. The institutional functions and observations are given equal weight in order to preserve the chosen structure. Thereby, the institutional functions help to provide a balanced framework for analysis when quantifying the broader institutional framework.

We further aggregate the items using principal component analysis (PCA), a method of variable reduction that retains the maximum variation from the raw data.[11] A PCA is run on the set of aggregated items that belong to each institutional function. The results of the PCA are indicators, also called principal components (PCs), that summarize the information of the IPD database on national institutional profiles. The first three PCs are retained for each function (9 functions x 3 PCs).

The PCs are orthogonal variables and each PC contains information about a specific dimension of an institutional function that we interpret on the basis of the loadings, the first three containing the largest variation across countries. We choose to retain three PCs per function after consideration of the eigenvalues of the PCs, the inflection points of their graphs, the variance explained by the first three PCs, and the loadings of the PCs.[12]

The first PCs have the highest loadings and the highest variance. For all functions, the variation explained by the first three principal components ranges from 61% to 94% of the total variation. By retaining three PCs, instead of only one or two PCs for each function, it is less likely that important information is excluded. Despite the differences in the number of items used for each PCA, we treat the functions separately and avoiding giving them weights until the next level of PCA. Thereby, the structure of the institutional functions is respected giving equal importance to each institutional

[11]This frequently used data aggregation technique is documented in guidelines about the construction of composite indicators (OECD, 2005).

[12]The rotation of axis is a statistical technique that may improve the ease of interpretation of the PCA results. The institutional functions are tested under the varimax rotation method, which keeps the PCs orthogonal, and under the oblique oblimin rotation method that does not keep the PCs orthogonal. The results of the oblique oblimin generally produce PCs with a low correlation. The rotation space is set for the first three PCs because these contain most of the information. The results do not differ substantially and support the interpretation found in the PCAs without rotation, because of this, the non-rotated PCs are utilized for further analysis.

function; data is reduced systematically.

In order to summarize the broader institutional framework, the 27 PCs are further aggregated. We run a second PCA on the 27 PCs.[13] The resulting first two PCs are explored in this document.

The indicators are orthogonal and each indicator provides very different information about the institutional characteristics of countries.[14] We retain only the first two PCs because these are the only PCs for which we find a clear interpretation. The interpretations of the aggregated data — the 27 PCs describing institutional functions and the final two PCs summarizing the countries' institutions — are described in the following sections.

4 Results

4.1 Interpreting Institutional Functions

The institutional functions represent the social-political-economic arena of a country's institutions. The results from the PCA made for each institutional function are three PCs per function. These PCs cover a wide spectrum of institutional aspects that describe a country's institutional landscape. The PCs are presented in table 1. It should be noted that, the descriptions of the scales and poles are tentative interpretations of the PCs. The countries are projected on the indicators, as possessing either a high or a low degree of the institutional component (e.g., a high degree of democracy and civil liberties). The country codes mentioned in parentheses indicate which countries are positioned at the very end of the axes. Interpreting and naming the PCs is complex; the most relevant item or pattern is extracted on the basis of marginal differences in loadings. The PC loadings on an item are determined by the variation in the country's scores of the item.

[13] PCA on the disaggregated elementary variables/items results in PCs that are difficult to interpret; the loadings of PCs are low and are relatively more similar. Such method has been used in Meisel and Ould Aoudia (2008). In this study we trace the underlying items that explain the PCs following a predefined structure of institutional functions. We maintain the assumption that this structure is relatively homogeneous. Despite the difference in methodology, the results of this study confirm the results of Meisel and Ould Aoudia (2008).

[14] The aggregation method used in these analyses has been compared with alternative methodologies. Different methods tested include: retaining different number of PCs, retaining PCs with eigenvalue larger than 1, PCA using covariance, and PCA using a reduced set of indicators, further aggregation using simple and weighted mean. The different methods did not yield different interpretations of the data. The different methods do result in indicators that capture different percentages of variance of the data. We choose to work with a method that maintains the IPD structure and maximizes the variance of the data.

To understand the significance of table 1, it is important to remember that these final results are based on an aggregation of 333 survey questions on institutions. The items with high variation across counties are retrieved. For example, we find that there is a high variation in the security and control over legal armed forces.

Table 1: Principal Components of IPD

Institutional Function	Name of Scale	High Pole	Low Pole
1 Political institutions (11⋄)	PC1: Democracy and civil liberties (63%)	Democracy and civil liberties (CAN, AUS, NOR)	No or little democracy and civil liberties (QAT, SYR, AZE)
	PC2: Political legitimacy - authorities capacity to reach out to society & population acceptance of authority / Right to strike and organize union activity (13%)	High political legitimacy / No right to strike (ARE, SAU, CHN)	Disputed political legitimacy / Right to strike, collectively bargain and organize trade unions (TCD, ZWE, TGO)
	PC3: Autonomy of local authority and political stability (7%)	High political stability (KWT, MLT, BWA)	High level of decentralized authority (ZWE, ZMB, UGA)
2 Safety, law and order (4⋄)	PC1: Public security and security and control of political authority over legal armed forces (26%)	Control of violence (DNK, SWE, CHE)	Lack of control of violence (SDN, CAF, PAK)
	PC2: Control of state violence by NGOs (21%)	Control of violence (LBY, VNM, GHA)	Lack of control of violence (TUR, PAK, ISR)
	PC3: International security / tensions (18%)	No tensions (CIV, GTM, TGO)	Major tensions (ISR, ETH, USA)
3 Public Governance (17⋄)	PC1: Corruption and functioning of legal system (51%)	Control and effectiveness (NLD, CAN, DNK)	Lack of control and ineffectiveness (ZWE, ZAR, HTI)
	PC2: Control over organizations. Organization operational autonomy and freedom to create new organizations (11%)	(Lack of state control over /) total freedom and autonomy (UKR, ROM, NGA)	No freedom and autonomy (CUB, ONM, SGP)

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	PC3: Influence of major economic stakeholders on public policy and the use of income from natural resources (6%)	Frequent influence (LBY, JPN, IRL)	Very rare influence (CUB, CHL, CMR)
4 Markets operating freedom (5◇)	PC1: Free functioning of markets (42%)	No controls and administered rates (DNK, FIN, CAN)	Controls and administered rates (IRN, LBY, YEM)
	PC2: Flexicurity in the labour market (21%)	No or precarious employee security (NGA, TCD, ROM)	Practice of employee security in profit making public sector (ARE, QAT, UKR)
	PC3: Re-training of employees (16%)	High effectiveness (TAI, ETH, DNK)	No measures (CYP, ARE, HKG)
5 Coordination (18◇)	PC1: Strategic planning and vision for growth (60%)	High priority (CAN, IRL, DNK)	Low priority (CAF, COG, AZE)
	PC2: Government strategic vision / outlook of young nationals (7%)	Strong vision and positive outlook (OMN, ARE, CHN)	Lack of vision / high potential migration (TAI, BEL, LBN)
	PC3: Culture of cooperation and dialogue structures / competence of bank executives (5%)	Little or no cooperation and dialogue (CHL, LTU, SAU)	Strong cooperation and dialogue / high competence (ETH, IRN, HKG)
6 Security of transactions and contracts (20◇)	PC1: Contracts, transactions and property rights (55%)	High security and protection (AUT, NLD, GBR)	Little or no security and protection (COG, ZWE, KHM)
	PC2: Transactions and property protection / respect for (traditional) land property (8%)	Strong enforcement / respect (VEN, CAF, CZE)	Lack of enforcement / respect (QAT, AZE, MNG)
	PC3: Property contracts (6%)*	High importance of *public* contracts (ZAR, DZA, AUT)	Weak enforcement (KWT, GHA, LBN)
7 Regulations and corporate governance (14◇)	PC1: Market regulations (47%)	Strong regulations (CAN, DNK, AUT)	Few / weak implementation of regulations (QAT, IRN, SYR)
	PC2: Wage bargaining / importance of public shareholders (9%)	High individual wage bargaining / high importance of public shareholders (CUB, LBY, NOR)	Low importance of public shareholders (HTI, BGR, HKG)

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	PC3: Land development (economic activity & housing) policy (8%)	Effective policy (DEU, EST, BGD)	No policy (OMN, MYS, UZB)
8 Openness to the outside world (10◇)	PC1: Trade and financial market openness to foreign investors (34%)	High openness (EST, GBR, NLD)	Closed economy (IRN, SYR, CUB)
	PC2: International relations with Japan, China, and the USA (16%)*	Close relations (KOR, DEU, HKG)	Weak relations (HTI, ZWE, BRA)
	PC3: Relations with neighboring countries / International relations with China (10%)*	Close relations (GHA, MNG, AUS)	Strong regional ties (DOM, SVN, SYR)
9 Social cohesion (17◇)	PC1: Social security regulations / traditional solidarity and social network relationships (49%)	Formalized regulations (CAN, FIN, NZL)	Personalized systems of solidarity (COG, NPL, CAF)
	PC2: Nationalistic feeling / social inclusion (9%)	Strong sense of national identity & substantial seggregation (QAT, KWT, OMN)	No strong nationalistic feeling (ITA, VEN, BEN)
	PC3: Micro lending / nationalistic feeling (7%)*	No strong nationalistic feeling (COG, CAF, SAU)	Large scale lending (PHL, COL, MNG)

* These indicators have a weak interpretation

◇ In parentheses are the number of items used to run the PCA

Institutional Functions and Variation between Income Classes

We construct four income classes, low income, lower-middle and upper-middle income, and high income, using real GDP per capita data from the Penn World Tables (PWT) 6.3.[15] The GDP is calculated using the chain series method, constant prices with 2005 as the base year. We use data from 1993, the earliest period available for our sample, to minimize the endogenous nature in the data. The income class limits are the 25th, 50th, and 75th percentiles of real GDP per capita in 1993, the earliest period available for our sample.[16] Table 2 provides more details about the income classes. Table

[15]We construct four income classes with the intention of illustrating differences and similarities between reasonably sized classes.

[16]The World Bank Atlas method uses a different method to calculate income classes (income classification). The World Bank classification as of July 1st, 2010 is based on 2009 GNI per capita. The groups are: group low income, $995 or less; lower-middle income, $996 - $3,945; upper-middle income, $3,946 - $12,195; and high income, $12,196 or more

3 in the appendix reports, the income class for the 122 countries used in the analysis.

Table 2: Mean statistics by income class

Income class	Growth mean	Income mean US $ % (1993-2007)	Population mean, in thousands (1993*)
Low: $\leq$ 2,041	2.1	1,294	50,639
LowerMiddle: 2,041 - 6,336	2.4	4,203	66,219
UpperMiddle: 6,336 - 15,530	3.0	9,711	29,382
High: $\geq$ 15,530	2.4	25,020	27,481

Sources: IPD 2009, PWT 6.3
Income base year is 2005 (chain series method, constant prices)
*Population data and income data for the income classes are from 1993

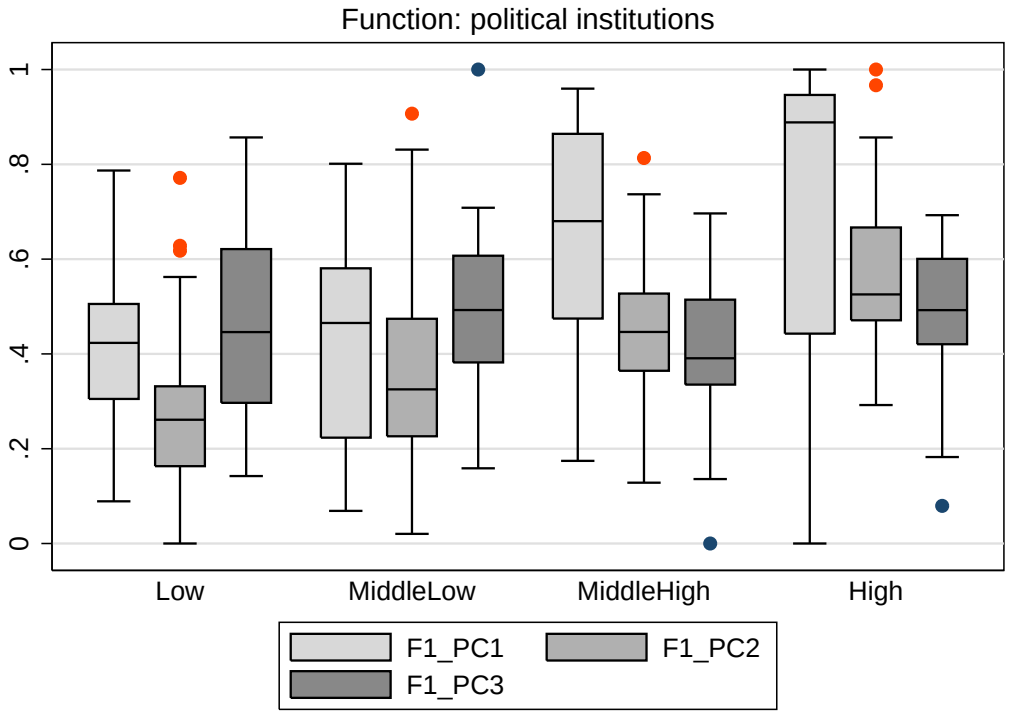
Figure 1 is the box and whisker diagrams for the first function and illustrates the cross-country variation for each PC (F1PC1, F1PC2, and F1PC3). This function is arbitrarily chosen as an example and the figures of the other functions are in the appendix, section 6.5. Figure 1 shows that there is variation in the indicators between income classes, and within income classes. The scales of the PCs are normalized on a scale from 0 to 1, where 1 is associated with the high pole.[17]

The figures show that the values for the first PCs on average increase across income classes. An exception is F2PC1, where countries in both low and middle low income classes have a low control of domestic violence. There are high income countries that have some institutional characteristics that are similar to those of low income countries. We find relatively little variation between the median and the (upper bound) largest values.

(World Bank, 2010). For our research purpose, GDP is a more interesting measurement because we are interested comparing countries domestic economic productivity (and not country nationals economic productivity).

[17]The first PCs by definition contain most of the variation in the data.

Figure 1: Country classification by income: function 1



The second PC 'Political legitimacy' (F1PC2), has a similar pattern across income classes as the pattern of the first PCs; the values increase along with the income classes.

The interpretation of the second and third PCs is more delicate and interpreting the direction of the item accurately is important. For example, our results show that some low income countries score high on 'flexicurity' in the labour market (F4PC2), a factor expressing the degree of flexibility in the public and in the private labour market, labour mobility, and profitability of enterprise. Japan and Qatar are positioned on the lower bound of this PC ('practice of employee security in profit making public sector'), whereas the USA, Romania and Sub Saharan countries are positioned on the upper bound.

Following the income distribution according to F3PC2, in low income countries state's have low control over organizations. In addition, nationalistic feelings are relatively low (F9PC3) in low income countries. F9PC2 is shaped by oil rich countries that score high on nationalistic feelings and high on segregation. F1PC3, is shaped by countries with a high level of decen-

tralized authority; there is a relatively high level of variation within the low income class.

We do not find a pattern for all second and third PCs. The third PCs have relatively long tails. As illustrated by the diagrams, each function has a few outliers. F2PC3 has a lot of outliers on the lower bound of the PC in the high income class. These are rich countries that have major international security tensions.

Institutional Functions and Variation between Growth Classes

Similarly as presented in the previous section, we construct four growth classes.[18] The growth classes are constructed using data on real GDP per capita (chain series, 2005 constant prices) from the PWT 6.3. We choose to take a longer growth period than is usually taken, 1993-2007, to avoid selecting years of crisis and/or reconstruction for certain country groups and also to smooth short run business cycles.[19] The growth data is constructed using the annualized growth calculation over time [t, t+p]:

$$g_{i,t+p} = \frac{1}{p}(y_{i,t+p} - y_{i,t})$$

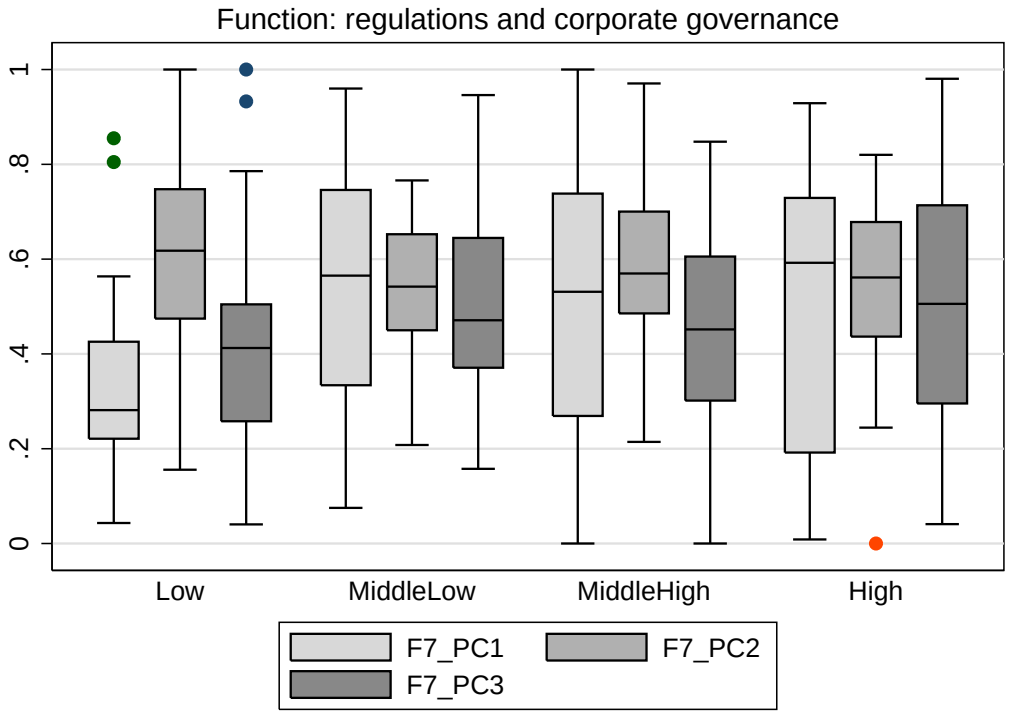
Where $y_{i,t}$ denotes the natural logarithm of the real GDP per capita, measured in constant prices, for country i at time t. The growth classes are constructed using the data's 25th, 50th, and 75th percentiles; low growth, lower-middle growth, upper-middle growth, and high growth.[20] Table 3 in the appendix lists the growth class for each country. The countries with the lowest growth rate in our data are Zimbabwe, democratic republic of Congo, Gabon, Madagascar, and Cote d'Ivoire. Countries with the highest growth rates are: China, Estonia, Latvia, Angola, and Ireland.

[18] We construct four growth classes to allow comparison between the growth classes, and also to allow comparison with the previously constructed income classes. For example, 'high income' countries are classified under low, lower-middle, upper-middle, and high growth class.

[19] Data for Bahrain (BHR) is missing in the year 2007; we use data from 2006 for this observation.

[20] Following the growth data quartiles, low growth is less than 1.48% growth, lower-middle growth is between 1.48% and 2.47%, upper-middle between 2.47% and 3.61% growth, and high growth is higher than 3.61% growth.

Figure 2: Country classification by growth: function 7



The following section describes the figures with the growth classification for the institutional functions. Figure 2 is based on the PCs of the function 'regulations and corporate governance' and the remaining figures are illustrated in the appendix, in section 6.6.

As is illustrated by the box and whisker plots, most of the median values are relatively similar across growth classes. Furthermore, the box plots have a wide variation within the upper and lower interquartile ranges, and have long tails. Exceptions include box plots of the low-growth class. Several of the first PCs in this growth class are positioned on the lower bound of this scale. Institutional characteristics that describe these countries are the following: high corruption and ineffective legal system, market controls and administered rates, low prioritization of growth, low security of contracts, few and / or weak implementation of market regulations, and personalized systems of solidarity.

These observations are hinting that there is no simple relation between countries' institutions and growth. Countries may not be required to have a specific determined set of institutional characteristics in order to gener-

ate growth. However, the data also shows that the low growth countries do not have formalized institutional characteristics. Therefore, no or little formalization of institutional characteristics appears to be a possible recipe for negative growth.

4.2 Interpreting Institutions

The final results of the data aggregation are two indicators (PCs) that can be interpreted as two main axes of institutional development. In this section we propose tentative interpretations. The first axis represents the extent of a country's *institutional formalization of regulations* and the depersonalization of their implementation (this axis explains 28% of the variance of this PCA). This main axis is a construct of the first PCs of each function.[21]

The countries Zimbabwe, Chad, Iran, Congo, and Togo are some of the countries that form one extreme of the axis; these countries oppose the other extreme of the axis shaped by Canada, Germany, Denmark, Belgium and the Netherlands. The first group of countries has societies that are based on strong interpersonal relationships whereas in the second group of countries society is shaped by impersonal relationships.

This axis may be related to the theoretical open access framework proposed by North et al. (2009); we identify countries that can be classified as 'Open Access Order' (OAO) as countries with formalized institutions, and we identify countries that can be classified as 'Limited Access Order' (LAO) as countries with personalized institutions. (North et al., 2009).[22] Moreover, This axis may also be related to the World Bank concepts of 'good governance', and 'rule of law' (Kaufmann, Kraay, and Mastruzzi, 2009).

The second axis represents the degree of *control and intervention* by the state (this axis explains 16% of the variance of this PCA). Mostly, this axis

[21]The first main axis is characterized by the following characteristics: democracy and civil liberties, security and control over legal armed forces, corruption and functioning of legal system, free functioning of markets, strategic planning and vision for growth, contracts, transactions and property rights, market regulations, trade and financial market openness to foreign investors, and social security regulations.

[22]North, Wallis, and Weingast (2009) identified three doorstep conditions that are necessary (but not sufficient) for societies with privileged elites to make a transition to a system that relies on competition and has open access to organizations: (i) rule of law for elites, (ii) perpetually lived organization in the public and private spheres, and (iii) consolidation of military power under control of a political system. "The three doorstep conditions illuminate the circumstances under which elites in natural states have incentives to create institutions that formalize their relationships, creating impersonal relationships between elites" (North et al., 2009, p. 188). These circumstances include, as identified by the authors, the establishment of a legal system, the foundation of contracts, and a reduction in the risk of violent uprisings caused by military.

is shaped by F1PC2, describing state's degree of political legitimacy and union activity, and by F3PC2, describing the degree of intervention in the private sector.[23] state's degree of legitimacy determines state's control, such that undisputed legitimacy guarantees the state power. The axis summarizes that institutions differ strongly with respect to the degree of state influence on the private sector and on households (e.g. access to health care, education, infrastructure, media).

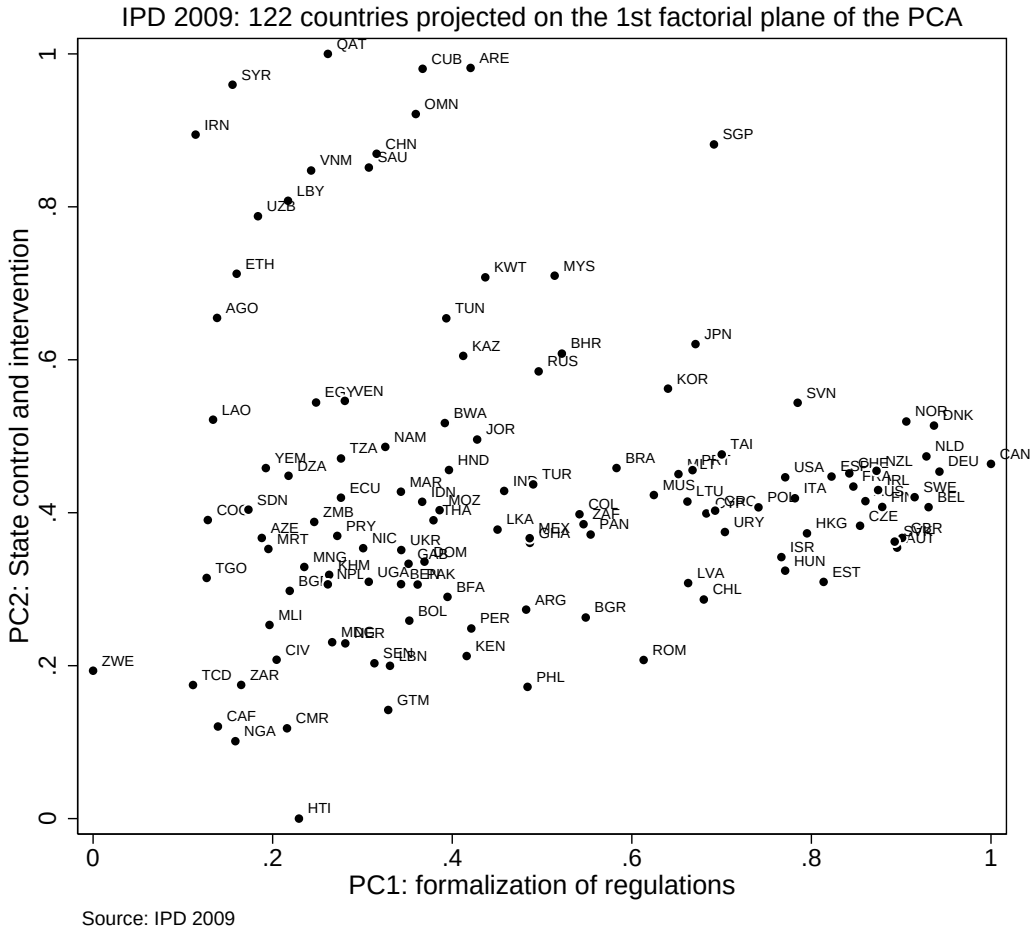
This second axis may be related to countries political-governmental system. The axis is mostly shaped by the items describing authoritarian states as opposed to economies with a great degree of freedom and autonomy; and countries with high political legitimacy opposed by an organized civil society. Countries with a strong state presence are: Cuba, Qatar, Syria, Iran, and United Arab Emirates. Non-authoritarian, non-interventionist or laissez-faire economies are Haiti, Cameroon, Nigeria, Central African Republic, and Guatemala. This is either because the state is weak or because of a free market arrangement. Western European countries, the USA, Canada, and Australia are at neither extreme of this axis. Singapore, a country with a strong state that prioritizes collective welfare, is positioned in the north-eastern corner of the figure.

Figure 3 shows the dispersion of the countries' institutional profile on the two main institutional axes.[24] The countries are dispersed in a funnel shape. The funnel shape suggests a partition of the countries in three clusters: (i) a cluster of countries with formalized institutions, (ii) a cluster of countries with fragmented and personalized institutions, and (iii) a cluster of countries with authoritarian and personalized social institutions.

[23] Other indicators that load moderately on the second axis are second PCs and some third PCs.

[24] The scales of the PCs are normalized. PC2 is inversed in order to facilitate the comparison with the figures produced by Meisel and Ould Aoudia (2008).

Figure 3: 1st factorial plane of PCA



Source: IPD 2009

The first cluster located on the right hand side of the axis are countries organized according to democracy and free market principles; security of land ownership, market competition, transparency and information of market, security of transactions and contracts, good governance, control of corruption administration and a strong legal system. States embrace environmental technology and the adaptation and innovation of organizations. These are characteristics of developed countries, where the middle classes are represented by the state.

The second cluster of countries consists of fragmented and personalized countries is positioned on the south-west corner and the third cluster consists of authoritarian and personalized countries is positioned on the north-west of figure 3. Both are clusters of countries that are based on traditional prop-

erty rights and state ownership, and the society is dependent on traditional solidarity. Traditional customs are reinforced through social contracts, giving less importance to the protection of formal and legal contracts. States are submitted to pressure from (external) donors. The scale of micro-credit provisions and strict control over sovereign funds guidelines may also be influenced by donors. The countries in positioned on the south-west of the axes have with weak or failing states that have limited capacities to steer and strategically implement policy. This is a non-interventionist economy. The authoritarian cluster has much stronger capacity to steer public policy.

Figure 3 illustrates that it is difficult to compare institutions because of their multifaceted diversity. Based on the interpretations of the PCs, only the countries with formalized institutions have relative homogeneous institutional characteristics. The dispersion amongst developing countries is extremely wide. The descriptive analysis concludes that institutions have to be considered in a more complex space than the 'good governance' and 'bad governance' scale. In accordance with North et al. (2009); Meisel and Ould Aoudia (2008); Khan (2004), we find that it is rather difficult to determine what the optimal path of institutional development is. Is the institutional development path a straight trajectory from depersonalized regulations to formalized regulations? What is the role of the state in steering development?

4.2.1 Convergence, Endogeneity, or Bias?

Countries with formalized institutional characteristics have relatively low variation in state control and intervention, and countries with personalized institutional characteristics have relatively high variation in state control and intervention. Figure 3 illustrates that if a country with personalized institutional characteristics were to make a transition to a country with formalized institutional characteristics, it could have, as starting point, authoritarian and personalized institutions, fragmented and personalized institutions, or it could be situated anywhere within this range. In this section we propose three explanations for the funnel shape; convergence, endogeneity, and bias.

Firstly, the funnel effect can be due to convergence of countries de-facto and de-jure institutional characteristics. Institutional convergence can be explained as a gradual process that occurs when a country's institutions change and start to resemble the institutions of another country, or group of countries. The de-facto convergence of institutional characteristics is a convergence in the functioning of institutions. The de-jure convergence of institutional characteristics is a convergence in institutions form, and can also be referred to as institutional isomorphism.[25]

[25]The term institutional isomorphism was used by DiMaggio and Powell (1983) to ex-

Institutional convergence may be caused by one or by several factors, such as, cultural similarity, common colonial influences, lower transaction costs, economies of scale, elites preferences during reforms, imitation of legal standards, pressure from media and academics. Institutional convergence may also be positively influenced by the increasing role of international organizations in standardizing regulations. Convergence could be a result of international intervention or pressures during crisis or war. Moreover, international organizations' promotion and use of good governance and democracy as a conditionality, may influence developing countries to enhance performance in accordance with international measurement criteria.

Similar to the equilibrium theory described in Prezeworski (2005), the convergence can be due to the establishment of an equilibrium in political representation, determining the degree of control and intervention of the state. Prezeworski (2005) argues that democracy is positively related to income. In high income countries, democracy is the preferred outcome and is the equilibrium outcome. In poor countries, the survival of a democratic regime is dependent on income equality and on the distribution of political representations' military force (Prezeworski, 2005).

Secondly, the funnel effect can be caused by measurement endogeneity. Countries' institutional developmental path influences the object of measurement. The presumed 'good governance' countries rank high on the indicators, democracy, corruption, freedom of press, whereas aid receiving countries rank low on these chosen measurements.[26] Theories about institutional development may be influenced by the institutional characteristics of generally high performing countries, and they essentially determine what we measure.[27]

Thirdly, these results may suffer from bias in the survey measurement criteria, due to the survey respondents bias, and due to bias in our interpretations. The construction and interpretation of institutional indicators is a delicate issue, where preconceptions influence interpretation. The understanding of a country's institutional development is shaped by institutional and non-institutional performance indicators, and by mental models. Mental models are implicit assumptions, preconceptions, generalizations such as

plain similarity in organizations.

[26]Some institutional indicators (e.g., the Doing Business indicators and Enterprise surveys) systematically rank rich countries on top of one-dimensional institutional development scales and rank poor countries at the bottom. Hereby, the top of the scale is interpreted as 'good' institutions or 'good' governance and the bottom of the scale is 'bad institutions' or 'bad' governance. Moreover, based on the preconception that good governance leads to growth, the famous institutional indicators, the World Bank's World Development Indicators, are used to promote good governance. In practice, the indicators determine developmental policy and countries' access to investment.

[27]Following the words of Einstein, 'it is the theory that decides what we can observe'.

'corruption is bad' or 'democracy increases growth' that may or may not be true.

Organizations and institutions carry mental models that influence methods and operations. Ideas about the functioning of countries institutions and their bearing on economic performance are based on the countries economists are most familiar with. For example,"the consensus argues that to generate growth, states have to protect stable property rights, defined by strong contract enforcement, low expropriation risk, and low corruption; they have to ensure undistorted markets defined by low rents; and they have to achieve democratic accountability and civil society participation to keep the state in check" (Khan, 2004, p. 2). Preconceptions may lead researchers to explain 'unfamiliar' institutions on the basis of more 'familiar' institutions, or to compare the institutions of high growth developing countries with todays developed countries — such as Germany and the USA — during their growth period in the 19th century.

4.3 The relationship between Countries' Institutions and Economic Performance

In this section we present the scatter plots illustrating the relationship between institutions and GDP and growth. We use the same data as presented in previous sections, the IPD data on countries' institutions and the economic performance data from PTW 6.3.

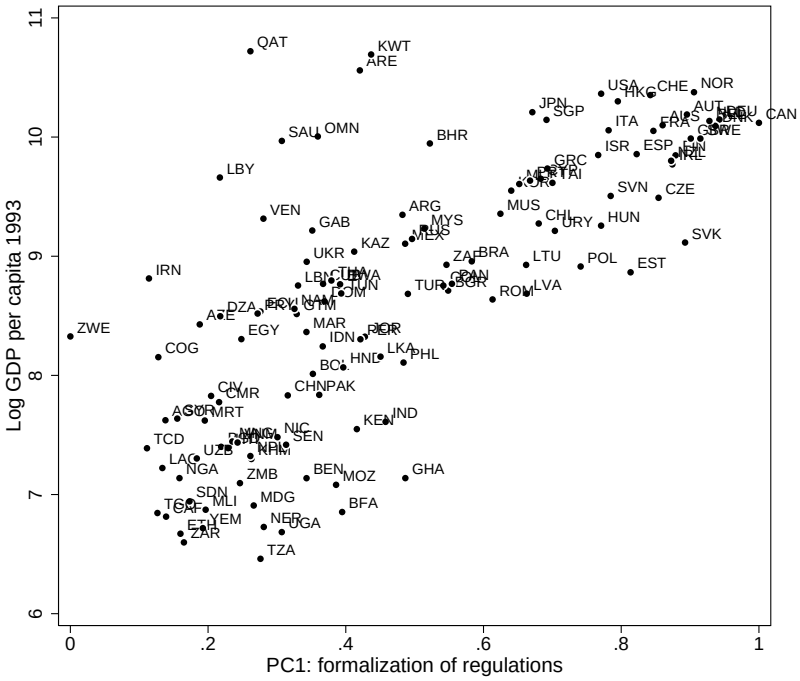
The PC1 - countries' income level relationship and PC2 - countries' income level relationship are illustrated in figure 4. The figure shows that there is a positive relation between institutions and income level. These results do not shed light on the causality of the relationship. However, based on the analysis of the distinguishing IPD items, we find arguments supporting the existence of a two-way relationship. We find that countries with governments and ruling classes that have a strong vision for development, high growth and innovation have high income levels. This may suggest that elite groups with such vision create an environment for sustaining higher levels of income. We also find evidence for the importance of items such as security of contracts, strong legal system, the formalization of regulations. The aforementioned institutional characteristics are costly to implement, suggesting that high income countries are better positioned to pursue the development of formal institutional regulations. Moreover, having a formal regulatory system can support countries to maintain higher levels of income.

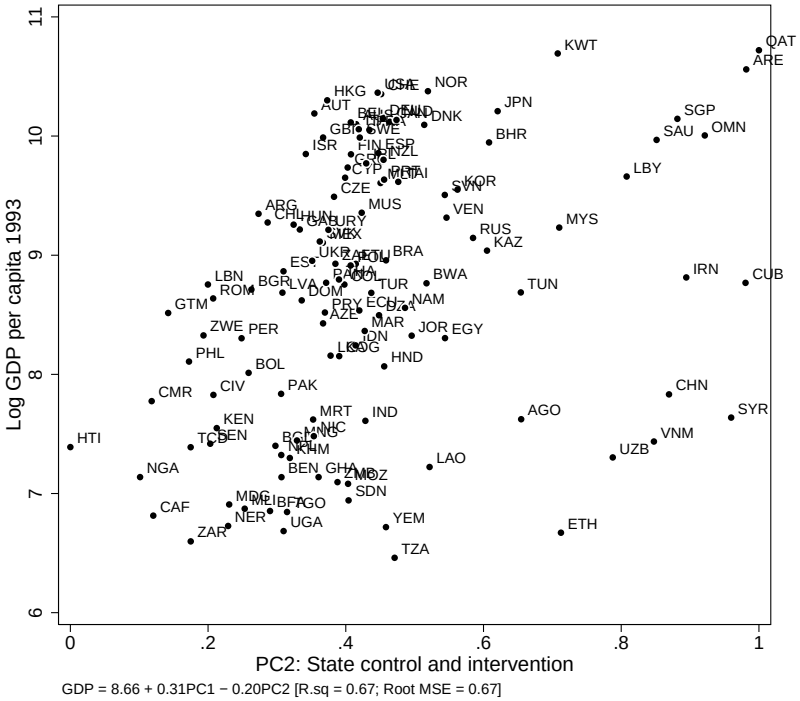
Closer analysis of the figures reveals that the difference in variance can be attributed to the disparity due to rentier and centrally planned countries

as is explained below. The positive relationship between the formalization of regulations and income level is illustrated in the first plot of figure 4. One particularity is that rentier —oil rich— countries appear to have an income wedge increasing their relative income.

The second plot depicts the relationship between PC2 (the degree of control and intervention by the state) and income level. The figure shows that countries with an important role for the state and high level of intervention have high income levels. The centrally planned economies and communist regimes influence the strength of the relation. These countries have a relative lower income level.

Figure 4: Institutions and income level





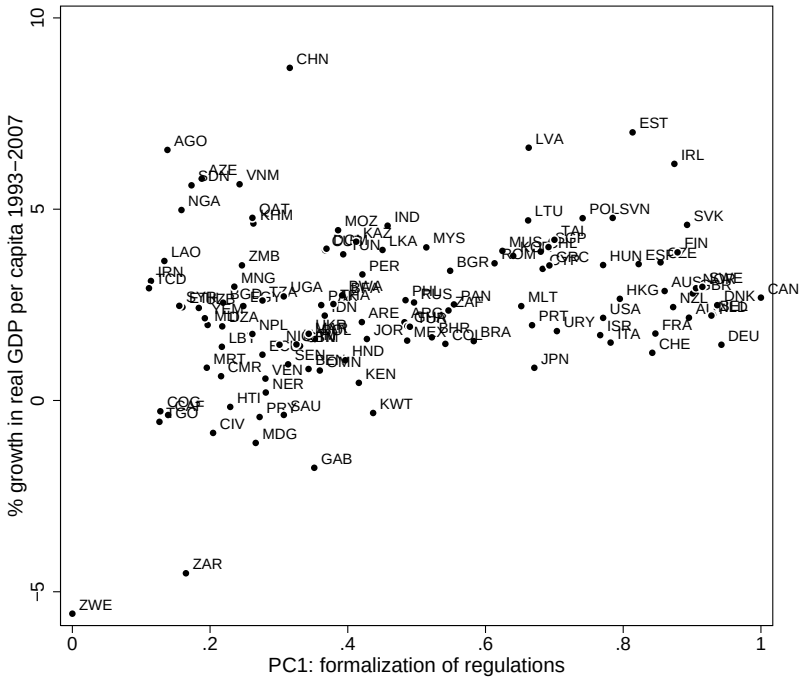
The plots in figure 5 depict the institutions-growth relationship. We highlight that whilst countries vary in terms of institutional characteristics and real GDP per capita growth for the period 1993-2007, there is no clear relationship between the two. At best, the relationship is very weak. This conclusion could imply that countries' growth potential is rather equal.

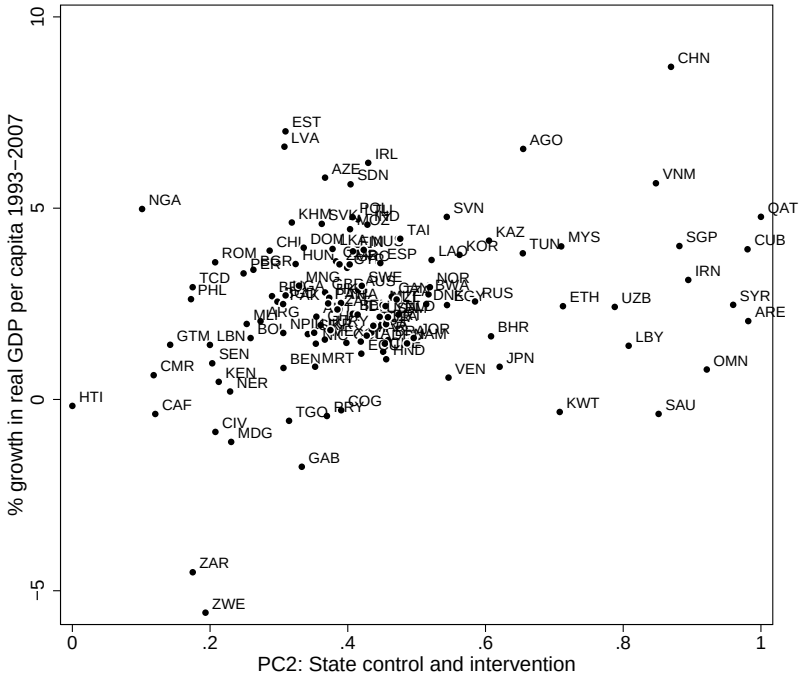
Several countries with fragmented and personalized regimes have negative growth levels. Therefore, we may have some evidence for a negative relationship between growth and countries with weak and failing states lacking regulations.

In this analysis we do not control for the influence of human capital, culture, and other factors that influence institutional development. The regression analyses included in our descriptive statistics are not conclusive but are solely used to enhance basic understanding.

The results and interpretations of our analyses are sensitive to the inclusion and exclusion of countries and survey questions. For example, the exclusion of high income countries from the analyses would yield a different 1st factorial plane with no or little funnel shape projection of countries. Studies based on a smaller selection of elementary variables would yield different PCs.

Figure 5: Institutions and growth





4.4 The Relationship between Countries' Institutions and Growth (In)Stability

In the preceding subsection we found that there is no simple relationship between countries' institutions and growth rates. In this section we further examine growth; we identify the relation between countries's institutions and the annual volatility of growth. Growth volatility is an important indicator of economic performance. For example, risk-adverse investors may be discouraged to invest in countries with a history of high volatility of growth rates because they may predict further instability. Rodrik (2000) finds that the variation in growth is higher in countries with an autocratic regime type than in countries with a democracy, and that therefore, "living under an authoritarian regime is a riskier gamble than living under a democracy" (2000, p. 18). We compare growth volatility with the two main axes of institutional development.

For this exercise, we use the growth rate of real GDP chain per capita as measured by PWT 6.3 (2005 constant prices) for the year 1994 to 2007. We calculate the standard deviation of the growth rates for each country.[28] The results are presented in the figures 6, 7, and 8.[29]

First, we find that whilst the majority of countries have a relative low volatility of growth rates, several countries experience high growth volatility during our period of analysis. On average, countries with formalized institutions (PC1) have less volatility in growth rates than countries with a personalized institutions do. The average volatility is higher for countries with personalized institutions because some of these countries have high growth volatility. For this sample selection and period of analysis, there are no countries with formalized institutions that have a relatively high growth volatility. Moreover, following figure 6, it appears that the wide fluctuations of volatility in growth rates decrease along with countries' formalization of regulations. Providing a formalized regulatory framework is likely to contribute to the stability of growth rates. Countries with personalized institutions may experience both rapid growth accelerations and episodes of negative growth, but sustaining positive growth is challenging.

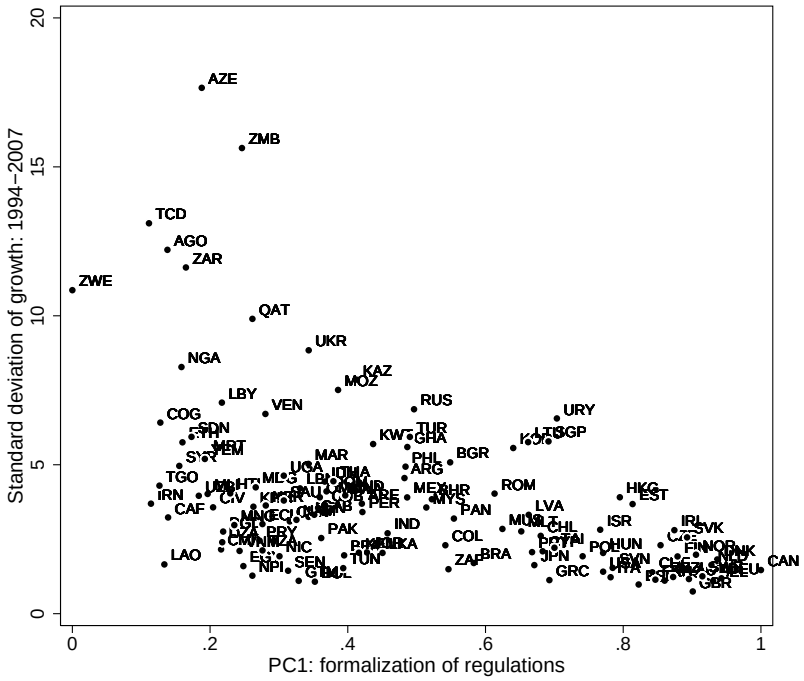
Secondly, we find no clear relationship between growth volatility and the degree of 'control and intervention by the state'. This result is interesting for this may imply that, implementing 'more' or 'less' control, policy

[28] In this exercise, data for Bahrain (BHR) is missing in the year 2007; we use data from 2006 for this observation.

[29] Calculations with the mean absolute deviation growth rates yield a more robust measure of the growth variability. In this case, the results calculated using the standard deviation of the growth rates are strong; additional robustness is not necessary.

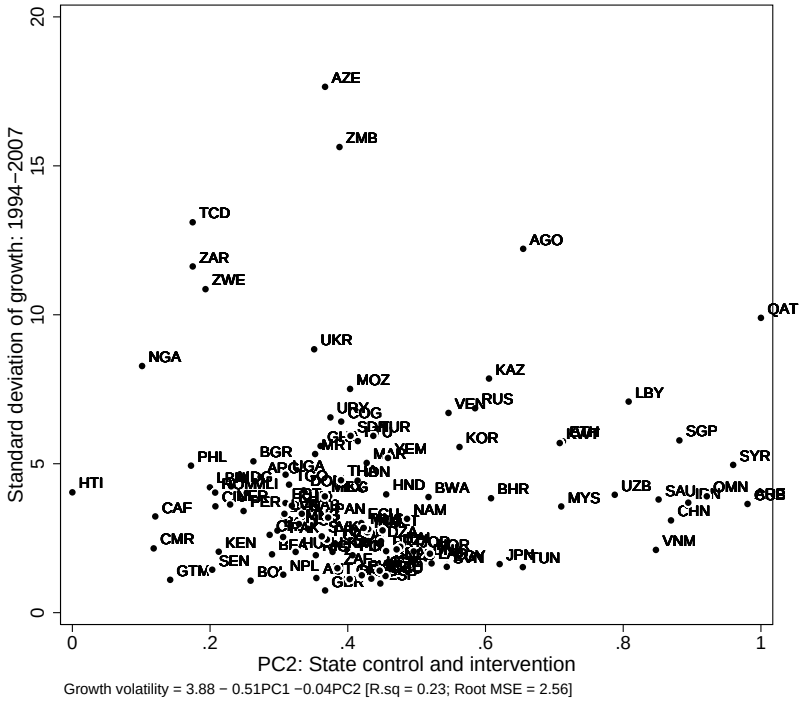
and regulations — laissez-faire versus interventionism — should be (only) a secondary priority for the state. Figures 7 and 8 allow to compare the performance of different income and growth classes. The figures illustrate that there are countries with high volatility and high growth and countries with low volatility and high growth. We find no clear pattern between countries with different levels or income and growth volatility.

Figure 6: Institutions and growth volatility



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

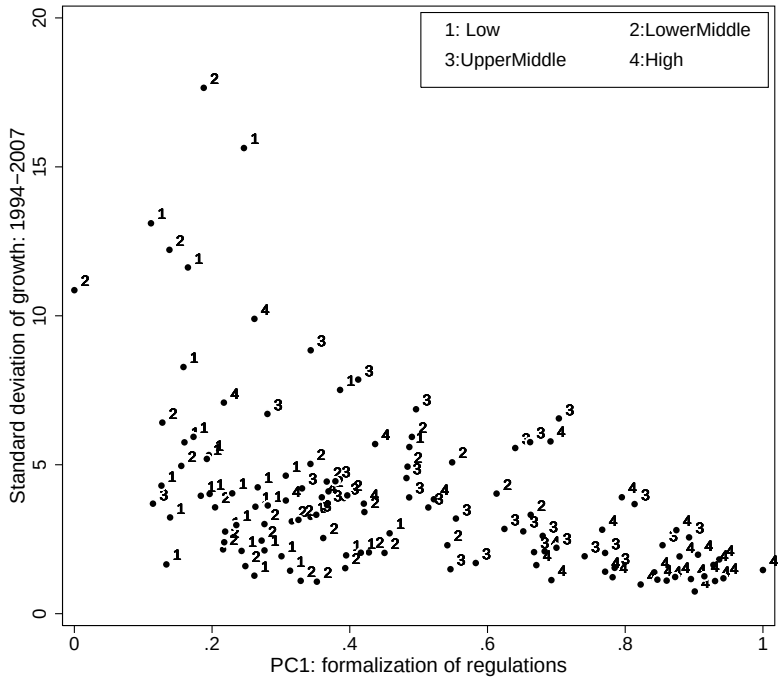
Source: IPD 2009 and PWT 6.3



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

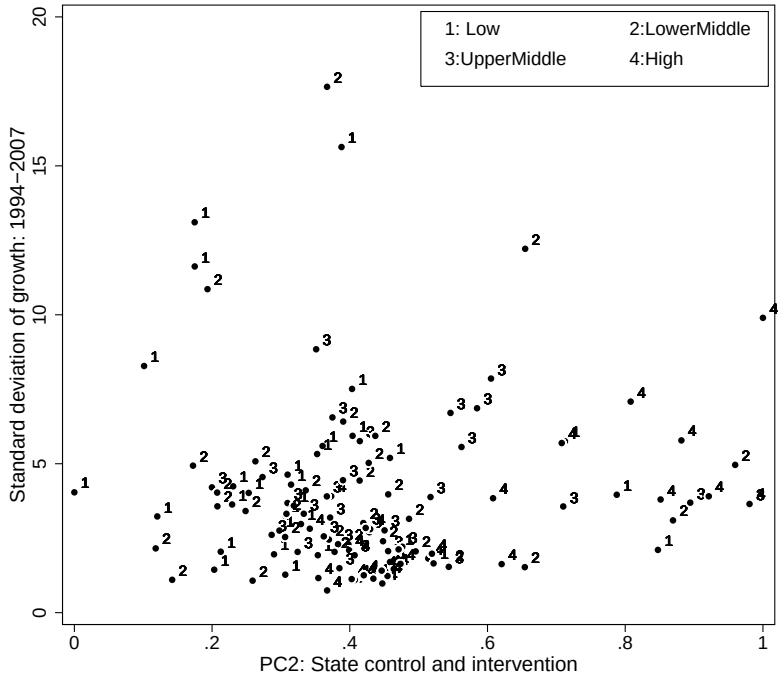
Source: IPD 2009 and PWT 6.3

Figure 7: Institutions and growth volatility, by income class



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

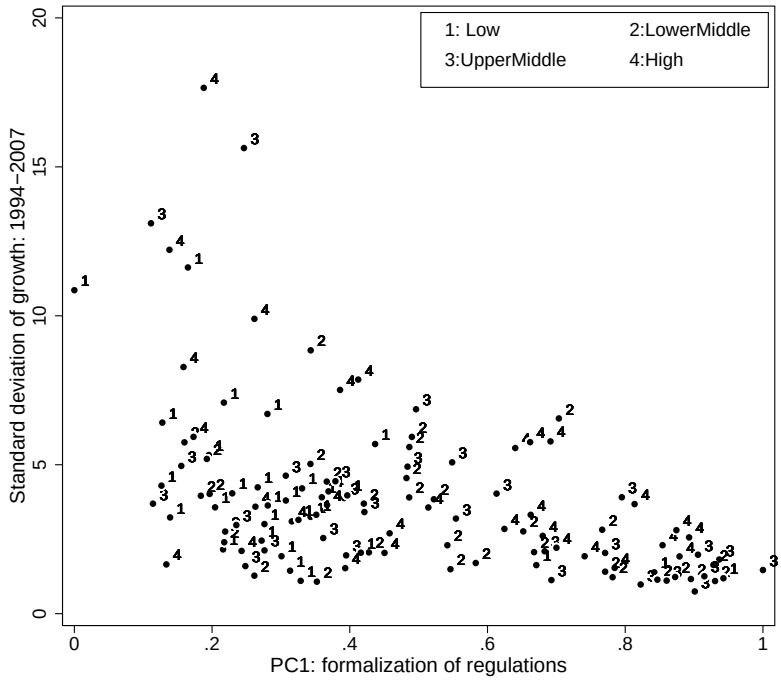
Source: IPD 2009 and PWT 6.3



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

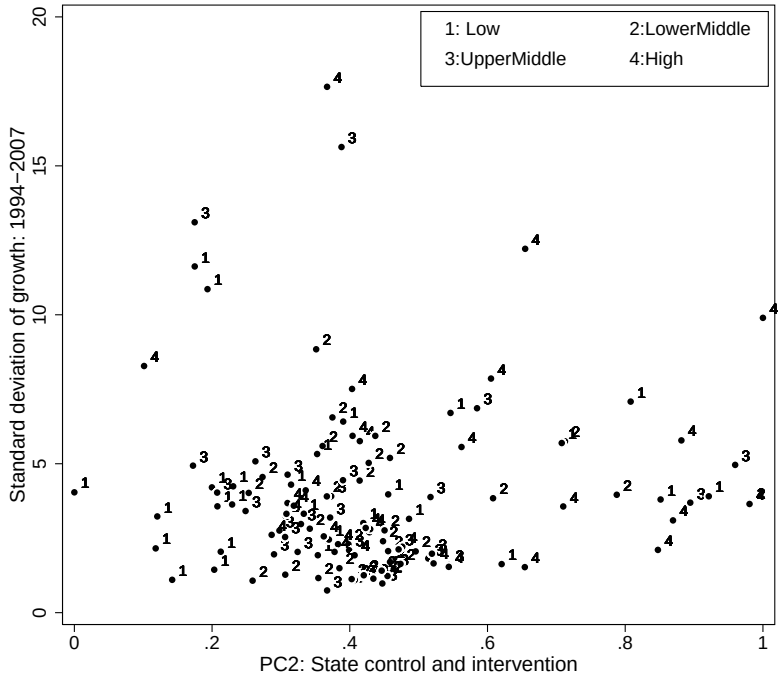
Source: IPD 2009 and PWT 6.3

Figure 8: Institutions and growth volatility, by growth class



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

Source: IPD 2009 and PWT 6.3



Growth volatility = 3.88 − 0.51PC1 −0.04PC2 [R.sq = 0.23; Root MSE = 2.56]

Source: IPD 2009 and PWT 6.3

5 Conclusion

In this document we presented the results of an exploratory study about countries' institutions and about their relationship with economic performance, using the 2009 (third) wave of the Institutional Profiles Database (IPD) compiled by the French Development Agency (Agence Française de Développement). The methods of aggregation and analysis are a further development of the principal component methodology used by Meisel and Ould Aoudia (2008) to study the preceding 2006 wave. The 2009 wave provides material on the institutional framework and functioning of 123 countries (against 85 in the 2006 wave). 122 countries have been used in this study. To deal with the large number of questionnaire items covering a wide spectrum of institutional aspects and functions we used a two-level hierarchical principal components analysis. Composite indicators were constructed in order to facilitate the cross-country comparison of institutional profiles.

The composite (or 'aggregate') indicators reveal substantial variation between countries. Two principal indicators dominate the inter-country variation, analogous to those found by Meisel and Ould Aoudia (2008). The first is clearly related to the extent of institutional formalization of regulations and depersonalization of their implementation; the second is interpreted as the degree of control and intervention by the state. Further study remains necessary for a good understanding of the precise role that these institutional dimensions may play in determining countries' development. The main conclusion at this stage is that, in line with Meisel and Ould Aoudia (2008), we find much less dispersion in the degree of control and intervention by the state amongst countries with formalized regulations than amongst countries with personalized institutions. We suggest that, while this pattern might be interpreted as institutional convergence, it could be due to endogeneity or other biases in the data.

An exploratory analysis of the institutional indicators together with income and growth data is conducted. Meisel and Ould Aoudia (2008) documented a strong positive relationship between countries' income level and the formalization of regulations. This relationship is confirmed here, as well as a much more ambiguous relationship between income and the degree of state control and intervention. We find, however, very weak evidence for a relationship between economic growth and institutions. Countries with little institutional formalization seem to experience growth rates quite comparable to those of countries with highly formalized institutions. Based on this observation it may be concluded (again following Meisel and Ould Aoudia) that lower-middle-income countries will not achieve higher growth by mimicking the institutions of high-income countries. On the other hand, it seems that

stronger regulations and state control in low income countries might well improve the prospect for growth.

Finally, we find evidence of a significant relationship between growth volatility and the degree of countries' formalization of regulations. We find no such evidence linking growth volatility to the degree of state control and intervention.

In this exploratory study, we draw no conclusions about the causal nature of the apparent relationships. Nevertheless, our results seem to lend support to the view that institutional reform programmes need to be very much tailored to the specificities of the target countries. As is widely accepted now, uniform prescriptions to regulate formally or to deregulate are unlikely to be good recipes for growth. We hope further research will help to understand specific influences of institutional characteristics, for example the elite's orientation, on the economic performance of countries.

References

D. de Crombrugghe, K. Farla, N. Meisel, C. de Neubourg, J. Ould Aoudia, and A. Szirmai. Institutional Profiles Database III. Technical report, Agence Française de Développement (AFD), Maastricht Univeristy (UM), and CEPII, 2010. Presentation of the Institutional Profiles Database 2009 (IPD 2009).

P. J. DiMaggio and W. W. Powell. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2):147–160, 1983.

A. Dixit. Governance Institutions and Economic Activity. *American Economic Review*, 99:5–24, 2009.

W. Easterly and R. Levine. It's not Factor Accumulation: Stylized Facts and Growth Models. *The World Bank Economic Review*, 15(2):1–57, 2001.

K. P. Huynh and D. T. Jacho-Chavez. Growth and Governance: A non parametric analysis. *Journal of Comparative Economics*, 37:121–143, 2009.

C. J Jones and P. M. Romer. The New Kaldor Facts: Ideas, institutions, population, and human capital. Working Paper, 15094, Cambridge, 2009.

D Kaufmann, A. Kraay, and M. Mastruzzi. Governance matters viii: Aggregate and individual governance indicators 1996-2008. Technical report, World Bank Institute, Washington, DC, 2009.

M. Khan. State Failure in Developing Countries and Institutional Reform Strategies. Annual World Bank Conference on Development EconomicsEurope 2003, 2004.

K. Lee and B-Y. Kim. Both Institutions and Policies Matter but Differently for Different Income Groups of Countries: Determinants of Long-run economic growth revisited. *World Development*, 37(3):533–549, 2008.

N. Meisel and J. Ould Aoudia. Is "Good Governance" a Good Development Strategy? Working Paper, Agence Française de Développement, 2008.

D. North. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, New York, 1990.

D. C. North, J. J. Wallis, and B. R. Weingast. *Violence and Social Orders a conceptual framework for interpreting recorded human history*. Cambridge University Press, 2009.

OECD. Handbook on Constructing Composite Indicators: Methodology and User Guide. Statistic Working Papers 03, OECD, Paris, 2005.

A. Prezeworski. Democracy as an Equilibrium. *Public Choice*, 123:253–273, 2005.

D. Rodrik. Institutions for High-Quality Growth: What They Are and How to Acquire Them. *Studies in Comparative International Development*, 35 (3):3–31, 2000.

D. Rodrik, A. Subramanian, and F. Trebbi. Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development. *Journal of Economic Growth*, 9:131–165, 2004.

World Bank. How we Classify Countries, 2010. URL http://data.worldbank.org/about/country-classifications.

6 Appendix

6.1 Countries in the Institutional Profile Database 2009

Table 3: Countries in IPD, listed according to growth class, income class, and population

Code	Country	Income class	Growth class	Population	% of world population
AGO	Angola	LowerMiddle	High	8966.26	.17
ARE	United Arab Emirates	High	LowerMiddle	2184.2	.04
ARG	Argentina	UpperMiddle	LowerMiddle	34407.2	.65
AUS	Australia	High	UpperMiddle	17607.8	.33
AUT	Austria	High	LowerMiddle	7988.6	.15
AZE	Azerbaijan	LowerMiddle	High	7482.15	.14
BEL	Belgium	High	LowerMiddle	10085.4	.19
BEN	Benin	Low	Low	5250.36	.1
BFA	Burkina Faso	Low	UpperMiddle	9237.7	.17
BGD	Bangladesh	Low	UpperMiddle	119096	2.25
BGR	Bulgaria	LowerMiddle	UpperMiddle	8441.87	.16
BHR	Bahrain	High	LowerMiddle	543.998	.01
BOL	Bolivia	LowerMiddle	LowerMiddle	7054.34	.13
BRA	Brazil	UpperMiddle	LowerMiddle	158512	2.99
BWA	Botswana	UpperMiddle	UpperMiddle	1389.35	.03
CAF	Central African Republic	Low	Low	3367.95	.06
CAN	Canada	High	UpperMiddle	28953.3	.55
CHE	Switzerland	High	Low	7058.21	.13
CHL	Chile	UpperMiddle	High	13789.4	.26
CHN	China	LowerMiddle	High	1.2e+06	22.47
CIV	Cote d'Ivoire	LowerMiddle	Low	13860.6	.26
CMR	Cameroon	LowerMiddle	Low	12920.5	.24
COG	Congo, Republic of	LowerMiddle	Low	2488.94	.05
COL	Colombia	LowerMiddle	LowerMiddle	35012	.66
CUB	Cuba	UpperMiddle	High	10756.7	.2
CYP	Cyprus	High	UpperMiddle	718.776	.01
CZE	Czech Republic	UpperMiddle	High	10326.4	.19
DEU	Germany	High	Low	81132.3	1.53
DNK	Denmark	High	UpperMiddle	5188.39	.1
DOM	Dominican Republic	LowerMiddle	High	7488.51	.14
DZA	Algeria	LowerMiddle	LowerMiddle	26916.4	.51
ECU	Ecuador	LowerMiddle	Low	10753.7	.2
EGY	Egypt	LowerMiddle	UpperMiddle	60671.5	1.14

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ESP	Spain	High	UpperMiddle	39627.6	.75
EST	Estonia	UpperMiddle	High	1491.43	.03
ETH	Ethiopia	Low	LowerMiddle	52803	1
FIN	Finland	High	High	5064.85	.1
FRA	France	High	LowerMiddle	59169.2	1.12
GAB	Gabon	UpperMiddle	Low	1013.16	.02
GBR	United Kingdom	High	UpperMiddle	58026.9	1.1
GHA	Ghana	Low	LowerMiddle	16814.1	.32
GRC	Greece	High	UpperMiddle	10383	.2
GTM	Guatemala	LowerMiddle	Low	9522.88	.18
HKG	Hong Kong	High	UpperMiddle	5934.51	.11
HND	Honduras	LowerMiddle	Low	5229.62	.1
HTI	Haiti	Low	Low	6662.26	.13
HUN	Hungary	UpperMiddle	UpperMiddle	10329	.19
IDN	Indonesia	LowerMiddle	LowerMiddle	191272	3.61
IND	India	Low	High	884943	16.7
IRL	Ireland	High	High	3578.35	.07
IRN	Iran	UpperMiddle	UpperMiddle	60150.9	1.14
ISR	Israel	High	LowerMiddle	4997.77	.09
ITA	Italy	High	LowerMiddle	57026.7	1.08
JOR	Jordan	LowerMiddle	LowerMiddle	3984.24	.08
JPN	Japan	High	Low	124668	2.35
KAZ	Kazakhstan	UpperMiddle	High	16451.6	.31
KEN	Kenya	Low	Low	25817.6	.49
KHM	Cambodia	Low	High	10606.9	.2
KOR	Korea, Republic of	UpperMiddle	High	44307	.84
KWT	Kuwait	High	Low	1483.77	.03
LAO	Laos	Low	High	4581.22	.09
LBN	Lebanon	UpperMiddle	Low	3254.86	.06
LBY	Libya	High	Low	4475.68	.08
LKA	Sri Lanka	LowerMiddle	High	17997.2	.34
LTU	Lithuania	UpperMiddle	High	3689	.07
LVA	Latvia	LowerMiddle	High	2565.71	.05
MAR	Morocco	LowerMiddle	LowerMiddle	26403.8	.5
MDG	Madagascar	Low	Low	12736.6	.24
MEX	Mexico	UpperMiddle	LowerMiddle	89749.1	1.69
MLI	Mali	Low	LowerMiddle	8593.64	.16
MLT	Malta	UpperMiddle	LowerMiddle	370.008	.01
MNG	Mongolia	Low	UpperMiddle	2359.69	.04
MOZ	Mozambique	Low	High	13691.4	.26
MRT	Mauritania	Low	Low	2119.24	.04
MUS	Mauritius	UpperMiddle	High	1098.64	.02
MYS	Malaysia	UpperMiddle	High	18753.9	.35
NAM	Namibia	LowerMiddle	Low	1595.14	.03
NER	Niger	Low	Low	8609.31	.16
NGA	Nigeria	Low	High	104200	1.97

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NIC	Nicaragua	Low	Low	4142.31	.08
NLD	Netherlands	High	LowerMiddle	15274.9	.29
NOR	Norway	High	UpperMiddle	4311.96	.08
NPL	Nepal	Low	LowerMiddle	20641.4	.39
NZL	New Zealand	High	LowerMiddle	3536.64	.07
OMN	Oman	High	Low	1988.75	.04
PAK	Pakistan	LowerMiddle	UpperMiddle	122524	2.31
PAN	Panama	UpperMiddle	UpperMiddle	2538.36	.05
PER	Peru	LowerMiddle	UpperMiddle	22992.7	.43
PHL	Philippines	LowerMiddle	UpperMiddle	69417	1.31
POL	Poland	UpperMiddle	High	38467.7	.73
PRT	Portugal	UpperMiddle	LowerMiddle	9967.83	.19
PRY	Paraguay	LowerMiddle	Low	4622.14	.09
QAT	Qatar	High	High	491.044	.01
ROM	Romania	LowerMiddle	UpperMiddle	22768.5	.43
RUS	Russia	UpperMiddle	UpperMiddle	148390	2.8
SAU	Saudi Arabia	High	Low	18057.8	.34
SDN	Sudan	Low	High	28581.7	.54
SEN	Senegal	Low	Low	8771.81	.17
SGP	Singapore	High	High	3328.15	.06
SVK	Slovak Republic	UpperMiddle	High	5323.58	.1
SVN	Slovenia	UpperMiddle	High	1999.93	.04
SWE	Sweden	High	UpperMiddle	8769.28	.17
SYR	Syria	LowerMiddle	UpperMiddle	13579	.26
TAI	Taiwan	UpperMiddle	High	20848.3	.39
TCD	Chad	Low	UpperMiddle	6379.1	.12
TGO	Togo	Low	Low	3726.01	.07
THA	Thailand	UpperMiddle	UpperMiddle	57400.7	1.08
TUN	Tunisia	LowerMiddle	High	8684.12	.16
TUR	Turkey	LowerMiddle	LowerMiddle	59800.5	1.13
TZA	Tanzania	Low	UpperMiddle	27696.6	.52
UGA	Uganda	Low	UpperMiddle	19424.4	.37
UKR	Ukraine	UpperMiddle	LowerMiddle	51884.2	.98
URY	Uruguay	UpperMiddle	LowerMiddle	3174.79	.06
USA	United States	High	LowerMiddle	260255	4.91
UZB	Uzbekistan	Low	LowerMiddle	22127.6	.42
VEN	Venezuela	UpperMiddle	Low	20691.4	.39
VNM	Vietnam	Low	High	71244	1.34
YEM	Yemen	Low	LowerMiddle	13885.8	.26
ZAF	South Africa	UpperMiddle	LowerMiddle	40940.6	.77
ZAR	Congo, Dem. Rep.	Low	Low	43026.9	.81
ZMB	Zambia	Low	UpperMiddle	8670.84	.16
ZWE	Zimbabwe	LowerMiddle	Low	10976.4	.21

Sources: IPD 2009, PWT 6.3
Population (in thousands) is from 1993

6.2 Extract from the questionnaire

Code and name: A300, transparency of public economic action

Scale: 0 = no information published. If there is information, from 1 = unreliable to 4 = totally reliable

Table 4: IPD Extract

Code	Survey question	Scale
A3000	Government budget	from 0 to 4
A3001	Extra-budgetary funds	4 = no extra-budgetary funds
A3002	Accounts of state-owned enterprises	from 0 to 4
A3003	Accounts of public banks	from 0 to 4
A3004	Basic economic and financial statistics (national accounts, price indices, foreign trade, currency and credit, etc)	from 0 to 4
A3005	Is IMF consultation under Article IV published?	no =0, partially =2, totally =4

6.3 Recoding

For the following elementary variables and observations, we aimed to 'neutralize' the data as much as possible. Two countries, Hong Kong and Singapore, have no rural areas. For these countries, the survey question about rural areas in countries without rural territory do not apply, the rural-area phenomena indicators are given the same score as the urban-area phenomena (for example, in B606, B609, B705, and D900). Similarly, some countries have no sub-national level of governance; for such countries, the score allocated to the national level is also allocated to the question addressing the sub-national level (A107 and A108). For some countries, it is indicated that there are no 'other armed bodies (paramilitary police, official militia, others, etc.)' (A2013). For these countries, the score given to this elementary variable is the simple mean of the answers given to the other three sub-questions under this elementary variable ('Political authority control over the legal armed forces: Over the army' (A2010); 'Over the police' (A2011); and 'Over the secret services' (A2012)).

For some countries, it is indicated that there are no public banks. In such cases, scores for question A3003: 'Transparency of public economic action - Accounts of public banks' are the same as for the question regarding state-owned enterprises: A3002: 'Transparency of public economic action - Accounts of state-owned enterprises'. Re-codifications are made for the questions referring to natural resources (B3030 and B3031) or the presence of minorities within the population (B6082). A country without natural

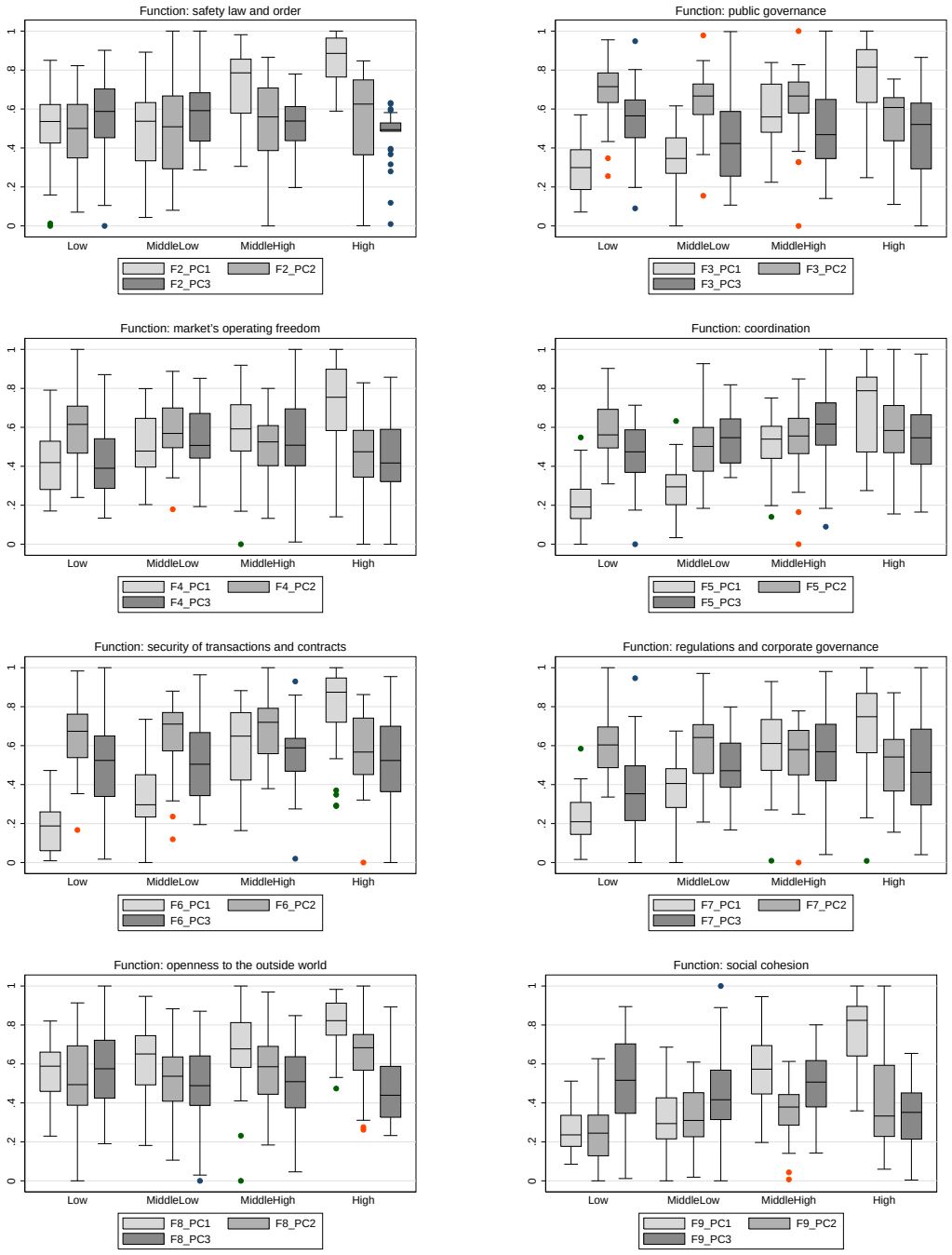
resources or without such groups is given the median score of all the non-zero answers for the other countries. We constructed the indicator A908f, 'Subsidy on commodities' from B4041 (direct commodity price subsidies) and B4042 (Oil: deviation between pump prices and world prices). The aggregated elementary variable A908f is arbitrarily constructed as follows: 1 x B4041 (reversed) + 1/3 x B4042 (reversed) and then put in the range 0-4.

6.4 Particular Cases in Aggregation

The survey results of some elementary variables are problematic to aggregate by their weighted average; they are better aggregated by multiplication, in order to better accommodate the nature of the questions. The indicator B701 'Competition in distribution (household consumption)' has three sub-questions consisting of: B7010 'Share of supermarkets in the retail trade (household consumption)'; B7011 'Share of distribution delivered by large national firms'; B7012 'Share of distribution delivered by large foreign firms'. The responses to these sub-questions are aggregated by multiplication. Results are rescaled to a range of 0 - 4. Multiplicative aggregation is also used for C900 'Micro-lending'. This indicator has 3 elementary variables: C9000 'Informal micro-lending'; C9001 'Institutional micro-lending (supported by NGOs, banks, etc.)'; C9002 'Quality of micro-lending guarantees (informal or institutional)'. Results are rescaled to the range 0 - 4.

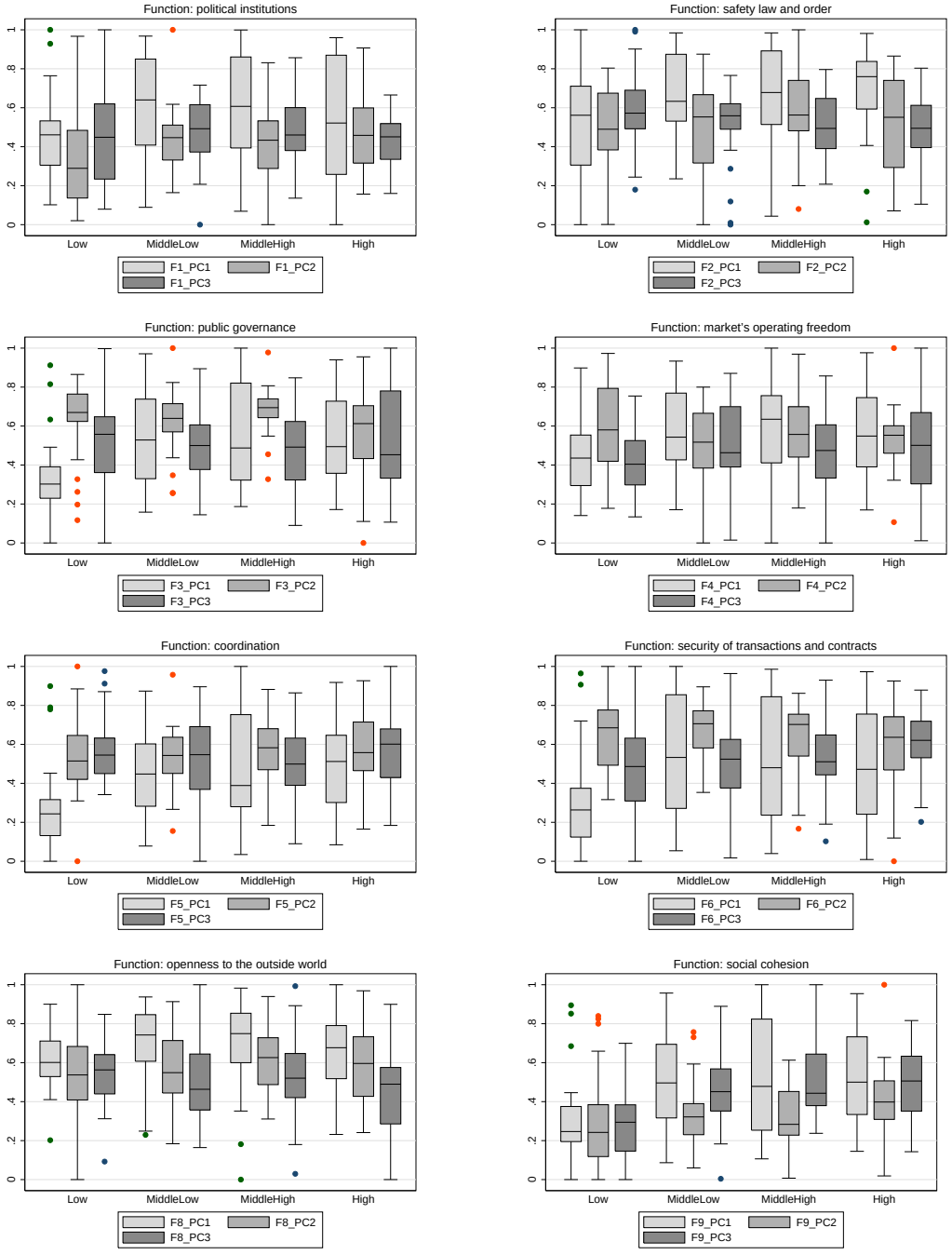
6.5 Income Classes

Figure 9: Country classification by income *(for function 'Political institutions' see figure 1 in main text)*



6.6 Growth Classes

Figure 10: Country classification by growth *(for function 'Regulations and corporate governance' see figure 2 in main text)*



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