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Exploring the Panel Components of the Institutional Profiles Database (IPD)
Luciana Cingolani and Denis de Crombrugghe

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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Exploring the Panel Components of the Institutional Profiles Database (IPD)

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Abstract

The Institutional Profiles Database (IPD) produced by the Agence Française de Développement (AFD) has been carried out in 2001, 2006 and 2009, and a new wave is planned for 2012. Although the structure of the surveys varies greatly between 2006 and 2009, the similarity of a substantial proportion of the questions allows for exploring and exploiting the panel components of the database. This paper presents some general patterns of short-term institutional change, aided by a conceptual classification of the institutional variables. It tests two hypotheses in a preliminary way: a) that institutions tend to score higher over time, and b) that institutions tend to converge across countries. Additionally, it explores associations between institutions and growth for the period 2001-2009.

1 Introduction

The topic of institutional change has attracted a great deal of attention within the neoinstitutional literature of the recent decades. Many facets of it have been studied, such as the pace of institutional change (Krasner 1984; Tushman and Romanelli 1985), its exogenous and endogenous determinants (e.g. Greif and Laitin 2004), and in particular how exactly processes of institutional change take place

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and evolve over time (DiMaggio and Powell 1983; March and Olsen 1989; North 1990, North 2006; North, Walllis and Weingast 2009).[1]

Entering fully into the complexities of this vast topic is beyond the scope of this article. Yet, the article aims to provide some empirical evidence regarding short-term institutional change that may be illustrative enough to test some basic propositions. This opportunity is given by the original compilation of a three-wave panel dataset from a subset of the Institutional Profiles Database (IPD) produced by the Agence Française de Développement (AFD).[2] The three waves correspond to the years 2001, 2006 and 2009, although only a part of the survey questions were kept similar enough to include them as panel variables, in a sample of 51 countries evenly distributed across world regions. The breadth of the IPD database allows to explore short-term institutional change along a set of numerous and varied institutions with a level of disaggregation that is not common to find in other sources.

In section 2 we provide a methodological explanation of how the panel IPD database was compiled and how the data contained was aggregated in order to construct interpretable measures of institutional dimensions. Section 3 presents some general descriptive statistics summerizing short-term institutional change, both for the full sample and across regions. Section 4 puts to test some basic premises about institutional change: whether institutions tend to improve over time and whether they tend to converge. Section 5 presents time-series analyses of the associations between institutions and growth. Section 6 concludes.

2 Data compilation

2.1 Compilation of three comparable waves

In order to spot the variables that were comparable in all three waves (2001, 2006, 2009), the 4-digit items of the original surveys were assessed[3]. Regarding this, a total of 159 items were considered either identical or sufficiently similar for a total of 51 countries[4], out of the 376 items included in IPD 2009, and the 281 items of

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[1] For an interesting review see Kingston and Caballero 2009.

[2] The IPD database can be downloaded from the websites of the AFD, Maastricht Graduate School of Governance and CEPII.

[3] Retaining the 4-digit items as opposed to the 3 or 2 digit items was found preferable in order to carry through a completely clean comparison across waves, and to better distinguish between the conceptual categories that were later used for analysis.

[4] See Annex 7.1 and 7.2 for details on the countries and questions retained.

IPD 2001 and 2006. Also, the items retained were rather balanced across the nine functions and the four sectors of the original survey. The number given to each comparable item listed in the Annex 7.2 is that corresponding to its equivalent of the 2009 wave (i. e., although the 159 are comparable across waves, for the most part their numbering changed from 2006 to 2009). As a result, we end up with a balanced panel with three time periods, and a total of 153 observations.

2.2 Conceptual Aggregation

Once the panel dataset was configured, a first aggregation mechanism needed to be decided upon in order to make the data manageable for the purpose of analyzing general patterns and trends of institutional change in all countries of the sample. There are, of course, several ways of aggregating IPD data, depending on the nature of the analyses[5]. In the case of the panel structure for the three waves, it was considered most useful to work with a conceptual aggregation of the items, aiming to match as best as possible existing theoretical (and often also empirical) classifications of institutional variables in the neoinstitutional scholarship.

In order to retain a manageable number of institutional variables out of the data, each of the 4 digit items were classified into ten institutional dimensions and seven policy areas. Some items serve to two dimensions (only rarely to three), as it can be argued they are good proxies for either.

The ten institutional dimensions are: 1) Democracy and Civil Liberties; 2) Security and Order; 3) Power dispersion institutions; 4) Social Cohesion and Social Dialogue; 5) Property Rights and Rule of Law; 6) Government Capacities; 7) Transparency and Accountability; 8) Economic Openness; 9) Social Openness; 10) State Intervention in the Economy. The seven policy areas are: 1) Social Policy; 2) Subsidies and Price Controls; 3) Intellectual Property Rights protection; 4) Defence of Competiton; 5) Financial and Banking Policy; 6) Labor Policy; 7) Education and Training Policy. A brief explanation of each dimension will follow in the next section.

There are several reasons for this aggregation. First, the categories are easily interpretable and rather parsimonious. Second, the concepts follow to a certain extent the conceptual guidelines behind the IPD survey structure. Third, the aggregation is not wave-dependent (i. e. the interpretation of the aggregation does not change in every wave, so it represents a stable comparison structure for the past as well as forward looking). Fourth, this aggregation offers a better opportunity to distinguish between fundamental institutions and policies. Finally,

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[5]Examples of aggregations can be seen in de Crombrugghe and Farla 2011.

it allows significant room for the interaction with other institutional databases, as well as academic debate within the established scholarship.

The distinction between institutions and policies is common in economic studies of institutions and growth. Its relevance lies, among other things, in the opportunity of distinguishing between feasible and less feasible interventions in the public arena. In general, what the literature recognizes as fundamental institutions tend to be slow-moving, wide-encompassing rules of the game, whereas policies appear as more malleable in the short-run (on this, see the differentiation made by Tommasi and Acuña (2000) in their "hierarchy of rules" classification).

3   Descriptive patterns of institutional change

In this section we present the data corresponding to the institutional measures constructed for our sample of 51 countries in 2001, 2006 and 2009. We first present summary statistics of all 10 institutions and 7 policy areas for the full sample. We then place the focus only on the institutions, explaining their conceptual grounding on theory and presenting a visual approximation to their short-term evolution across world regions.

3.1   Institutional change across the world

Table 1 presents the mean values and the standard deviations (in parentheses) of the 10 institutional dimensions extracted from the IPD panel database, in all three waves. The scaling of each measure goes from 0 (denoting a lower level of institutional maturity) to 4 (denoting the highest level)[6]. The dimension Intervention in the Economy in reality measures to which extent the economy is free of intervention, meaning that 4 involves low intervention levels.

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[6]This scale is the same for the individual 4-digit items. Most items range from 1 to 4, except those measuring whether a certain policy or condition is in place, in which case 0 is also allowed.

Table 1: Summary statistics for 10 institutions

Institution	2001	2006	2009
Democracy and Civil Liberties	2.997	3.042	3.06
	(.829)	(.805)	(.804)
Security and Order	2.98	3.101	3.067
	(.577)	(.539)	(.562)
Dispersion of Power	2.253	2.5	2.478
	(.764)	(.707)	(.721)
Social Cohesion and Social Dialogue	2.679	2.722	2.782
	(.592)	(.598)	(.465)
Property Rights and Rule of Law	2.556	2.735	2.730
	(.811)	(.691)	(.731)
Government Capacities	2.523	2.755	2.708
	(.670)	(.558)	(.556)
Transparency and Accountability	2.518	2.722	2.774
	(.728)	(.670)	(.643)
Economic Openness	2.626	2.728	2.756
	(.647)	(.595)	(.569)
Social Openness	2.913	2.978	2.904
	(.564)	(.523)	(.522)
Intervention in the Economy	2.814	2.877	2.913
	(.730)	(.664)	(.582)
All institutions	2.686	2.816	2.817
	(.603)	(.535)	(.531)

Table 2 presents the mean values and standard deviations for the 7 policy measures constructed out of the 4-digit items. Similarly to the previous institutional dimensions, the scale ranges from 0 to 4, where 4 represts higher quality policies (although in the case of policies the interpretation is less straightforward and there is larger room for controversy about what is a better policy).[7]

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[7]It is advisable to see the items included in each dimension (Annex 7.2) in order to help interpreting the policy variables.

Table 2: Summery statistics for 7 policy areas

Policy Area	2001	2006	2009
Social Policy	2.206	2.319	2.485
	(.911)	(.917)	(.846)
Subsidies and Price Controls	2.732	2.81	2.752
	(.835)	(.878)	(.861)
Intellectual Property Protection	2.216	2.289	2.284
	(1.011)	(1.04)	(.972)
Defence of Competition	2.353	2.373	2.34
	(.758)	(.805)	(.782)
Financial Policy	2.553	2.745	2.758
	(.62)	(.56)	(.541)
Labor Policy	2.775	2.745	2.724
	(.402)	(.423)	(.32)
Education and Training Policy	2.56	2.541	2.58
	(.738)	(.608)	(.651)
All policies	2.485	2.546	2.56
	(.605)	(.597)	(.587)
All policies (excluding financial policy)	2.474	2.513	2.527
	(.627)	(.628)	(.615)

Overall, it is possible to observe some differences between the behaviour of policies and institutions. Policies tend to have lower means and higher dispersions, a pattern that appears consistent with the expectation that policies diverge more across national settings. We also present averages for all policy areas excluding financial policy, as the latter dimension presents a rather distinctive behaviour compared to the other areas, with a higher mean value and a lower dispersion (the only exception being labor policy).

Throughout the reminder of the article the focus is put exclusively on the analysis of the 10 institutional variables.

3.2 Institutional change across regions

The summary statistics for each institution are informative of very general patterns of short-term institutional behaviour. It is, however, more interesting to show the variance of this evolution in the different world regions: 1) Asia and Pacific; 2) Western Europe and the United States; 3) Central and Eastern Europe; 4) Latin

America and the Caribbean; 5) Middle East and North Africa; and 6) Sub-Saharan Africa.

Figure 1 shows the evolution of Democracy and Civil Liberties. This dimension includes items measuring the level of electoral competition, as well as the extension of the basic liberties of citizens within a country's borders, such as freedom of assembly and demonstration, freedom of the press and freedom of movement.

There exists no unanimity in the definition of democracy. The concept has evolved over time, as the historical events unfolded in different regions of the world. Collier and Levitsky (1997) note that the concept has gone through much innovation, which to some extent led to the phenomenon of concept stretching (including too many cases under a concept without relaxing its definition). Munck and Verkuilen (2002) provide an extensive review of how democracy and democratization scholars have dealt with three methodological challenges: the conceptualization, the measurement and the aggregation of democracy. These authors stress that most of the definitions have remained procedural, meaning that no socio-economic welfare requirements are included.

The construction chosen here selects the two dimensions of free and fair elections and civil liberties. These two can be grounded on the idea of *contestation*, one of the two dimensions of a *polyarchy*, as famously conceptualized by Robert Dahl (1971).[8] In this context, contestation involves free and fair elections, freedom of organization, freedom of expression and pluralism of the media. The work of Dahl has had a profound impact in the democratization literature, and his theoretical foundations were subsequently used in the operationalization of the concept (Coppedge, Alvarez and Maldonado 2008). Overall similar dimensions have been used by other authors: contestation of executive and legistlative offices (Alvarez, Cheibub, Limongi and Przeworski 1996); political liberties and popular sovereignty (Bollen 1980); competitiveness of participation and executive recruitment (Marshall and Jaggers 2001); elections and political freedoms (Hadenius 1992).

This dimension is in line with the first institutional function of the IPD survey on political institutions, which involves public rights and freedoms, as well as legality and legitimacy levels (de Crombrugghe et. al. 2010). This dimension, however, includes civil freedoms related to access to information and freedom of movement.

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[8] A polyarchy is a political regime that allows public opposition and establishes the right to participate in politics (Coppedge and Reinicke 1990 p. 51). Apart from contestation, a second persistent dimension of a polyarchy is *inclusiveness*, understood as the degree to which the population is entitled to participate in politics and compete for power. No clear items of inclusiveness were detected in the panel IPD. However, this dimension has become somewhat obsolete, as it refers mostly to universal suffrage.

Figure 1: Evolution of Democracy and Civil Liberties per Region
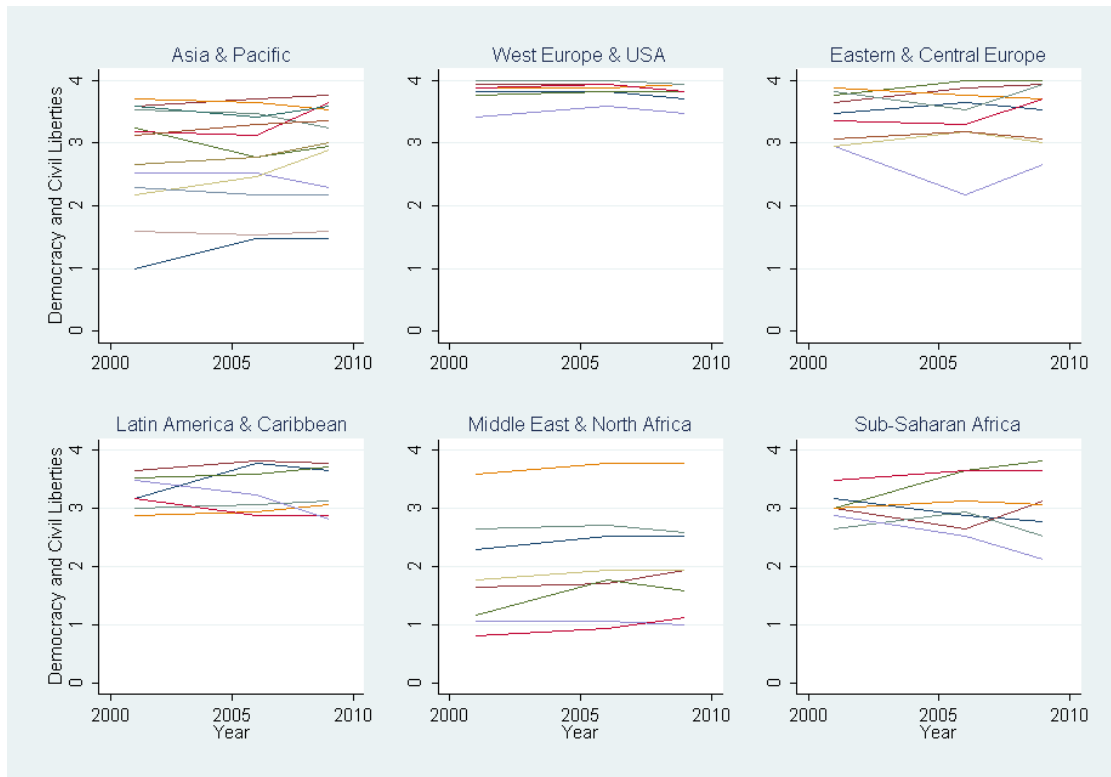
Changes in this dimension happen rather slowly over time. Countries are highly clustered in Western Europe, somewhat clustered in Eastern Europe, Latin America and Sub-Saharan Africa, and rather disperse in Asia and the Pacific and the Middle East and North Africa.

Figure 2 presents the evolution of Security and Order. This dimension is of rather straightforward interpretation, and it includes items measuring the level of conflict and violence within a country, as well as the power of the state to maintain overall stability. It measures to which extent security is threatened by underground organizations and organized criminal activity, as well as military tensions with other countries. This dimension preserves the essence of the second institutional function of the IPD survey Safety, law and order, control of violence (de Crombrugghe et. al. 2010) but includes items on freedom of movement for nationals and foreigners.

In this case, the dispersion within regions is more similar than in the case of Democracy and Civil Liberties, and changes happen faster in time. It is possible to

observe an overall downward trend in Western Europe, and the opposite situation in Eastern Europe, whereas patterns of change are less clear in the other four regions.

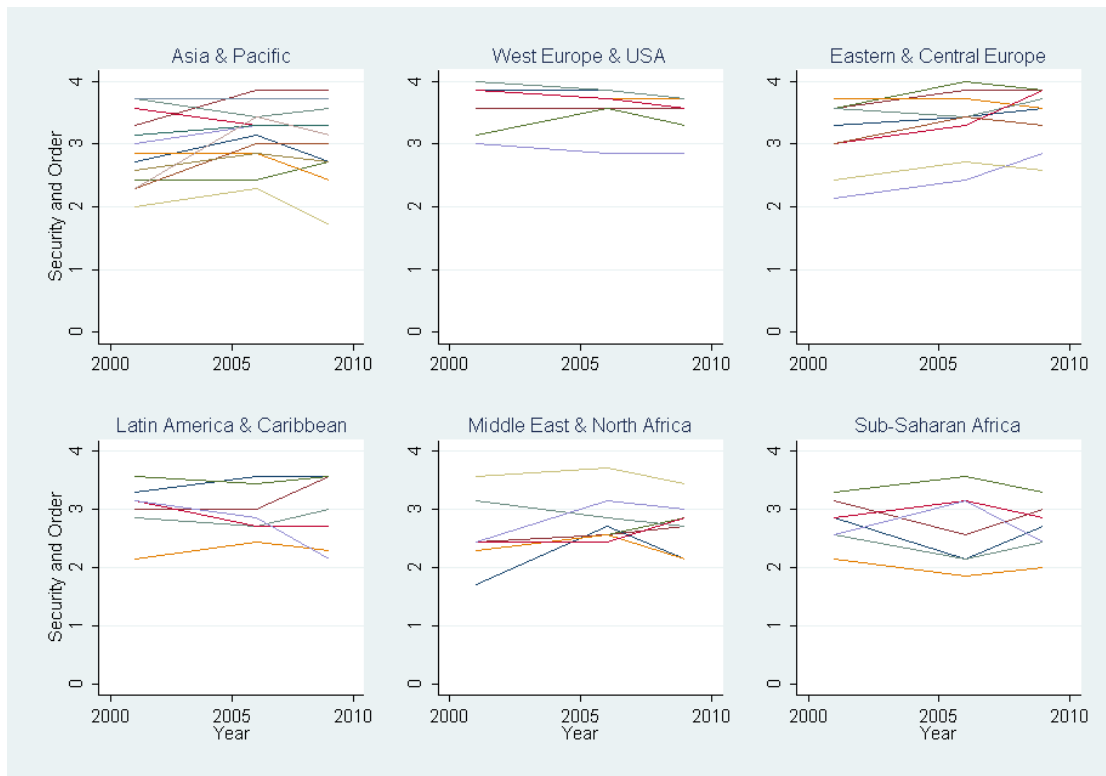Figure 2: Evolution of Security and Order per Region

Figure 3 presents the values of distribution of power institutions. This category refers to the distribution of power within a polity, both vertically and horizontally. Vertical distribution of power is the extent to which power is allocated to sub-national and local polities within a country (a typical example would be to distinguish between unitary and federal governmental structures). Horizontal distribution of power refers to the way in which power is allocated between and within branches: the executive, the legislative and the judiciary.

There is a rather vast literature on the idea of dispersion of power institutions, ranging from debates on presidential versus parliamentary regimes (Linz 1990, Shugart and Carey 1992, Sartori 1997) to more comprehensive frameworks such as the work on veto players and veto points (Tsebelis 1995). In all cases, the matter

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under scrutiny is how many relevant decisional players exist within a polity and to which extent policies are delegated to different governmental levels.

Although this dimension is of promising value for analysis, it is worth mentioning that after compiling the panel dataset, items belonging to only two aspects remained: decentralization levels, and judiciary and central bank independence. Ideally, this dimension should be nourished with data on parliamentary and cabinet composition, party system characteristics, etc.

When assessing regional regularities, it is somewhat striking to see that the developing world scores much lower on this dimension than in others (democracy, for example). This can be observed in the boxes corresponding to Latin America, Sub-Saharan Africa and the Middle East and North Africa, where Israel stands as an outlier.

Figure 3: Evolution of Dispersion of Power Institutions per Region
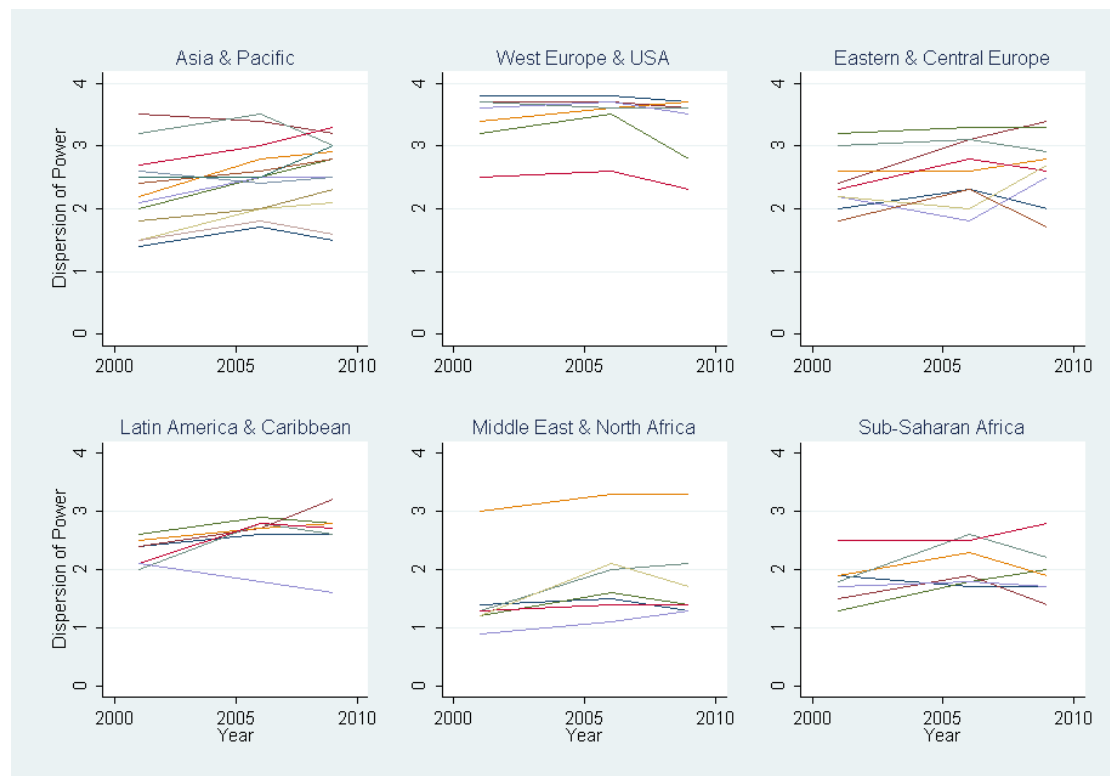

Figure 4 shows the short-term evolution of social dialogue and social cohesion measures. This dimension gathers items informative of the level of social segregation,

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market segmentation due to ethnicity, gender or religion, levels of social protest and the existence of institutionalized dialogue channels between workers and firms. There is an overall upward trend for the Middle East and North Africa, and Sub-Saharan Africa, but there are less clear patterns in the other regions.

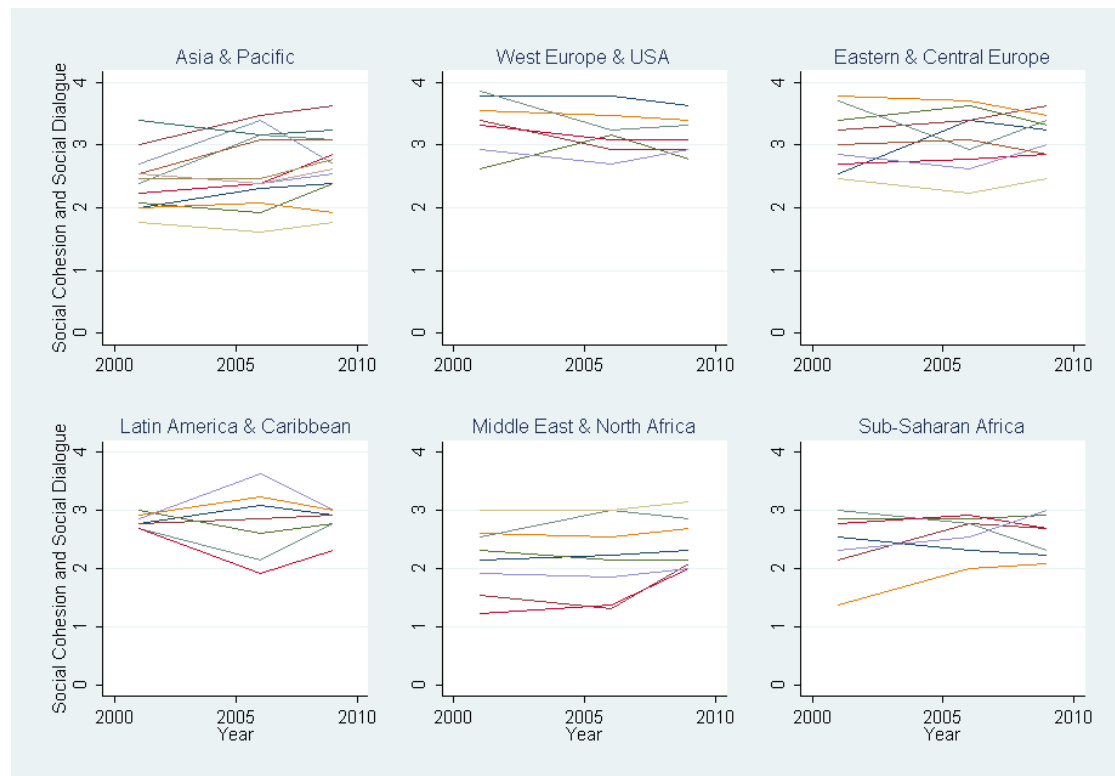Figure 4: Evolution of Social Cohesion and Social Dialogue per Region

Figure 5 shows the short-term evolution of property rights and rule of law. This dimension gathers items that grant information on the security of private property, the quality of private and public contracting institutions, the level of expropriation compensation, and overall judicial guarantees against state action. The idea of property rights as a fundamental institutional dimension has encountered several and prominent proponents (North, 1990; Acemoglu Johnson and Robinson 2001; Acemoglu and Johnson 2005; North, Wallis and Weingast 2009).

It is interesting to note the rather low but stable values for the Middle East and North Africa, in contrast to the highly fluctuating values of Sub-Saharan Africa. Also on this dimension there is an overall upward trend for Central and Eastern

Europe, although with higher dispersion than in other dimensions.

Figure 5: Evolution of Property Rights and Rule of Law per Region

Figure 6 presents data on government capacities. This dimension mainly refers to the capacity of the government to implement its desired policies. It includes items assessing the level of governmental planning, as well as its steering and regulatory capacity. Geddes (1996) defines state capacity as the capacity to translate preferences into actions, which in turn depends on effective bureaucratic organizations (pp. 14). This concept relates to some extent to the literature on state autonomy (Skocpol 1979; Evans, Rueschemeyer and Skocpol, 1985), as it assigns preferences for the state as something somewhat differentiated from other sectors of the society. Yet, the works on state capacity evolved in order to conceive the state as a non-monolitic actor, with overlapping and often contradicting incentive structures among its players. In this dimension both Western and Eastern Europe show greater variance than in other dimensions. The former presents an overall downward trend, which contrasts with Eastern Europe as well as the Middle East and North Africa. Asia and Pacific presents more dramatic fluctuations in this

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category than the other regions.

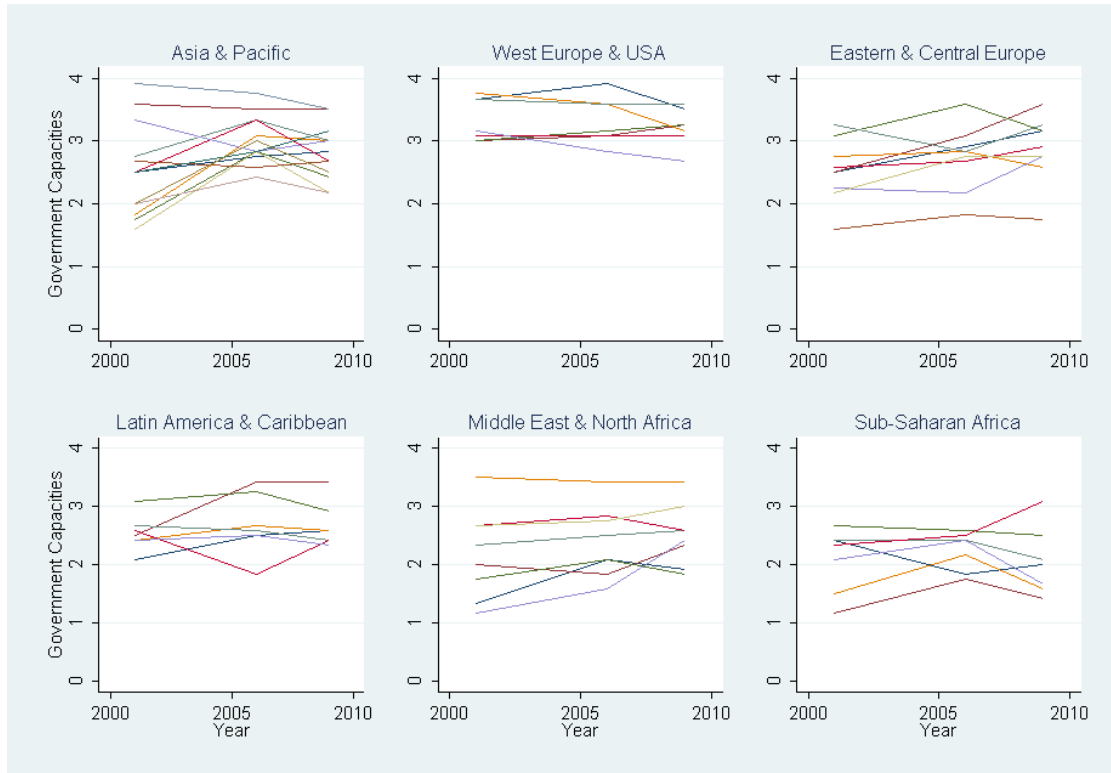Figure 6: Evolution of Government Capacities per Region

Figure 7 shows the evolution of the transparency and accountability dimension across regions. This dimension gathers items relating to the availability of information regarding sensitive and relevant public issues, the level of large and small-scale corruption and the oversight power of both governmental and societal institutions. In this context, it reveals the level of transparency in governmental accounts, the quality of official communications, the quality of accounting systems in the private sector, the existence and power of supervisory bodies, among others. This dimension cuts across different sectors of the economy.

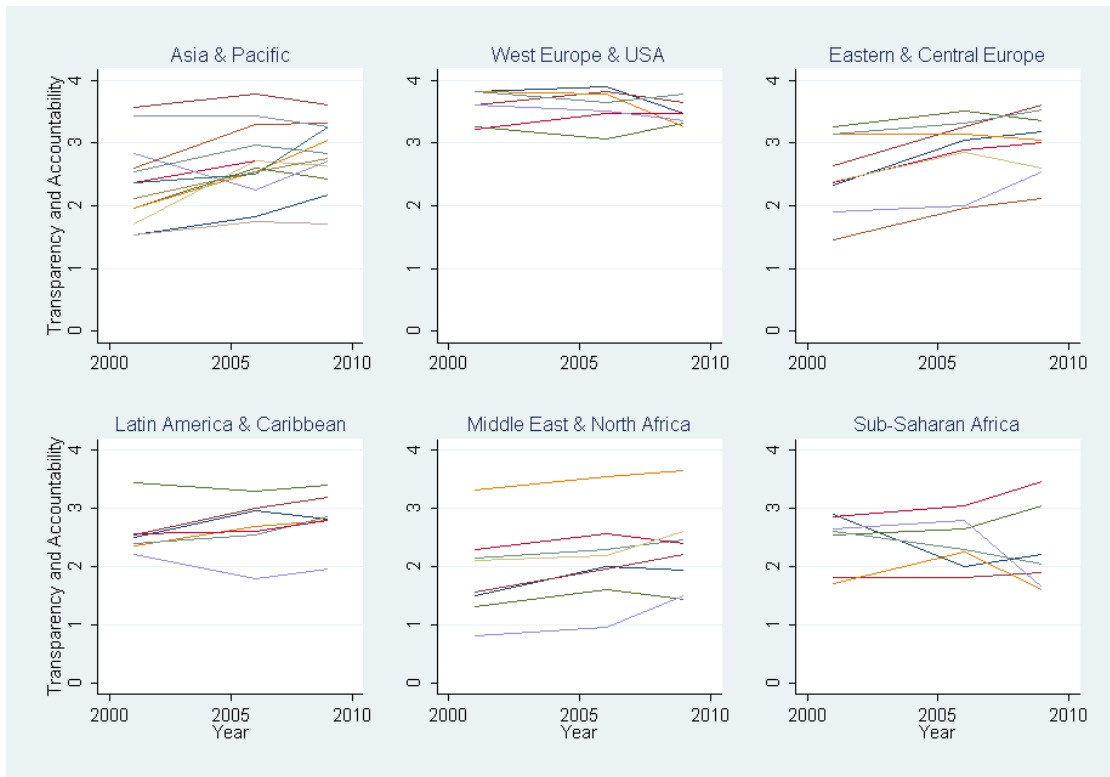Figure 7: Evolution of Transparency and Accountability per Region

Figure 8 presents time-series plots regarding the degree of openness of the economy. This dimension mainly refers to two factors: the level of market competition and the degree of market internationalization. It includes information on differences between local and international standards in different sectors of the economy, the degree to which markets are managed by few and traditional players, the easiness for foreign capital to establish in the country, among others.

Countries appear highly clustered in Western Europe, Latin America and Sub-Saharan Africa and quite dispersed in the other regions. On this dimension, very few countries score lower than 2: China, Algeria, Egypt, Tunisia and Zimbabwe in 2001, and Iran, Syria and Vietnam in all three periods. In general terms, the mean values for this variable increase over time.

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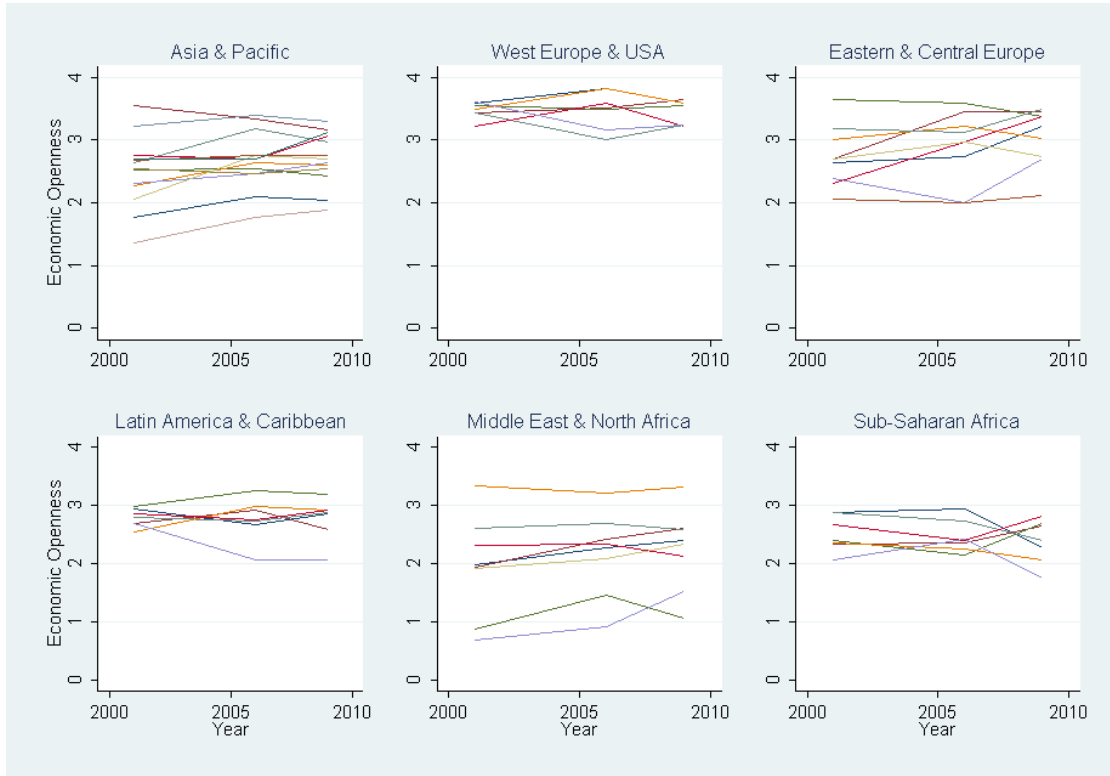Figure 8: Evolution of Economic Openness per Region

Figure 9 shows the short-term evolution of social openness. This dimension seeks to reveal the level of segregation in society, the willingness to accept changes, the importance of personal ties for mobility and overall social equality. Items here range from the society's responsiveness to change in different areas, to freedoms to access information; gender, ethnic and religious segregation, and the role of family in finding a job. Along with Democracy and Civil Liberties, this is a rather slow-moving institution. Countries in all regions tend to be more clustered than in other dimensions.

Figure 9: Evolution of Social Openness per Region
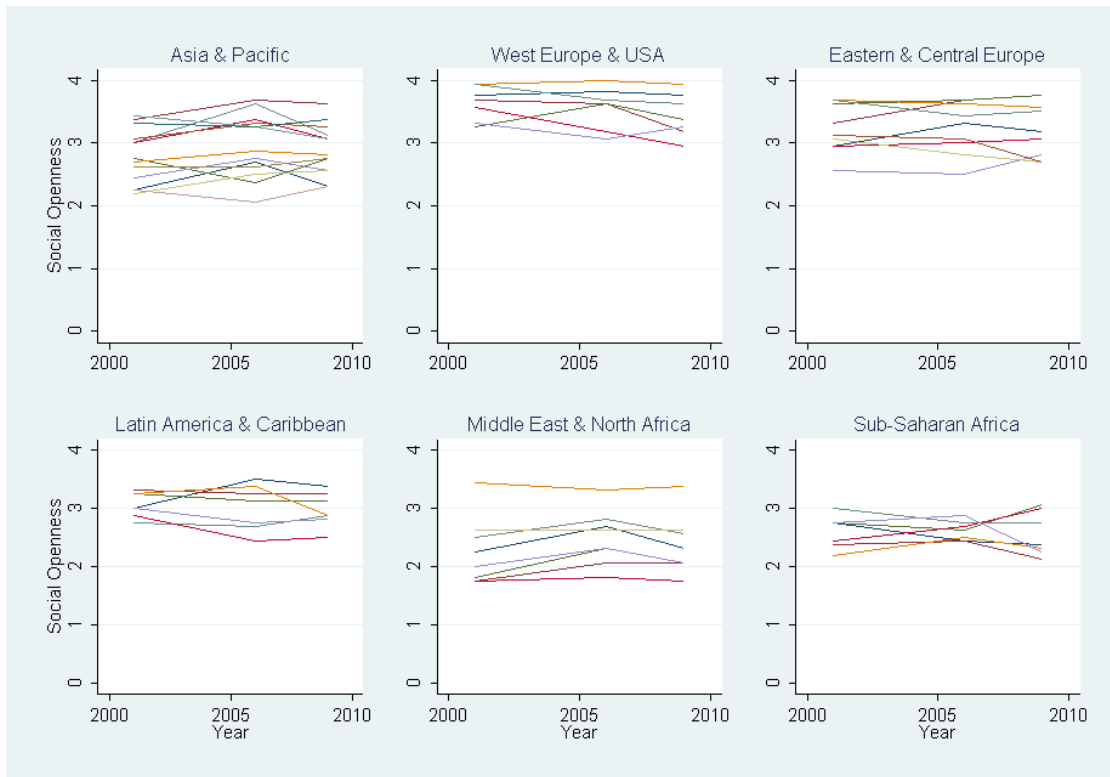
Finally, figure 10 presents data on the level of governmental intervention in the economy, understood as the implementation of measures that alter market prices, such as the introduction of subsidies and price controls. Although it partially overlaps with the dimension of economic openness, it is a more specific variable that captures short-term fluctuations and does not necessarily inform about the overall internationalization or competitiveness of the economy. It is worth noting that although the title for the dimension is intervention, a higher score means less intervention.

On this dimension, countries present rather dispersed measures within regions, and substantial short-term fluctuations. It is of no surprise that this institution behaves more in line with the short-term change in policies.

Figure 10: Evolution of Intervention in the Economy per Region
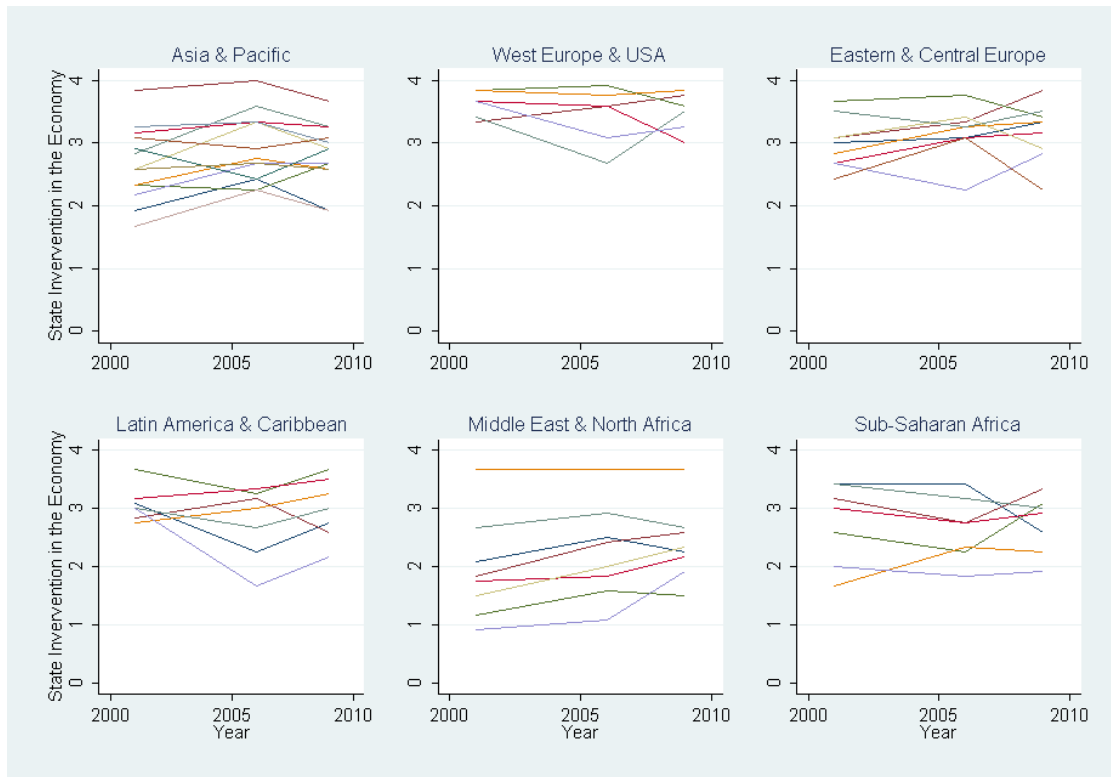
4 Institutional Change: convergence and improvement?

The data presented in Table 1 suggests that some patterns are present in the short-term evolution of the 10 institutional dimensions. First, the standard deviation of each institution tends to decrease from one wave to the next. Secondly, it can be observed that the mean values for 9 out of the 10 dimensions increase over time, in particular when comparing 2001 to 2006/2009. This section explores the extent to which these preliminary findings can be further substantiated statistically.

In order to better visualize the short-term evolution of the dispersion in institutional scores, Figure 11 presents a time-series plot of the standard deviations of all institutions, showing an overall downward trend. The dimensions Democracy and Civil Liberties and Security and Order show the least convergence, whereas Social

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Cohesion, Property Rights and Intervention in the Economy show the strongest convergence. A one-sided comparison of means test assessing the statistical significance of the difference in means between the 2001 wave and the remaining two gives a p-value of 0.0431. This value can be interpreted as rejecting the hypothesis that the difference between the means of 2001 and those of 2006 and 2009 (as one group) is zero or positive (at the 5% significance level). Thus, the idea of short-term institutional convergence finds some support in the evidence gathered here. The p-values corresponding to comparisons between either 2001 and 2009 alone, or 2006 against any of the other two do not meet the same statistical significance.

Figure 11: Short Term Evolution of Institutional Dispersion
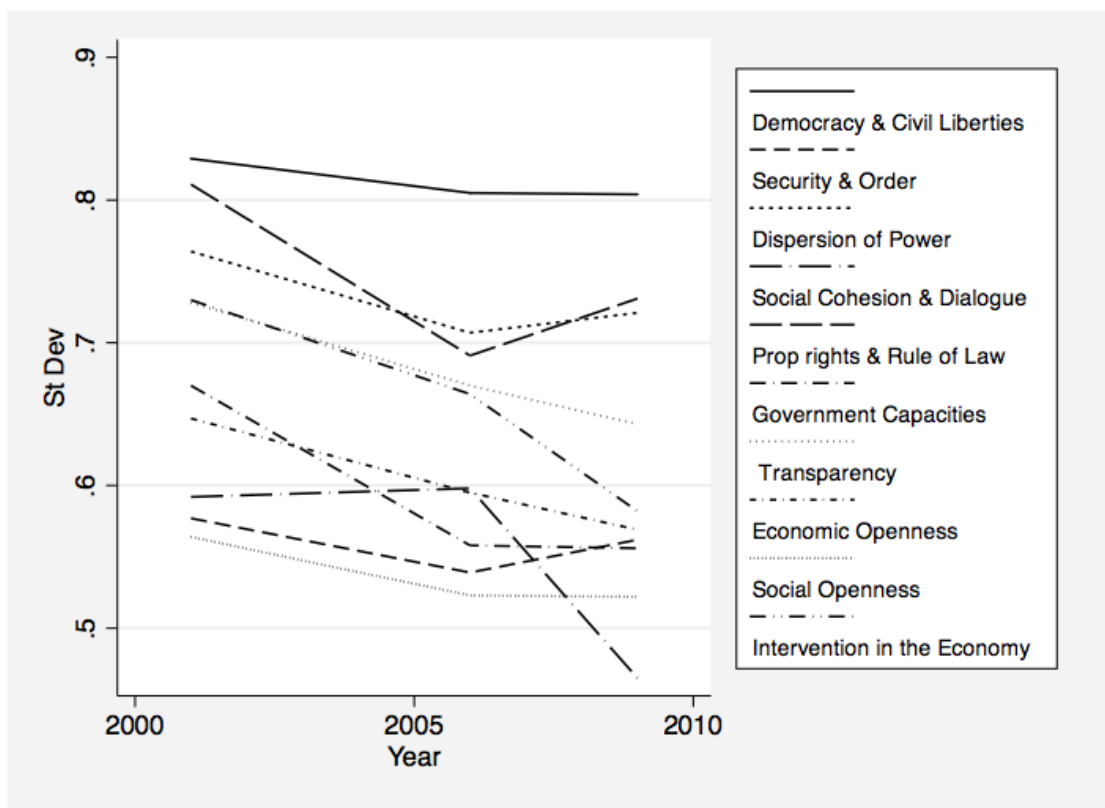
In order to assess the second preliminary finding suggesting that institutional quality has increased between 2001 and 2009, we propose to test the model:

$$I_{k,i,j} = \gamma_k + \alpha_i + \beta_1 D_{2006} + \beta_2 D_{2009} + u_{k,i,j} \tag{1}$$

Where $I_{k,i,j}$ is the institutional level (ranging from 0 to 4) for k institutional dimensions, i countries and j waves; γ_k are the fixed effects of the 10 institutions; α_i are the fixed effects for the 51 countries; D_{2006} is a dummy for the year 2006, and D_{2009} is a dummy for the year 2009; and $u_{k,i,j}$ is the error term. This leaves a total of 1530 observations.

Table 3 presents the results. Dummies for most of the institutional variables are significant, having democracy as baseline for comparison. The results also show a coefficient of 0.13 points for the year 2006 dummy and 0.132 for 2009. These results are significant at the 1% level. The coefficients and standard errors remain similar after including fixed effects.

These estimations suggest that improvements in the institutional scores over the years are statistically significant. The reader should be warned, however, about the fact that IPD data is collected from surveys that measure perceptions on the reality, which might be influenced by expectations of change, more than real change. The effects of real and perceived change cannot be distinguished here, although it can be expected that perception biases have a rather erratic behavior, not consistent with the pattern uncover here.

Table 3: Institutional change: time effects.

Variable	Coefficient (Std. Err.)	Coefficient (Std. Err.)
Security	0.017	–
	(0.042)	
Dispersion of Power	-0.622**	–
	(0.042)	
Cohesion	-0.305**	–
	(0.042)	
Property Rights	-0.359**	–
	(0.042)	
Capacities	-0.371**	–
	(0.042)	
Transparency	-0.362**	–
	(0.042)	
Economic Openness	-0.329**	–
	(0.042)	
Social Openness	-0.101*	–
	(0.042)	
Intervention	-0.164**	–
	(0.042)	
Year 2009	0.132**	0.132**
	(0.023)	(0.026)
Year 2006	0.130**	0.130**
	(0.023)	(0.026)
Intercept	3.077**	2.817**
	(0.033)	(0.018)
N	1530	1530
R^2	0.714	0.638
F	39.208	16.884

Significance levels :   † : 10%   ∗ : 5%   ∗∗ : 1% . Fixed effects for countries included.

5   Short-term change in Institutions and Growth

Although the data arising from the three waves of the IPD database are somewhat limited when performing thorough assessments, it has been possible to detect some basic patterns that cannot be projected outside the range of time and space considered. After this first approximation to testing the hypotheses of institutional

improvement and convergence, it is the aim of this section to explore the short-term associations between economic growth and institutional change given the data that is available. We aim to estimate:

$$\triangle Y_{i,t} = \alpha + \beta_1 Y_{i,t-1} + \beta_2 \triangle X'_{i,t} + \beta_3 D_{2006} + \beta_4 D_{2009} + u_{i,t} \qquad (2)$$

Where $\triangle Y_{i,t}$ is the difference in the ln of GDP per capita in country i at time t (t = 2001, 2006, 2009)[9]; $Y_{i,t-1}$ is the lag of the ln of GDP per capita; $\triangle X'_{i,t}$ is a vector containing the first differences of the 10 institutional dimensions, D_{2006} is a dummy for the year 2006; D_{2009} is a dummy for the year 2009; and $u_{i,t}$ is the error term. In this estimation, delta ($\triangle$) indicates changes over the period spanned by the two IPD waves (either 5 or 3 years) instead of the more usual year-by-year difference operator.

Table 4 presents the results. The model in column I shows the coefficients and standard errors including all 10 institutional variables. None of the time dummies are significant in this case. Of all ten institutional dimensions, only property rights and rule of law, and security and order appear significant at the 1% level. The lag of GDP level results significant at the 10% level. The model in column II presents the last step of a pairwise regression, where irrelevant terms are progressively removed. The variables retained are also the lag of GDP per capita at the 10% level, and security and order and property rights at the 1% level. Only the coefficient for property rights changes substantially when irrelevant terms are removed, suggesting that collinearity among the institutions is not a big problem.[10] The R^2 decreases marginally from 0.64 to 0.62.[11]

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[9]GDP measures are taken in constant prices, from Penn World Tables (chain series).

[10]A test of joint significance for the irrelevant terms gives an F statistic of 1.02 and a p-value of 0.42, meaning that the terms are jointly not significantly different from zero.

[11]In order to better visualize the relationships between variables and the coefficients, refer to the scatter matrices in Annex 7.3.

Table 4: Stepwise regression: institutions on growth

Dependent variable: $\triangle$ Log of GDP per capita	I	II
Lag of ln GDPcap	-0.105†	-0.119†
	(0.058)	(0.064)
Democracy and Civil Liberties ($\triangle_t$)	-0.086	
	(0.158)	
Security and Order ($\triangle_t$)	0.334**	0.311**
	(0.102)	(0.095)
Dispersion of power ($\triangle_t$)	0.278	
	(0.218)	
Social Cohesion and Dialogue ($\triangle_t$)	0.015	
	(0.173)	
Property Rights and Rule of Law ($\triangle_t$)	0.463**	0.716**
	(0.171)	(0.087)
Government Capacities ($\triangle_t$)	0.092	
	(0.139)	
Transparency ($\triangle_t$)	-0.021	
	(0.211)	
Economic openness ($\triangle_t$)	0.334	
	(0.223)	
Social openness ($\triangle_t$)	-0.100	
	(0.200)	
Intervention in the Economy ($\triangle_t$)	-0.212	
	(0.148)	
Year 2006	-0.161	
	(0.135)	
Year 2009	-0.191	
	(0.136)	
Intercept	0.861	1.062†
	(0.550)	(0.607)
N	152	152
R^2	0.642	0.619
F	15.192	44.984

Significance levels : $\dagger : 10\%$ $* : 5\%$ $** : 1\%$

6 Conclusions

The Institutional Profiles Database is a source of institutional and policy data designed and produced by the Agence Française de Développement (AFD), and has been carried out in 2001, 2006 and 2009. As the survey structure has been expanded and enhanced after the 2006 wave, the three databases cannot be combined for time series analysis in a straightforward way. However, after individually selecting the 4-digit items (survey questions) that are comparable across waves, a panel database for 51 countries and 159 variables could be assembled.

In order to synthesize the information for analysis, and to make the data interact with the literature on institutions, a total of ten institutional dimensions and seven policy variables were constructed out of the 159 items. A descriptive analysis of the short-term evolution of these variables shows that countries tend to cluster by region of the world, and that the behavior of institutions varies according to the nature of the institution itself. In general terms, the 10 institutions assessed show a more predictable and slow-moving behavior than the 7 policy variables.

Two hypotheses were put to test: a) that institutions converge over time; and b) that the level of institutional maturity increases overtime, independently of the country fixed effects. The two hypotheses find preliminary empirical support, although the difference holds only for the comparison between 2001 and 2006/2009, and not between 2006 and 2009. One interpretation possible is that the 2008 global financial crisis made the perception of institution retract. Another possibility is simply that the evolution of the institutions analyzed needs further evidence to distinguish between contextual shocks and longer term trends. This suggests that the results should be cautiously interpreted and further evidence is needed from the forthcoming waves of the survey.

Another interesting (yet preliminary) finding is that once the data is differenced (i. e. once we use deltas instead of levels), it is possible to observe associations between some institutional dimensions and the growth of GDP per capita. The findings are consistent with the strand of literature suggesting that security and order, and the maintenance of property rights appear to be important conditions for growth.

Regardless of the many angles that future research can take after better profiting from the panel dimension of the IPD database, it is important to stress that the time-dimension proves useful in providing new insightful ideas and reassessing the evidence coming from purely cross sectional analyses.

References

Acemoglu, D. and Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy*, 113(5):949–995.

Acemoglu, D., Johnson, S., and Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*, 91(5):1369–1401.

Acuña, C. H. and Tommasi, M. (2000). Some reflections on the institutional reforms required for latin america. In *Institutional Reforms, Growth and Human Development in Latin America*, volume 1. Yale University, Center for International and Area Studies.

Alvarez, M., Cheibub, J. A., Limongi, F., and Przeworski, A. (1996). Classifying political regimes. *Studies In Comparative International Development*, 31:3–36.

Bollen, K. A. (1980). Issues in the comparative measurement of political democracy. *American Sociological Review*, 45(3):370–390.

Collier, D. and Levitsky, S. (1997). Research note: Democracy with adjectives: Conceptual innovation in comparative research. *World Politics*, 49(3):430–451.

Coppedge, M., Alvarez, A., and Maldonado, C. (2008). Two persistent dimensions of democracy: Contestation and inclusiveness. *The Journal of Politics*, 70(03):632–647.

Coppedge, M. and Reinicke, W. H. (1990). Measuring polyarchy. *Studies In Comparative International Development*, 25:51–72.

Dahl, R. A. (1971). *Polyarchy: participation and opposition*. Yale University Press.

DeCrombrugghe, D. and Farla, K. (2011). Preliminary conclusions on institutions and economic performance. Working paper, Agence Française de Développement.

DeCrombrugghe, D., Farla, K., DeNeubourg, C., Ould Aoudia, J., and Szirmai, A. (2010). Presentation of the institutional profiles database 2009 (IPD 2009) III. Technical Report Working Paper, Agence Française de Développement.

DiMaggio, P. J. and Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2):pp. 147–160.

Evans, P. B., Rueschemeyer, D., and Skocpol, T. (1985). *Bringing the state back in*. Cambridge University Press.

Geddes, B. (1996). *Politician's dilemma: building state capacity in Latin America.* University of California Press.

Greif, A. and Laitin, D. D. (2004). A theory of endogenous institutional change. *American Political Science Review*, 98(04):633–652.

Hadenius, A. (1992). *Democracy and development.* Cambridge University Press.

Kingston, C. and Caballero, G. (2009). Comparing theories of institutional change. *Journal of Institutional Economics*, 5(02):151–180.

Krasner, S. D. (1984). Approaches to the state: Alternative conceptions and historical dynamics. *Comparative Politics*, 16(2):223–246.

Linz, J. J. (1990). The perils of presidentialism. *Journal of Democracy*, 1(1):51–69.

March, J. G. and Olsen, J. P. (1989). *Rediscovering institutions: the organizational basis of politics.* Simon and Schuster.

Marshall, M. and Jaggers, K. (2001). Polity IV project: Political regime characteristics and transitions, 1800-2001. dataset users manual.

Munck, G. L. and Verkuilen, J. (2002). Conceptualizing and measuring democracy. *Comparative Political Studies*, 35(1):5 –34.

North, D. C. (1990). *Institutions, Institutional Change and Economic Performance.* Cambridge University Press.

North, D. C. (2006). *Understanding The Process Of Economic Change.* Academic Foundation.

North, D. C., Wallis, J. J., and Weingast, B. R. (2009). *Violence and Social Orders.* Cambridge Books. Cambridge University Press.

Sartori, G. (1997). *Comparative constitutional engineering: an inquiry into structures, incentives, and outcomes.* New York University Press.

Shugart, M. S. and Carey, J. M. (1992). *Presidents and assemblies: constitutional design and electoral dynamics.* Cambridge University Press.

Skocpol, T. (1979). *States and social revolutions: a comparative analysis of France, Russia, and China.* Cambridge University Press.

Tsebelis, G. (1995). Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. *British journal of political science*, 25(03):289–325.

Tushman, M. L. and Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. *Research in Organizational Behavior*, 7:171–222.

7 Annex

7.1 Countries included in the IPD panel database

Asia and Pacific	China; Hong Kong; Indonesia; India; Japan; Korea, South; Malaysia; Pakistan; Philippines; Singapore; Taiwan; Thailand; Vietnam.
Western Europe and the USA	Germany; France; Greece; Ireland; Norway; Portugal; United States.
Central and Eastern Europe	Bulgaria; Czech Republic; Hungary; Lithuania; Poland; Romania; Russia; Turkey; Ukraine.
Latin America and Caribbean	Argentina; Brazil; Chile; Colombia; Mexico; Peru; Venezuela.
Middle East and North Africa	Algeria; Egypt; Iran; Israel; Morocco; Saudi Arabia; Syria; Tunisia.
Sub-Saharan Africa	Cote d'Ivoire; Cameroon; Ghana; Nigeria; Uganda; South Africa; Zimbabwe.

7.2 Conceptual Aggregation of IPD panel

I - Institutions
1 - Democracy and Civil Liberties
a- Democracy
a1000: Freedom and legality of elections
a1004: Participation of armed forces in political life, de jure or de facto
b- Civil liberties
a1030: Freedom of the press
a1031: Freedom of association
a1032: Freedom of assembly and demonstration
a1033: Respect for law in relations between citizens and the administration
a3052: De facto equality of treatment of foreigners (compared to nationals)
a8000: Freedom of movement of nationals (exit)
a8001: Freedom of movement of foreigners (entry)
a8002: Freedom of access to the foreign press (no seizures, etc.)
a8003: Freedom of television access (cable, satellite, etc.)
a8004: Freedom of Internet access
d1000: Right to strike in the private sector

d1001: Right to strike in the public sector and the civil service
d1002: Freedom of collective bargaining in firms
d1003: Freedom of trade union operation in firms
d1010: Right to organise trade unions
2 - Security and Order
a2000: Security of persons and goods
a2001: Conflicts of ethnic, religious, regional nature
a2002: Violent actions by underground political organisations
a2003: Organised criminal activity (drug-trafficking, arms-trafficking, etc.
a2030: Military tensions with other countries (excluding military intervention under international mandate)
a8000: Freedom of movement of nationals (exit)
a8001: Freedom of movement of foreigners (entry)
3 - Dispersion of Power Institutions
a- Decentralization
a1070: Are the municipal authorities elected or appointed by central government?
a1071: Are the other local authorities (States in the case of federations, Regions, Provinces, etc) elected or appointed by central government?
a1080: Extent of municipal authorities' autonomy in fiscal matters
a1081: Extent of other local authorities' autonomy in fiscal matters
b- Justice independence
a3050: Independence of the justice system from Government
a3053: Extent of enforcement and speed of rulings
a6020: Independence of the courts from the government in commercial disputes
a6021: Independence of the courts from litigants (local players) in commercial disputes.
a6023: Extent of enforcement and speed of rulings in commercial matters
c- Central Bank Independence
c4025: Independence of the Central Bank
4 - Social cohesion and social dialogue
a- Social cohesion
a1034: Respect for minorities (ethnic, religious, linguistic, etc)
a2001: Conflicts of ethnic, religious, regional nature
a9030: Gender-based segregation
a9031: Ethnic or caste-based segregation
a9032: Religious segregation
d9010: Segmentation of the labour market by origin (ethnic, religious, caste, etc)
d9050: Do young graduates experience a higher unemployment rate than the average unemployment rate?
b- Social dialogue
d7000: Main wage bargaining level

d7010: Strikes in the public sector
d7011: Strikes in the private sector
d7030: Functioning of labour-management dialogue within firms
d7031: Functioning of labour-management dialogue at national level
5 - Property Rights and Rule of Law
a1033: Respect for law in relations between citizens and the administration
a3050: Independence of the justice system from Government
a3053: Extent of enforcement and speed of rulings
a6000: Effectiveness of legal measures to defend property rights between private agents
a6001: Compensation in the event of de jure or de facto expropriation of land property (by the government or the local authorities)?
a6002: Compensation in the event of de jure or de facto expropriation of property for production (by the government or the local authorities)?
a6003: Generally speaking, does the government exert arbitrary pressure on private property (red tape, etc)?
a6010: Respect for written contracts (without mediation)
a6011: Respect for contracts with private mediation (lawyers, etc.)
a6012: Respect for contracts between local private players and foreigners
a6020: Independence of the courts from the government in commercial disputes
a6021: Independence of the courts from litigants (local players) in commercial disputes.
a6022: Equality of treatment between nationals and foreigners as regards commercial disputes
a6023: Extent of enforcement and speed of rulings in commercial matters
a6030: Bankruptcy law
6 - Government Capacities
a2000: Security of persons and goods
a3125: Consistency and continuity of government action in non-political matters
a3113: Government's authority over the administration
a5020: Is government action guided by a long-term strategic vision?
a5030: In particular, does the government have a strategy for the development of human capital (training, health, etc.)?
a5031: In particular, does the government have an environmental protection strategy?
a5032: In particular, does the government have an international or regional integration strategy?
c7030: Banking supervisory authority
c7031: Financial markets supervisory authority
c7032: Insurance market supervisory body
c7051: Tighter prudential rules for the financial system
d6010: Labour inspectorate
7 - Transparency and accountability

a3000: Transparency of Government budget
a3001: Transparency of Extra-budgetary funds
a3002: Transparency of Accounts of state-owned enterprises
a3003: Transparency of Accounts of public banks
a3004: Transparency of basic economic and financial statistics (national accounts, price indices, foreign trade, currency and credit, etc)
a3005: Is the IMF consultation under Article IV published?
a3010: Is economic policy the subject of an official communication
a3011: Is economic policy the subject of public debate
a3020: Level of "petty" corruption (between citizens and administrations)
a3021: Level of "large scale" corruption (between administrations and local firms)
b4020 : Transparency of privatisation procedures
b6000: Standard accounting system (SMEs)
b6001 : Standard accounting system (large firms)
b6002: Certification of company accounts (SMEs)
b6003 : Certification of company accounts (large firms)
b6004: Intervention of international auditing firms
b6012 : International norms and standards (ISO, Codex, etc)
b7040: Level of information on the structure of shareholdings in local firms
c6000: Standard accounting system
c6001: Certification of banks' accounts
c6020: Is there a publication requirement for issuing firms?
c7030: Banking supervisory authority
c7031: Financial markets supervisory authority
c7032: Insurance market supervisory body
c7040: Internal monitoring and autditing arrangements for private banks
c7041: Internal monitoring and autditing arrangements for public banks
c7052: Closer supervision of the financial system
d6010: Labour inspectorate

8 - Economic Openness

a1041: Degree of concentration of private media
a6060: Generally speaking, are unprofitable firms put into liquidation or kept in business?
b4040: Proportion of administered prices
b4041: Direct commodity price subsidies
b4042: Oil: deviation between local and market prices and world prices
b4020: Transparency of privatisation procedures
b4021 : Sale price close to market price
b4022: Have the privatisations benefited mainly the former company directors or rather new local or foreigner players?
b6031 : International arrangements: TRIPS agreement

b7000 : Administrative barriers in practice (red tape, etc.)
b7001: De facto barriers due to established competing firms' practices
b7020 : Existence of arrangements to combat restrictive collective agreements (cartels, etc.)
b8000: Convertibility for current transactions
b8001: WTO membership
b8002 : Issue of import licences
c4020: Administrative setting of interest rates
c4021: Quantitative credit controls
c4022: Compartmentalisation of banking system by law (loans to agriculture, industry, hotel sector, etc)
c4023: Managed lending (by sector, to public enterprises, etc.)
c7000: Generally speaking, is the banking system mainly made up of cartels or mainly competititve?
c7020: Difference between local and international capital adequacy standards (Cooke ratio, etc)
c7021: Difference between local and international standards in terms of rules limiting sector concentration of loans
c7022: Difference between local and international standards in terms of rules limiting sector concentration of loans to particular borrowers
c7023: Difference between local and international standards in terms of rules limiting banks' external exposure
c7050: Increase in the level of competition in the financial system
c8000: Openness of bank capital to foreign shareholdings
c8001: Right of establishment for foreign banks (deposit banks and investment banks)
c8002: Access of foreign-owned or partly-foreign-owned firms to loans from local banks
c8003: Access of local banking firms to international bank loans
c8004: Access of local firms to international financial markets
d8000: Positioning of foreign executives in local firms
d8001: Positioning of foreign executives in foreign firms

9 - Social Openness

a5080: Society's responsiveness to technological change and innovation
a5081: Society's responsiveness to managerial change and innovation
a5082: Society's responsiveness to legal and institutional change and innovation
a6022: Equality of treatment between nationals and foreigners as regards commercial disputes
a8001: Freedom of movement of foreigners (entry)
a8002: Freedom of access to the foreign press (no seizures, etc.)
a8003: Freedom of television access (cable, satellite, etc.)
a8004: Freedom of Internet access

a9030: Gender-based segregation
a9031: Ethnic or caste-based segregation
a9032: Religious segregation
a9040: Access to public education
a9043: Access to public sector employment
a9060: Healthcare coverage
d9030: Role of family, clan and social networks in recruitment and promotion in the administration
d9031: Role of family, clan and social networks in recruitment and promotion in private firms
10 - State Intervention in the Economy
a1040: Does the State control the content of the information in the different media, de jure or de facto?
a9080f: Direct commodity price subsidies
b4040: Proportion of administered prices
b4041: Direct commodity price subsidies
b4042: Oil: deviation between local and market prices and world prices
b4050 : Single exchange rate for commercial transactions
b4021: Sale price close to market price
b7000: Administrative barriers in practice (red tape, etc.)
c4021: Quantitative credit controls
c4022: Compartmentalisation of banking system by law (loans to agriculture, industry, hotel sector, etc)
c4023: Managed lending (by sector, to public enterprises, etc.)
II - Policies
11 - Social Policy
a9040: Access to public education
a9060: Healthcare coverage
a9061: Unemployment coverage
a9062: Retirement coverage
12 - Subsidies and Price Controls
a9080f: Direct commodity price subsidies (dropped)
b4040: Proportion of administered prices
b4041: Direct commodity price subsidies
b4042 : Oil: deviation between local and market prices and world prices
13 - Intellectual property protection
b6021: Intellectual property protection in terms of counterfeiting
b6030: Local arrangements for protection of intellectual property
b6031: International arrangements: TRIPS agreement
14 - Defence of competition

b7000: Administrative barriers in practice (red tape, etc.)
b7001: De facto barriers due to established competing firms' practices
b7020: Existence of arrangements to combat restrictive collective agreements (cartels, etc.)
15 - Financial and Banking Policy
b4050: Single exchange rate for commercial transactions
c4020: Administrative setting of interest rates
c4021: Quantitative credit controls
c4022: Compartmentalisation of banking system by law (loans to agriculture, industry, hotel sector, etc)
c4024: Lending directed towards Treasury financing
c5010: Government venture capital incentives
c6010: Mortgage guarantee system
c6011: Other system of guarantees required by the banks
c6020: Is there a publication requirement for issuing firms?
c7020: Difference between local and international capital adequacy standards (Cooke ratio, etc)
c7021: Difference between local and international standards in terms of rules limiting sector concentration of loans
c7022: Difference between local and international standards in terms of rules limiting sector concentration of loans to particular borrowers
c7023: Difference between local and international standards in terms of rules limiting banks' external exposure
c7051: Tighter prudential rules for the financial system
c8000: Openness of bank capital to foreign shareholdings
c8001: Right of establishment for foreign banks (deposit banks and investment banks)
c8002: Access of foreign-owned or partly-foreign-owned firms to loans from local banks
c8003: Access of local banking firms to international bank loans
c8004: Access of local firms to international financial markets
c9000: Informal micro-lending
c9001: Institutional micro-lending (supported by NGOs, banks, etc.)
16 - Labor Policy
d4000: Guaranteed employment for graduates in the public sector
d4001: Practice of guaranteed employment in the private sector ("lifelong employment" type)
d4002: De facto or de jure wage indexation to inflation
d6001: Minimum wage
d6002: Dismissal procedures
d6020: Protection against individual dismissal
d6021: Protection against mass redundancies

d6022:	Open-ended contracts as share of total employment contracts
d6010:	Labour inspectorate
d7000:	Main wage bargaining level
17 - Education and Training Policy	
a9040:	Access to public education
b5000:	Proportion of technical staff (engineers, technicians) in SMEs/SMIs
b5001:	Proportion of technical staff (engineers, technicians) in large firms
b5002:	Cooperation links between businesses, universities and research centres
d5000:	Adult vocational training
d5001:	Vocational training matched to firms' requirements?
d9051:	Tendency of firms to recruit graduates

7.3   Scatter matrices: institutions and policies

Figure 12: Scatter matrix of institutions

34
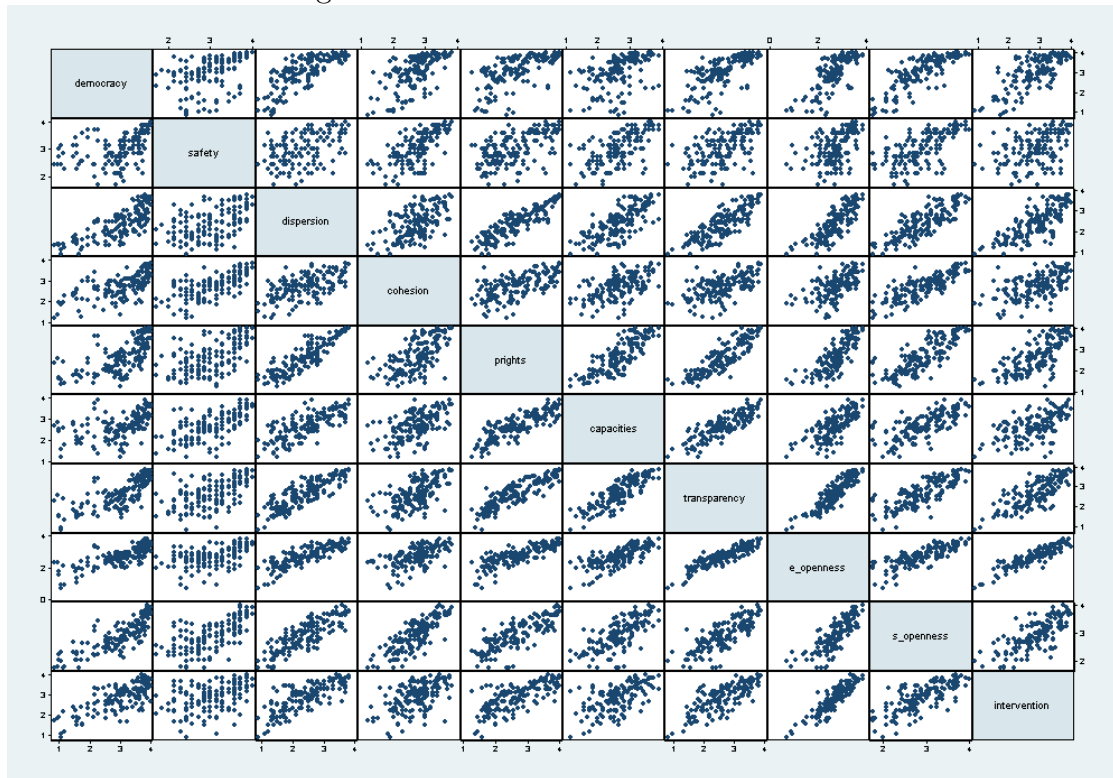
Figure 13: Scatter matrix of policies
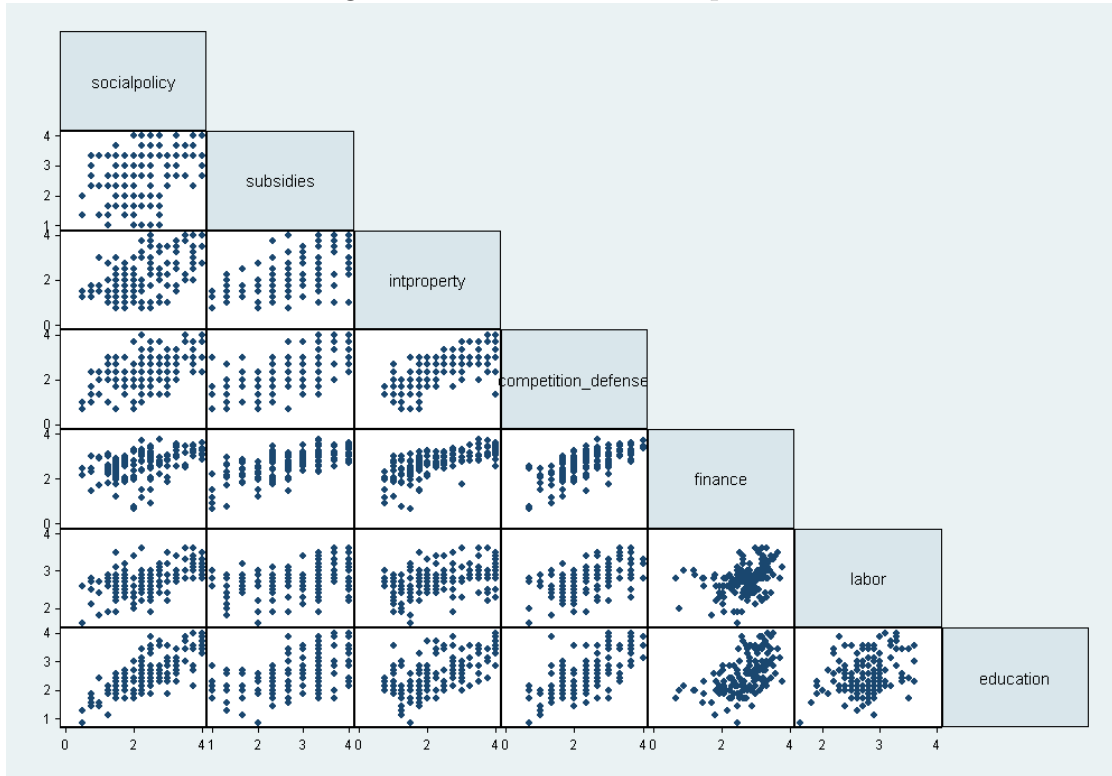
Figure 14: Scatter matrix of institutions and policies

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