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**“The parts and the whole”: Unbundling and re-bundling
institutional systems and their effect on economic development**

Eric ROUGIER

*GREThA, CNRS, UMR 5113
University of Bordeaux
eric.rougier@u-bordeaux.fr*

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GREThA UMR CNRS 5113
Université de Bordeaux
Avenue Léon Duguit - 33608 PESSAC - FRANCE
Tel : +33 (0)5.56.84.25.75 - Fax : +33 (0)5.56.84.86.47 - www.gretha.fr

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Abstract

This paper surveys the growing empirical neo-institutional literature dealing with economic development and shows that it has essentially developed a one-dimensional perspective on institutions and their effect on economic development that has overlooked the fact that economic effects of institutions actually tend to cluster. The paper introduces an original framework to analyze institutional systems and the clustered effect of institutions. Drawing on this framework and on recent empirical studies having attempted to unbundle or re-bundle institutional systems along these lines, it is argued that understanding how institutions cluster their impact on economic outcomes imposes to give more attention to institutional systems, notably by (1) unbundling the specific economic effects of specialized institutions from those of such general purpose institutions as rule of law or property right enforcement, and by (2) re-bundling these effects so that de jure and de facto complementarities and hierarchies can be identified between specialized and general purpose institutions.

Keywords: Economic institutions; Political institutions; Economic development; Institutional complementarities; Institutional hierarchies; Institutional systems; Institutional clusters

« Les parties et le tout » : Décomposer et recomposer les systèmes institutionnels et leurs effets sur le développement économique

Résumé

Cet article présente la littérature empirique se consacrant aux effets des institutions sur le développement économique et montre qu'elle s'est propagée en adoptant une perspective unidimensionnelle qui occulte le fait que les institutions sont spécialisées et que leurs effets économiques sont nécessairement joints. L'article introduit ensuite un cadre original d'analyse des systèmes institutionnels, puis, en se basant sur la littérature empirique la plus récente, explique que comprendre comment les institutions associent leurs effets sur le développement économique exige (1) de décomposer les systèmes institutionnels en séparant les effets des institutions spécialisées des institutions génériques, et (2) de recomposer ces systèmes en identifiant les hiérarchies ainsi que les complémentarités de jure et de facto entre ces institutions génériques et spécialisées.

Mots-clés: institutions, développement, complémentarités institutionnelles

JEL: O17; P51; K11; K31

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1. Introduction

The last two decades have witnessed the multiplication of macro-empirical analyses showing that past and current differences in the quality of institutions robustly explain current differences in economic development. As a general rule, macro-empirical studies share a common definition of what are institutions, as they all refer to North's (1990, 2005) definition of institutions as humanly created devices describing the rules of the game that constraint human interaction. Yet, they paradoxically have tended to overlook a crucial point that was central to early institutionalist: institutions tend to cluster their influence over microeconomic actions and the ensuing macroeconomic outcomes. Since most institutions are specialized, their effect on microeconomic choices may cluster with other specialized institutions' own effect. The aim of this paper is not to systematically survey this plethora literature¹, but, instead, to focus on this crucial aspect generally overlooked by existing empirical studies and that just starts to be addressed by the most recent works.

Any economy, whatever is its level of economic development, is supported by a system of general and sectoral institutions organizing production, exchange and income distribution. An institutional system therefore consists in a set of interrelated institutions defining the symmetric set of interrelated incentives faced by individual or collective behavior. Institutional systems can be typified by the form taken by its institutions and, more importantly, by their pattern of interaction within and across different socioeconomic sectors, with this interaction possibly producing cumulative efficiency, in case of institutional complementarities, or inconsistency, in the case of institutional trade-offs. As pointed out by Bardhan (1989, 2005) and Pande and Udry (2005), microeconomic analyses of developing countries' institutions have been more conscious than the macroeconomic ones of the specialization of institutions and norms and of the interaction of the specialized incentives they deliver to individuals or to groups. They have also naturally acknowledged the diversity of the shapes taken by these specialized institutions across different national or even regional settings. As for macro-empirical studies, they have focused on separate dimensions of institutional performance, and tended to reduce institutions to their general function, therefore overlooking the huge variations of forms across countries (Rodrik, 2003; 2008b). This survey of the empirical neo-institutional literature shows that, by adopting this dominant one-dimensional approach, scholars have consistently disregarded the systemic nature of institutions and the fact that specialized institutions may have complementary or contradictory economic effects. Since the impact of such a very generic institutional indicator as property rights or constraint on executive is strengthened by the existence of other complementary institutions, this neglect of the systemic effects of institutions could have led to the overestimation of the economic effects of the most commonly used general purpose institutions. Equally, failing to address the high dimensionality featured by institutional systems certainly raises identification problems, the interpretation of the estimated effect of such generic institutional attainments as the rule of law being made problematic by the high uncertainty about effective channels through which this action operates.

This survey of the new-institutional empirical literature addressing development issues is therefore built upon three main arguments. First, since, the high dimensionality of institutional systems is hardly assessed by existing definitions and quantitative measurements of institutions, the bulk of existing analyses have singled out a limited variety of generic one-dimensional institutions and overlooked the interdependent nature of the sector-specialized ones. Second, since the quality of institutional governance cannot be reduced to the working of such generic institutions as property rights or basic human rights, institutional systems should be analyzed as articulated sets of generic and specialized institutions. Developing economies might accordingly be analyzed as institutional systems of complementary and hierarchized sectoral institutions, with these economies' performance relying on the internal consistency of these systems. Third, the very nature of institutional reforms in developing countries, implying a high degree of hybridization and incremental tinkering, must be accounted for if the internal inconsistencies of most developing countries 'institutional sets are to be fully understood. From these three arguments, the paper infers that

delving into institutional systems would require to (1) unbundle the specific economic effects of specialized institutions underlying the estimated effect of overall institutional attainments such as rule of law or property right enforcement, and to (2) re-bundle these effects by assessing the varieties of cumulative effects of observable sets of specialized institutions and measurement caveats. The survey argues that institutional hierarchies and institutional complementarities may help reaching this goal and proposes a general framework of institutional systems' empirical analysis.

The next Section 2 points to the measurement and identification issues raised by the high dimensionality of institutional systems. Section 3 proposes a general framework for analyzing clustered effects of institutions. We then proceed by reviewing the empirical studies having attempted to re-bundle institutional systems in Section 4, before concluding in Section 5.

2. Highly-dimensional institutional systems and their impact on economic development: Measurement and identification issues

Since the early 1990s, the concept of institution has tended to be used as a very generic term encompassing a broad array of policy tools, formal rules or governance outcomes of various kinds. A great deal of confusion has in fact been introduced by the empirical analysis of the however clearly defined concept of institution (North, 1990). As underlined by Persson (2005), the institutional literature dealing with economic development has tended to put identical institutional contents under different labels, and the same label upon different institutional objects². Policies and institutions have accordingly been used as very close notions, with the former being frequently defined sufficiently broadly to encompass such different things as constitutional rules, bureaucratic efficiency and regulation policies. In this section, we argue that this terminological confusion is a symptom of the serious measurement and identification issues caused to the high dimensionality of institutional systems, and that identification problems have certainly been aggravated by the intensive use of a restricted set of historical variables as instruments for a huge variety of current institutions.

2.1 Identification and measurement issues

The empirical identification of the effect of institutions on economic development evidence produced by the bulk of existing macro-econometric studies is fuzzy because it is not clear which perimeter and what dimensions of the institutional systems are really involved in what is effectively measured. A great deal of definitional confusion has certainly stemmed from the necessity to measure institutions and rules so that these measurements can be comparable across countries. Under the pressure of the policy-makers and donors' growing need of quantitative information about governance, a variety of score-like quantitative measures was therefore produced by various public and private organizations in order to assess developing countries' reform efforts (Arndt and Oman, 2006; Davies et al., 2012). It is well known that defining and measuring indicators implies both knowledge and governance stakes (Porter, 1995; Jerven, 2013). In the specific case of institutional indicators, however, the latter stake has prevailed over the former one. The basic idea that effectiveness of the various institutional forms to be observed across countries can be reduced to a notion of distance to the best practice's frontier has become salient from the mid-1990s onwards. This benchmark approach is based on the conjecture that non-measurable institutional objects (laws, norms, cultural constraints) can be proxied by measurable attainments taking the form of indicators enabling to rank countries from the worst to the best performer. The strong appeal of this distance-to-the-frontier approach for international organizations and developing countries' policymakers has mainly stemmed from its simplicity and its capacity to be communicated and translated into reform objectives (Høyland et al., 2012). Political mobilization has been stimulated by such rankings, with « top reformers » being pointed as examples for other countries by international organizations or

economic advisors, and developing countries policy makers elaborating “rank-seeking strategies” (Davis *et al.*, 2013) by implementing reforms with very weak effectiveness and systemic consistency³. Many developing countries’ governments have felt themselves obliged to adopt international standards of institutional reforms, simply because they would not otherwise be given financial help (Andrews, 2013). Thus, governments have started implementing reforms like privatization, fiscal rules or meritocratic and performance-based administration in order to improve their country’s governance scores and raise financial support, but these reforms are seldom completed, with detrimental effects on the institutional system internal consistency. Accordingly, not only scores cannot contribute to describing the very nature of institutions underlying this perceived quality, but they also may be seriously misleading since institutional systems can be apparently reformed while actually remaining highly dysfunctional⁴.

As for the knowledge stake, more central to our argument here, it has been undermined by three major weaknesses common to the most currently used institutional datasets.

First, *allegedly multidimensional datasets actually lack of dimensionality*. Insofar as economic activity requires a large and highly interacting set of public policies, services and rules constituting inputs into the production process, measuring and comparing these sets across countries requires that a high-dimensionality information set-up is adopted (Hausmann, 2008). Such organizations as Political Risk Service (PRS), Business Environment Risk Intelligence (BERI), World Economic Forum (WEF), Fraser Institute (FI), World Governance Indicators (WGI) or Heritage Foundation generally claim that their indexes and sub-indexes are able to address the multidimensionality consubstantial to institutional frameworks. Arndt and Oman (2006), Martin and Petra (2011) and Laura and Knack (2011) have shown, however, that these sub-indexes are in fact ambiguous because multifaceted and, for some of them, overlapping. Accordingly, various one-dimensional World Bank Governance Indicators or ICGR scores actually exhibit strong cross-correlations. In presence of overlaps, Ravallion (2012) argues, “mashup composite indices” remain appealing because they parsimoniously collapse multiple dimensions into one or a few ones, therefore reducing concerns about measurement errors in the component series and colinearity among regressors in econometric tests⁵. The already limited dimensionality of institutional indicators is thus shrunken into a small number of synthetic scores merely computed by averaging the whole set of variables, without much consideration of the possible trade-off or synergies between the singular effects of the various institutional dimensions composing the index (Ravallion, 2012). The apparent multidimensionality of some of the most currently used datasets therefore hides the dramatic lack of differentiation between the different dimensions covered by the indicators. Incidentally, this reduction process has finally erased the specificity of each sub-component and undermined the precision of the measured effect. The researcher using multidimensional institutional indicators therefore faces a crucial trade-off. On the one hand, they are too highly correlated to be associated in a single regression framework. On the other hand, they lose their multidimensionality by being averaged into one-dimensional indexes. Accordingly, large institutional datasets mixing up systemic properties with more specific institutions and policy indicators generally fail to map “real world” highly-dimensional institutional systems encompassing a huge variety of specialized agencies and rules (Hausmann, 2008).

Second, *although they apparently yield unambiguous country rankings, the meaning of these indices is made unclear by the lack of theoretical foundations*. In the absence of any underlying theory, these multidimensional dataset neither inform about what exactly causes institutional attainments, nor enable to identify which specific rule or governance mechanism should be adjusted to improve institutional performance. As stated by Hausmann (2008: 11), “most likely, the requisite policy actions constitute an even longer list, along with its complicated sets of interactions”. Furthermore, observing and measuring institutional attainments without considering the latent sets of rules underlying them has blurred our understanding of the channels through which improved institutions effectively spur economic development. Voigt (2013) has recently criticized the tendency to assess institutional quality by very generic attainments on the ground that it blurs the understanding of the working of institutions. Since correctly measuring institutions requires that the gap between the kind of behavior expected from one institution and that actually observed is

correctly gauged, the institution(s) whose effects the researcher is interested in should be clearly identifiable. Moreover, attainments like “democracy” or the “rule of law” can’t be considered as being produced by single institutions but instead by a whole system of institutions (Voigt, 2013). Even though aggregating all these interacting single institutions into a comprehensive indicator is appealing for researchers, the fundamental objective of explaining what mechanisms really drive attainments requires that these single institutions can be correctly identified and measured, and that their single impact on the economy can be assessed. By its very nature, the one-dimensional approach to institutions can neither improve our understanding of these interactions between specialized institutions, nor provide policymakers with useful hints to improve the system regulation.

A third criticism is that mostly used *index scores are highly uncertain and often self-referring*. According to Høyland et al. (2012: 3), such index scores as the World Bank's Doing Business Index, the Freedom House's Freedom in the World and the United Nations' Human Development Index, are highly uncertain because their computation fundamentally relies on observable attainment indicators that are, at the best, *“uncertain signals of the underlying (institutional) quality that they all are partial observations of”*. The great deal of uncertainty attached to their construction certainly undermines the econometric analyses using them as explaining variables (Treier and Jackman, 2008). The subjective nature of many institutional attainment measures based on survey responses of local business holders, foreign investors or other experts also makes institutional indicators highly self-referring. Since information about institutional quality is often drawn from subjective evaluations by experts and subsequently translated into scores, what is actually measured in these data is the perception of the political, administrative and economic governance capacity to raise the outcomes that are valued by the experts or businessmen who answer to the survey, with this perception being potentially polluted by their own objectives⁶. If such subjective assessments as the “rule of law” are influenced by the respondent perception of the country’s global investment performance, then the estimated investment effect of the subjective score of rule of law might be overvalued by a measurement bias (Voigt, 2013).

2.2 Endogeneity issues

Part of the conceptual confusion described in this section has certainly stemmed from the fact that institutions are theoretically simultaneously cause and consequence of development levels. There is a high degree of correlation between some forms of institutional attainments and economic development, with causality certainly running in both directions. The positive effect of institutions on GDP per capita growth may well be driven by the fact that many of the property rights reforms implemented over the last decade have been inspired or even imposed to indebted countries by international financial organizations. As pointed out by Voigt and Gutmann (2013, 69), *“if the poorest countries or those with the worst prospects regarding growth have been encouraged most to reform their property rights institutions, then being poor might be the cause for reforms and reversed causality a serious problem”*.

Because of the lack of time variation in institutional data, endogeneity issues have essentially been addressed by using external historical instruments of current institutions, with the most commonly used being the fraction of the population speaking English (Hall and Jones, 1999), the logarithm of settlers’ mortality in the early 19th century and the population in 1500 (Acemoglu et al., 2001, 2002) and the legal origin of current legislations (La Porta et al., 1998, 1999; Glaeser and Shleifer, 2002; Djankov et al., 2002, 2003; Glaeser et al., 2004; Acemoglu and Johnson, 2005). The use of legal origin has become pervasive in empirical analyses of economic development because it correlates with a broad set of economic, institutional, or political outcomes and because alternative instruments for current institutions are scarce and coarse (Pande and Udry, 2005). Incidentally, legal origin has provided researchers with an easy but simplistic characterisation of the institutional models’ variety across developing economies. A limited set of historical instruments, allegedly predicting the quality of current institutional governance⁷, have therefore been (over)used to

instrument a wide array of institutional dimensions, thereby certainly further increasing the one-dimensionality bias of macro-empirical studies

Table 1. Factors and loadings for the standard instruments (N=56)

Variable	Factor1	Factor2	Factor3	Factor4
Log of settler’s mortality	-.3200	.6937	-.2070	-.0023
Population in 1400	.2704	.0808	.3067	.0332
European descent	-.0632	-.7361	-.2929	.0119
State antiquity	.1821	.1128	.6755	-.0029
Ethnic fractionalization	-.0621	.4997	-.2877	.0194
British legal origin	.9093	.0619	-.2003	.0126
French legal origin	-.8997	-.1198	.1405	.0208
% of variance explained	.5264	.3723	.2334	.0006

Note: As a general rule of thumb, loadings should be .7 or higher to confirm that independent variables identified a priori are represented by a particular factor. The threshold can be reduced to .4 for exploratory factor analysis.

A simple factor analysis of the most currently used historical instruments reviewed by Pande and Udry (2005) – the log of settler’s mortality, the French and British legal origins, the log of the population in 1400, the State antiquity, the ethnic and linguistic fractionalization and the proportion of population with European descent – unveils three latent dimensions of differentiation. Table 1 shows that the first latent dimension, exhibiting the highest loadings (52% of the overall variance), is explained by the legal origins and accounts for the differences between civil law and common law legal systems. The second latent dimension, explaining 33% of the overall variance, reflects the cross-country differences in settlers’ mortality, ethnic and linguistic fractionalization and the proportion of population with European descent. This latent factor actually accounts for the extractive or inclusive nature of the institutions that were set up by colonizers and settlers during the 19th century, with these past institutions having lingering effects on the types of institutions that were to be adopted later. The third factor, explaining 22% of the overall variation, is explained by long term country characteristics such as the state antiquity and the log of population in 1400. They essentially inform about the antiquity of political structures, with antiquity tending to bring political stability, even though as the result of the absence of democracy. Although there are three different lines of country’s differentiation with respect to their institutional quality, these three dimensions can’t be considered as being strictly orthogonal as shown by the high magnitude of the different variables on each one of the three factors.

In a second step, institutional indicators reflecting four distinct dimensions of institutional governance, *i.e.* the rule of law (rule of law), the property right protection (expropriation risk), the quality of microeconomic market regulation (ICRG index of regulation quality) and democracy (Polity IV constraints on executives) have been mapped against their most currently used instruments just described above. Our main objective is to check the pattern of instruments’ matching with the most traditional dimensions of institutional characterization. Table 2 shows that bringing these institutional outcomes into the factor analysis, jointly with our five instruments, produces three interesting results. First, three out of the four institutional outcome indicators, *i.e.* the rule of law, the expropriation risks and the quality of regulation are correlated with the first component, loaded by settlers’ mortality, ethnic fractionalization and population with European descent. Second, and surprisingly, the legal origin dimension is not correlated to any institutional outcome, even the quality of regulation and licence restrictions traditionally reflecting the differences between civil and common laws. Third, the long-term features are heavily correlated with the fourth indicator, constraints on executive accounting for the democratic nature of political institutions.

Table 2. Factors and loadings for standard instruments and institutional indicators (N= 56)

Variable	Factor1	Factor2	Factor3	Factor4
Log of settler’s mortality	-.7363	.2319	-.1871	-.3352
Population in 1400	.0414	.2845	.2186	.3153
European descent	.4878	-.5210	-.3359	-.0107
State antiquity	-.0641	.1727	.5185	.5151
Ethnic fractionalization	-.3843	.2635	-.3483	-.1527
British legal origin	.5661	.7145	.0616	-.1814
French legal origin	-.4856	-.7509	-.0756	.1955
Regulatory quality	.8466	-.2285	.0934	-.2806
Rule of law	.8786	-.1768	.2173	-.0941
Expropriation risk	.1980	.2913	-.6588	.3660
Autocracy	-.5857	-.0808	.5033	-.2817
% of variance explained	.4613	.2408	.1837	.1198

Note: As a general rule of thumb, loadings should be .7 or higher to confirm that independent variables identified a priori are represented by a particular factor. The threshold can be reduced to .4 for exploratory factor analysis.

This simple statistical exercise therefore points to the absence of dimensionality of some of the most widely used instruments since three of the four distinct dimensions of institutional governance actually match with the same dimension of instruments. Settlers’ mortality and ethnic fractionalization nevertheless show significant correlation with each one of the three retained factors, therefore suggesting that they may be able to predict current institutional quality, whatever its dimension. This generality is likely to reduce the dimensionality that econometric estimations can actually handle. Last but not least, the legal origin, extensively used by La Porta et al. (1997, 1998, 1999, 2008) during the last 15 years to instrument all sorts of sectoral and market regulations (finance, goods and labour) does not seem to be good predictors of our regulatory variables.

To sum up, crucial knowledge issues are raised by the excessive focus on outcomes of the lack of dimensionality of the most current macro-empirical approaches. As claimed by Voigt (2013), in order to account for the variety of possibly relevant institutions, one must avoid dumping them all together in a sort of “mixed bag” approach, but try, instead, to articulate their joint effects. Existing empirical studies have tended to overuse institutional datasets ranking developing countries according to a single institutional dimension, or to a multi-dimensional scalar synthesizing various dimensions of the institutional system, thereby neglecting possible complementarities in the economic impact of the different sectors constitutive of the institutional system. Because it hides the high dimensionality of institutional systems bundling sector-specific institutions interacting one with another, simply estimating the economic impact of one-dimensional institutional attainments is clearly not the best method to analyze how institutions condition economic development in a general equilibrium setting (Hausmann, 2008; Rodriguez, 2007). Bundles of institutions therefore need to be more closely untied, so that, in the next stage, the economic impact of each individual institution can be assessed at system level. Put differently, the expected economic impact of each institution might be assessed in interaction with that of the other individual complementary institutions composing the system.

Two embedded questions arise at this stage: What is the composition of the institutional bundles that are latent to such institutional outcomes as rule of law or property right protection, and that are conducive, in turn, to higher investment and growth? How do these elementary institutions combine their economic effect? Whereas the first question refers to the necessity of unbundling institutional systems by a clear identification of all dimensions of institutions (Section 3), addressing

the second question imposes to re-build systems by carefully assessing the articulations between all these dimensions of institutions (Sections 4 and 5).

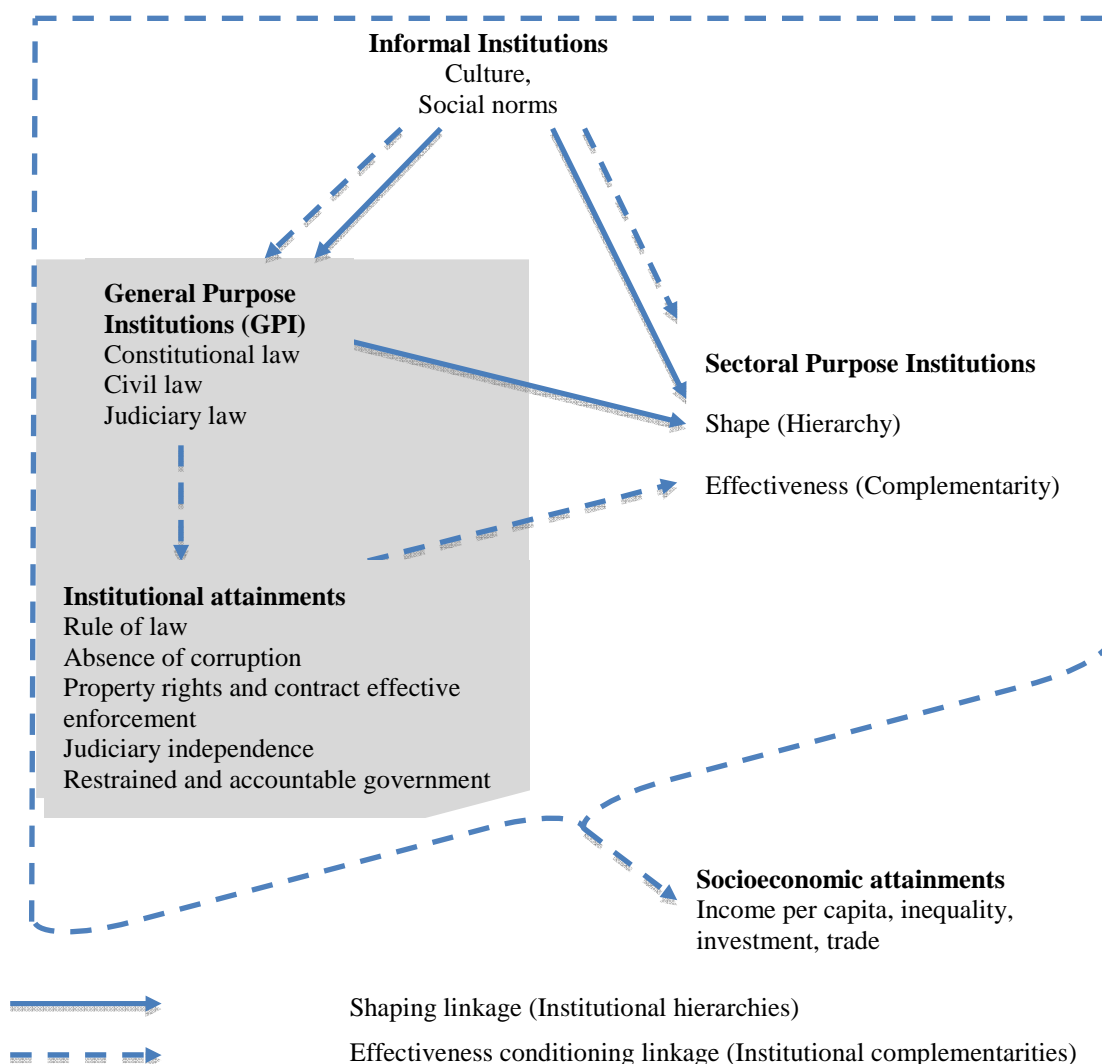
3. Unbundling and re-bundling highly dimensional institutional systems: A general framework for analyzing hierarchies and complementarities

3.1. A general framework

Solving the identification problems described in the previous section would require the different parts to be constitutive of the whole institutional system to be clearly isolated and described. Surprisingly, there have been few theoretical or empirical attempts at disentangling the bundles of institutional dimensions and of their aggregated economic effect at the macroeconomic level. At a later stage, these parts must be re-bundled by identifying how these specialized and general purpose institutions jointly impact aggregate socioeconomic outcomes. The framework represented by Figure 1 may help to reach these goals by introducing a useful differentiation between general and sectoral purpose institutions and by presenting possible types of articulations between these various types of institutions.

Our framework introduces two concepts, the General Purpose Institutions (GPI) and the Sectoral Purpose institutions (SPI). The former concept is clearly drawn from the General Purpose Technology (GPT) concept. GPT has been defined as having three characteristics: 1) pervasiveness, with the GPT spreading to most sectors; 2) improvement, with the GPT improving its efficiency over time and, hence, keeping lowering the costs of its users; and 3) innovation spawning, with the GPT making it easier to invent and produce new products or processes (Bresnahan and Trajtenberg, 1996; Jovanovic and Rousseau, 2009). Symmetrically, such rules as property rights and contract law may be qualified of GPIs. First, their applications are pervasive across all sectors of the economy; second, both their enforcement and efficiency increase with the existence of complementary institutions and of learning effects, with these network externalities generating path dependency; and third, they, at the same time, ease the establishment and condition the shape of other more specialized sectoral complementary institutions. Three GPI subsets define the overall framework. Constitutional law contain the rules governing the working of government (Ex. constraints on executive; transparency rules; federalism; political regime); civil law states the rules governing government’s relation to economic actors (Ex.: property rights) and the rules governing relations among economic actors (Ex. contract law); judiciary law defines how law is applied, understood and modified (Ex. Laws establishing an equal access to a fair and independent justice). Since legal systems are path-dependent historical productions, with strong cultural roots, GPIs generally show cross-country heterogeneity in their shape. The effectiveness of these three GPI subsets is essentially gauged by subjective evaluation of attainments like rule of law, absence of corruption, degree of property rights enforcement or of contract enforcement, judiciary independence or democracy. Such *de facto* subjective attainment scores are very often used by empirical analyses for the *de jure* institutions conditioning them.

Figure 1. The whole institutional system “unbundled”



Informal institutions also play an active role since they can either substitute to or complement the action of these formal GPI. Fafchamps (2004), among other microeconomic analyses, has shown that, in an environment featuring judiciary weakness, pervasive opportunism and distrust, African merchants and entrepreneurs tend to substitute informal rules, based on social or ethnic networks, to the *de facto* formal centralized rules. Conversely, formal and informal rules may be complementary, especially when cultural or social norms bolster formal rules enforcement (North, 1990; Aoki, 2001). These two sets of rules show high degrees of complementarities and strongly frame other sectoral purpose specialized institutions’ effectiveness.

SPIs have been typified with respect to their function within the overall system. Rodrik (2000) was the first to propose a functionalist typology in four classes of institutions: the market-creating institutions (for property rights and contract enforcement); the market-regulating institutions (for externalities, economies of scale, and information about companies); the market-stabilizing institutions (for monetary and fiscal management); and the market-legitimizing institutions (for social protection and insurance)⁸. In our framework, SPIs therefore correspond to the Rodrik’s market-regulating and market-legitimizing institutional types. The quality of sectoral governance has also been measured and contrasted across countries for the finance sector (La Porta et al., 1998, Beck et al., 2003), the product market (Djankov et al., 2002) and the labor market (Botero et al., 2004). These

studies notably show that some regulations, *i.e.* those more inspired by common law systems, generally lead to higher market performance than others, more inspired by civil law systems. But their approach has remained one-dimensional because they generally measure institutional impacts on economic outcomes by considering each sector in isolation from the others.

SPIs thus include regulatory sectoral laws, *i.e.*, the laws governing the regulation of competition and entry, of labor and capital markets and of public utilities and public services provision and access. They also encompass welfare institutions governing redistribution like fiscal rules, social protection rules (Ex. Rights to social protection) or public goods provision and access rules (Ex. educational access by age, sex). High GPI attainments obviously increase the effectiveness of SPI governing labour, capital or manufacturing and agricultural goods markets.

Therefore, notable efforts have been done to start unbundling subsets of specific institutions along different lines of differentiation. Adding new and original lines may nonetheless be difficult since new-institutional theory probably cannot help much more. Understanding how these subsets of specific institutions interact should nonetheless benefit from more attention in the future.

Understanding the behavior of the actors involved in a specific interaction situation requires the interplay of all potentially relevant to be properly identified (Voigt, 2013). Two main kinds of articulation (institutional hierarchies and complementarities) along which institutional systems can be re-bundled are overviewed and discussed.

3.2. Institutional hierarchies

Two hierarchical articulations can be described as being central to the working of institutional systems. The first one goes from the informal norms, like cultural or social norms, to the formal institutions. The simplest way to draw a distinction between formal and informal institution consists in defining the former as being endorsed by the state whereas the latter are not. Informal norms based on social or religious cultures are certainly a fundamental source of influence over individual behavior, either directly, or through their long-term influence on the shape and efficiency of formal institutions (North, 1990; Eggerston, 1996; Roland, 2004). If formal property right enforcement is certainly fundamental for all economic outcomes, Acemoglu and Johnson (2005) argue, contracting institutions can take various forms in order to effectively secure transactions, especially in economies with low degrees of formal enforcement⁹. Securing transactions on African markets, for example, requires that informal norms of contracting based on common beliefs shared by a community, can substitute for the absence of formal rules or for deficient enforcement of them (Fafchamps, 2004)¹⁰. Although informal institutions tend to substitute to formal ones, when the latter are not correctly enforced, these two enforcement mechanisms can also be complement¹¹. According to North (1990), formal rules are more widely accepted and enforced when they are compatible with the values shared by a population. Analyzing legal transplants in transition countries, Berkowitz et al. (2003) have shown, for example, that the efficiency of formal rules is conditioned by the familiarity of the population with their underlying concepts and values. But it is also likely that formal and informal institutions are simultaneously substitute and complement. Dhillon and Rigolini (2011) have recently demonstrated that, whereas high levels of judicial efficiency decrease consumers' incentives to connect in informal networks, therefore substituting a formal to an informal mechanism of transaction cost reduction, higher consumers' connectedness tends, in turn, to improve judicial efficiency. Thus, the relationship between formal and informal institutions is not straightforward, its nature being conditional both on the degree of enforcement of the former and on the level of congruence between the formal and informal norms of behavior.

As for the second hierarchical articulation, it goes from the political to the economic institutions. As argued by Williamson (2000), Roland (2004) or Evans (2004), political institutions are typically slow-moving rules, just like cultural norms, that simultaneously condition the shape and effectiveness of economic rules. Political institutions are what law scholars have called secondary rules, those influencing the formation of other institutions, called primary rules, that directly

influence the behavior of agents in a society (Hart, 1994; Davis, 2010). Because they force the state to credibly commit to respect private property rights and contracts and since they define the setting in which primary rules are designed, decided and enforced, political institutions, are typically secondary rules. Acemoglu et al. (2005) contend that not only political institutions do define the constraints limiting the use of political power, but they also condition the distribution of resources (and rents) within the economy, thereby determining which group holds the *de jure* political power in a given society. Hence, political institutions play a crucial part in the institutional system, and any political institution change may also modify the distribution of economic resources as well as the nature future economic institutions. Acemoglu and Robinson (2012) have provided various historical illustrations illustrating how the unequal distribution of *de facto* economic power combined with extractive *de jure* economic and political institutions can lead to the persistence of socially inefficient economic institutions. The factual enforcement of political institutions is often extremely precarious. Voigt (2013) recalls that there is no external mechanism able to enforce formal constitutional constraints against the government whereas, on the contrary, noncompliance with economic institutions can be sanctioned via political institutions, and noncompliance by members of the administration with administrative law can be challenged via administrative courts¹². As a consequence, political institutions have been used as instruments for economic institutions because they are supposed to be independent from economic outcomes and condition economic institutions (Persson, 2003, 2005; Eicher and Leuckert, 2009; Eicher and Schreiber, 2010; Flachaire et al., 2011).

3.3. Institutional complementarities

According to Pryor (2006), there is no general theory of institutional complementarity for developing economies. Yet, the emergence of such a theory may be based on a series of works that have not been related so far. On the one hand, New-Institutional Economics has implicitly envisaged institutional complementarities by considering developing economies as institutional systems composed of specialized agents and organizations whose actions are determined by overlapping layers of formal and informal institutions socially designed to reach specific goals (North, 1990, North, 2005), with the most common of which pertaining to individual property rights enforcement, transaction costs and uncertainty limitation and organizational efficiency promotion. On the other hand, political economy scholars have explicitly based their comparative analysis of socioeconomic systems on the explicit definition of institutional complementarities as the mechanism of functional interdependence by which the specific rules or regulation governing a certain domain affect the outcomes or utility of the whole system (Deeg and Jackson, 2006). More specifically, two institutions are considered as complementary if the presence/efficiency of one increases the returns/efficiency of the other (Hall and Soskice 2001: 17)¹³. Complementarity is thus a mechanism of “reciprocal reinforcement” by which “the existence of one institution provokes that of another, which in turn strengthens the first, and so on” (Crouch et al. 2005: 362)¹⁴. The particular type of coordination in one sphere of the economy is assumed to develop complementary practices in other spheres as well, with institutional reform in one sector tending to snowball into changes in other sectors (Hall and Soskice, 2001)¹⁵.

Studying developing countries’ institutional systems would, therefore, entail addressing mechanisms of systemic causation. Describing clusters of articulated institutions would inform about the degree of internal consistency and, possibly, the efficiency of the whole system. In the standard one-dimensional causation mechanism, isolated characteristics in one institutional domain determine specific outcomes in that and the other domains. In the systematic causation mechanism, it is the clustering of institutions of the different parts of the whole system that generates whole system performance¹⁶. Taken together, the institutions or regulations that are complementary across the different domains of the economic system are expected to impact choices and outcomes in a similar direction. For instance, flexible labor markets allocate labor more efficiently when they are articulated with an educative system delivering generic skill formation, while the existence of flexible

labor markets increases the relative returns to generic skills. Likewise, a deregulated labor market is more efficient in stimulating growth and productivity when it is associated with a deregulated product market and a market-based financing system (Hall and Soskice, 2001)¹⁷.

Institutional complementarities do not necessarily imply institutional isomorphism, though. Put differently, complementary institutions are not necessarily based on a common principle or logic (Aoki, 2001; Amable, 2003). Excessive focus on institutional isomorphism could even lead institutional comparative analysis to adopt ideal-typical or one-dimensional approaches, thereby neglecting the complex hybridized structure of most real world systems (Crouch et al. 2005). This is particularly true of developing countries. Again, Chinese TVEs provide a good illustration of economic organizations, and their related rules, inspired by a centralized and relation-based political culture (collective ownership), being successfully associated with free market institutions creating incentives to increase productivity (Qian, 2003). Such a heterodox hybridization of otherwise rival institutions has effectively produced the incentives ordinarily generated by private property rights, without the institutions of collective property being reformed until recent years¹⁸.

Overall, institutional complementarities, and possibly other weaker compatibilities, contribute to the resiliency of the core features of each institutional model. Institutional systems are characterized by more or less highly congruent institutions across their various constitutive domains, with this congruence achieving a certain degree of systemic consistency¹⁹, and therefore, of system resiliency. However, complementarities do not necessarily mean that the system of institutions works in an efficient way. Institutional persistence can be explained by current institutions' aggregate welfare effects, but institutions can also survive because they provide distributive benefits to the dominant sociopolitical coalitions. In this context, some core institutions can reinforce one another in ways that are supportive of crucial institutional aspects of the system. Here, complementarity can be seen as a negative process whereby the presence of an institution not only increases returns from (or efficiency of) the other (Hall and Soskice, 2001, 17) but also strengthens the sociopolitical support for the entire system, despite inefficiencies. As an illustration, Schneider (2009) has described how, in Latin America, hybrid systems mixing up features from CME and LME in an apparently inefficient fashion could indeed survive because they benefited from the support of strong coalitions. According to Schneider (2009), complementarities can thus stem from social learning, i.e. economic agents replicating successful modes of institutional governance from one sector to another. But they can also result from the influence of a sufficiently powerful group on the direction of institutional change²⁰. Resiliency would therefore be less the result of an internal equilibrium than of a mixed bag of politically defined institutional hierarchies whose prevalence is eventually reinforced by various internal (natural resource endowment, geography, past choices) and external (historical and contemporary external influences) factors.

3.4. Unbundling and re-bundling highly dimensional developing countries' institutional systems: de jure and de facto complementarities

From what precedes, it can be inferred that re-bundling developing countries' institutional systems requires a clearer understanding of how the various institutional dimensions and forms observed among developing countries actually combine together in a more or less complementary fashion. As explained in the previous sections, the institutional complementarity theory certainly constitutes a basis for our empirical research. However, the specificity of developing countries would suggest a more flexible notion of complementarity, one which is, in fact, closer to the idea of institutional coalescence, to be considered.

Table 3. *De facto* and *de jure* complementarities

	<i>De jure</i>	<i>De facto</i>
Progressive	Washington Consensus LME, CME	Experimentation Chinese market socialism
Regressive	Natural state	Reforms as signals / inconsistencies HME

Table 3 proposes a useful classification of real-world complementarities to be observable across developing countries which are often experiencing ad-hoc institutional transitions. We can call *de jure* complementarities the form of complementarities that can be expected on purely theoretical grounds or from the observation of an international benchmark. Flexible labour markets are for example supposed to be complementary to a competitive product market, since product market firms’ entry and exit will be facilitated by higher levels of labour and capital mobility. Liberal Market Economies (LMEs) and Coordinated Market Economies (CMEs) are two perfect illustrations of such ideal-typical models based on a priori institutional complementarities (Hall and Soskice, 2001; Amable, 2003). The liberalization and stabilization reforms constituting the Washington consensus were supposed to be strongly complementary on purely theoretical grounds (Williamson, 1989; Rodrik, 2008a, 2008b; Berr et al., 2009; Chang, 2011). Likewise, the imperative of growing in a globalised economy was assumed to bring about convergence of political economies towards a dominant model combining deregulated labour, capital and product markets and minimal government²¹. Since the functionalist approach considers that one given function should be assumed by only one type of best-fitted institutional form, whatever the national context, conforming all developing countries to the institutional frontier mix of institutions should be a priority goal and there would be no room for institutional experimentation of alternative complementarities²².

Yet, some developing countries have, during the last two decades, been busy introducing a high dose of experimentation into their institutional reform-making process (Ahrens and Jünemann, 2009), with their institutional sets being neither designed nor implemented to reproduce well identified *de jure* complementarities. This is not new, as underlined by Crouch et al. (2005), since developed countries’ complementarities were in fact often discovered, *ex post*, at a late stage of their institutional development. A similar observation was made for developing countries by Rodrik (2003; 2010) who spoke of institutional reforms as a process of experimentation of heterodox sets of institutions, with the term “heterodox” suggesting that the observed complementarities are not based on standard theoretical grounds. Country-case studies and historical records show that developing countries’ institutional systems articulate sectoral regulations that are the product of multi-layered processes of serendipity, incremental adjustment, politically-oriented reforms and globalization-led hybridization. A great deal of institutional experimentation has accordingly been observed since the 1980s, with many developing countries having retained high levels of state intervention, along with progressive and asymmetric market liberalization, while simultaneously improving the quality of macroeconomic policies (Rodrik, 2008a; 2008b). In their quantitative comparative analysis of developing countries’ institutional systems, Combarrous and Rougier (2015) confirm that a score of them can be typified as being highly hybrid, either by articulating idiosyncratic sectoral regulations or by mixing up orthodox and heterodox institutions, and not mere transplantations of western-style institutional benchmarks. Likewise, Johnson, Ostry and

Subramanian (2007) have identified, on a large sample of Asian, African and Latin American countries, renewed benchmarks of economic success which, although all exhibiting initially low institutional quality, have subsequently experienced their own virtuous circle of institutional improvements driven by good economic outcomes. Therefore, observed sectoral institutional arrangements should not be considered as being necessarily the most efficient, but, instead, as the result of a complex and open process of incremental and highly contingent institution building and formalization. Put differently, institutional complementarity is not the outcome of a centralized design but rather the result of a constant process of discovery and incremental adjustment that introduces a great deal of slackness in economic system design (Crouch et al, 2005: 363, 366). Rodrik (2010) even suggests that developing countries might make more intensive use of experimentation to test the institutions and regulations that best match their own national conditions.

From what precedes, we can define *de facto* complementarities as forms of institutional efficiency that do not have *a priori* theoretical justification. This form of complementarity may, instead, appear *ex post*, with institutions that were not initially supposed to be specifically complementary delivering unexpected positive effects. According to Rodrik (2008b), dealing with institutional design in economies afflicted by policy and market failures, would in fact require a second-best setting, in which no institutional form should be condemned as being unable to achieve desired ends. In a second-best setting, any specific institutional system managing to provide the correctly balanced mix of economic incentives and political support needed to ensure expansion of the economic system should therefore be seen as being favorable to economic development. The fundamentally dual nature of the Chinese institutional system since the early 1980s, described by Rodrik (2010, 41) as “a market system on top of a heavily regulated state sector”, or by Qian (2003) as a combination of pro-market (FDI incentives) and statist (collective property) institutions that simultaneously allowed for a massive rise in productive investment as well as the active support of local political elites, has finally generated strong *de facto* complementarities since it had positive development effects that could not be predicted by mainstream economic theory²³. Hence, even though their institutional components do not seem to be *de jure* complementary, certain, apparently inconsistent institutional systems, may well correspond to efficient institutional systems for the simple reason that they are conducive to socioeconomic development. In this case, we could talk of *de facto* complementary institutions, in the sense that they are not universally complementary, but locally, both in time and space²⁴.

The long-term persistence of a given institutional configuration does not imply that the system is necessarily *de jure* or *de facto* complementary and fully efficient, though. According to Boyer (2012) institutional persistence is either explained by the higher economic performance induced by the institutional complementarities, or by the sociopolitical process of institutional hierarchy by which an institutional configuration persists because it is favorable to the dominant sociopolitical groups, whatever is its economic efficiency. As shown in Combarrous and Rougier (2005), various poor countries actually show sets of strongly complementary institutions (predatory state, low protection and access to judiciary, education and political or economic organizations, constrained finance) that are very similar to the Natural States of North et al. (2009). While this highly complementary set of institutions succeeds in limiting the scope of socioeconomic violence, its effect on economic development is less positive, since it eventually tends to trap the economy into a persistent low- or intermediary-level equilibrium (North et al., 2009), with the Natural State political equilibrium remaining stable. Hence, a second adaptation of the institutional complementarities theory to the reality of developing countries would consist in opposing those forms of complementarity that are conducive to economic development and to high-level outcomes, and those that are akin to stable low-level institutional equilibria. As shown in Table 3, we propose to call the former progressive and the latter regressive complementarities.

Similarly, institutional inconsistencies, *i.e.* the persistence, in certain sectors, of institutions that are not complementary to the rest of the system, can be explained by the fact that those institutions have certain positive welfare effects, at least for some social groups. In non-democratic developing countries, even more than in mature democracies, sub-optimal institutional configurations may well

survive because they are culturally more acceptable, or because they provide distributive benefits to the dominant sociopolitical coalitions (Acemoglu and Robinson, 2006, 2012; Amable, 2003). In this context, some core institutions can reinforce one another in ways that are supportive of the political equilibrium of the system, even though those institutions are inefficient. Schneider (2009) has documented for example the survival, in Latin American Hierarchical Market Economies (HMEs), of an intermediary system combining features from CME and LME (e.g. externally liberalized economies and highly-regulated and protected labour markets) in an inefficient way, albeit benefiting from the support of strong coalitions. This combination of contradictory regulations actually introduced strong hierarchical links between and within firms, supported by Transnational Corporations and big domestic companies. As a consequence, increasing labour market dualism, supported by unionized TNCs and big national companies’ workers, generated high unemployment levels. *De facto* institutional complementarities, therefore, could well turn into a regressive process whereby the presence of one institution (labour market rigidity) reinforces the adverse economic effect of another one (external liberalization), whilst also strengthening sociopolitical support for the entire system, however socially suboptimal.

Hence, measuring the average level of economic and social performance of each model, or of each regularly observed institutional configuration, might inform on its complementary degree. Because observed sets of coexisting institutions may, in some cases, have enforced because they present elements of *de facto* complementarity, even though unconventional, , scholars should look at institutions that tend to be regularly observed together across developing countries rather than comparing national institutional configurations to international benchmarks based on *de jure* complementarities as is so often done. They nevertheless have to keep in mind that these observed institutional configurations may also be the result of a complex combination of domestic sources of influence, like historical critical junctures or political equilibrium, and of external influence, like colonization or structural adjustment, that led to the persistence of hybrid systems.

The next section will show that although they start to be addressed by empirical studies, the various forms of institutional linkages described in the present and previous sections have certainly been insufficiently addressed by the empirical literature, so far.

4. Re-bundling by identifying institutional hierarchies and complementarities: An overview of the empirical analyses

The empirical studies having attempted to re-bundle institutional systems by implicitly or explicitly addressed institutional complementarities, four different approaches have been implemented: (1) pooling a set of institutional indicators without underlying theoretical justification, (2) identifying latent factors underlying subsets of institutions, (3) re-bundling by identifying internally consistent systems of institutions and (4) re-bundling by testing dyadic institutional complementarities. The first two approaches are a-theoretical, with the former one being based on simplifying assumptions about institutional systems, and the latter being highly exploratory. On the other hand, the later two approaches hinge on strong theoretical grounds. Whereas the former approach has adopted the kind of second best set-up enabling to address non-conventional complementarities as they are observed in developing economies, the latter, while adopting a more modest partial equilibrium setting, tries to effectively measure both complementary effects and institutional hierarchies by various methods and provide important avenues for further research. These works are reported in the Table A1 in Appendix.

4.1. Exploratory approaches

A *first approach* has consisted in pooling separate indicators of regulations or institutions into a composite indicator (Braga de Macedo and Martins, 2008; Berr et al., 2009, Rice and Patrick, 2008). It

may not be a relevant approach insofar as it predetermines the mix of institutions and regulations that are supposed, *ex ante*, to be complementary in a typical first-best approach, thereby constraining the potential diversity across national models. Pryor (2010b), for example, has computed an original index quantifying the degree of capitalism for a cross-section of countries. He pre-defines capitalism by the articulation of three attributes: private and legally protected ownership of the means of production, competitive markets and direct economic freedom²⁵, and compute aggregate indicators of the degree of capitalism. These indicators do not really describe the very nature of the socioeconomic organization of each country but specify, instead, a distance to the US “purest” model of capitalism, without truly addressing capitalism diversity²⁶.

A *second approach* has consisted in identifying the latent complementarity logic underlying subsets of institutions by using factor analysis. According to Voigt (2013), measuring the effects of a notion that is broader than just one single institution, such as judicial independence or procedural formalism, requires assuming that this latent not directly observable notion can be figured out by factor analysis by which a set of variables are synthesized into a (lower) number of factor. The statistical association existing between the original variables and each factor is summed up by the factor loadings. Factor analysis translates the set of co-varying directly measurable variables into non-directly measurable latent factors, with the correlations between the variables subsumed into each factor being causally ascribed to one singular latent concept clearly distinct, since orthogonal, to the other factors. Two recent illustrations of this approach are Rosenthal and Voeten (2007), which uses factor analysis to identify the principal components of procedural formalism, and Blume and Voigt (2008) which uses factor analysis identify various dimensions of federalism and fiscal decentralization.

Several other works have more explicitly addressed the issue of institutional clustering by mobilizing multidimensional statistical methods. Meisel and Ould Aoudia (2008) have offered a rich categorisation with respect to original subjective ratings of various dimensions of institutions of developing countries, but they limit their approach to a principal components analysis. They show that developing countries are mainly differentiated according to their degrees of economic development and democracy, with government characteristics, such as elites giving priority to development, or rulers creating a common interest in development, being correlated to these two dimensions. Roland and Jellema (2009) have clustered various institutions for three domains (cultural, political and legal) so as to test the joint economic effect of various institutions. They test the GDP growth and income impacts of the different principal components identified for each domain at a preliminary stage. Even though they address the joint economic effect of clusters of institutions, they do not then proceed towards empirically assessing institutional complementarities, i.e. the way one institution, or institutional domain, may improve (or reduce) the other one’s efficiency. Although their papers’ title explicitly refers to clusters of institutions, Roland and Jellema (2009)’s approach actually consists in reducing the multi-dimensionality of each domain into a limited number of orthogonal synthetic indicators. Saddiqi and Ahmed (2013) also recently conducted a factor analysis to address the multidimensionality of a large set of commonly used institutional indicators. They find three robust factors governing respectively institutional and policy rents, political rents and the risk over transactions and physical and ownership integrity. They show that although the former one has a higher growth effect than the two latter ones for developing countries, the two latter have a complementary effect on growth for the whole sample.

Even though this approach undoubtedly helps re-bundling institutional sets, drawing on factor analysis to synthesize different interrelated variables into one indicator should be more based on theoretical than on mere statistical justifications. The two next approaches have tried to overcome this weakness by articulating sound theoretical foundations with statistical analysis.

4.2. Theory-based approach

A *Third approach*, fitted to addressing the systemic nature of institutions, has been implemented by the comparative politics literature that has, so far, limited its attention on OECD

countries’ institutional systems. Its approach consists in evaluating institutional complementarities, their changes and their “sustainability” to discuss the possible trajectories of socio-economic models. Each socio-economic system is a collection of complementary institutions in all the domains of the socioeconomic organization including labor market, education systems, competition, financial system, welfare system²⁷. As a consequence, no single institution can be considered to be efficient or inefficient in abstraction of the whole institutional system to which it takes part. Furthermore, any single institution is likely to affect any domain of the system through the channel of its complementarities with the other institutions. A localized change in a domain can alternatively have weak or strong impact on other domains of the socioeconomic organization according to the extent to what the changing institution bears connection to the whole system.

Rudra (2008) has studied clusters of social welfare institutions for a sample of 30 developing countries. Her primary goal is to assess whether developing countries’ welfare efforts tend to privilege commodification or decommodification. She finds three types of social welfare model on her sample: a first model, called productive welfare state, characterized by high levels of commodification, in which welfare efforts are geared towards promoting market development; a second model, labeled protective welfare state, in which highly decommodified welfare policies aim at protecting selected individuals from the market; and a third, intermediary, dual welfare state. Combarrous and Rougier (2015) use mixed factor analysis and clustering methods to identify clusters of specialized institutional arrangements for seven sectors (education, social protection, product market, labour market, finance, agriculture and environment) that are constitutive of capitalist economic systems in developed and developing countries. Their main objective consists in addressing *de facto* complementarities that they define as observed institutional congruence that appear to have been functional *ex post*. In particular, they accordingly identify hybrid institutional systems articulating idiosyncratic forms of sectoral regulations that deliver good economic development outcomes.

Pryor (2006, 2008, 2010a) tries to identify varieties of economic systems and their aggregate relationship with various outcomes like culture and polity. Pryor (2008: 548) claims that studying systemic causation imposes a focus shift from the relationship between individual variables or institutions to systems. He goes on criticizing the statistical methods used in analyzing lineal causation for their inability to address the issue of systemic causation, and ultimately argues for an empirical analysis that shows parallelism between systems in different domains. In Pryor (2006), clusters of economic institutions are identified using institutional and policy indicators of the product market, firms and production, labour, government and financial sectors, for a sample of 41 developing countries. Four types of economic systems are identified: Traditional, Labour-oriented, Business-oriented and Statist. These four models are distributed across the different world regions: most African countries have traditional systems; Latin-American countries tend to be characterized by labour-oriented systems; Asian economies are mainly business-oriented; and statist systems are to be predominantly found in Middle-East and North African countries. This study represents the first exploration of developing countries’ economic systems via various institutional and outcomes indicators. Yet, the scope of his work is limited by the small size of the country sample (41 countries), which notably excludes former socialist economies in transition to market, and by the method clustering together individual institutions and policies. Even though they tend to be highly conditioned by the prevalence of regional institutional patterns, Pryor’s types of economic systems do echo some of our own models in this book. However, since economic systems are characterized for the year 1990, key emerging countries have been either left untreated (China, Russia and all the countries in transition from socialism) or not robustly classified (India, Brazil), thereby limiting the coverage of the study to an arbitrary and limited set of countries.

The *Fourth approach* has consisted in testing the mutual effect of two separate institutions on various economic outcomes by estimating the coefficient of their interactive term. This approach is directly drawn from the institutional complementarities theory discussed above. It enables testing the likely non-linear impact of institutions inherent to high-dimensional systems, by checking if the economic effect of an institution A is modified by the presence or enforcement degree of an

institution B. Although various recent books have focused on complementarities in the context of developing countries, they have not proposed a statistical treatment of them. In their book on the long-term economic effect of institutions in developing countries, Acemoglu and Robinson (2012) oppose two complementary institutional dimensions, the political and economic ones. They show that only a combination of inclusive political and economic institutions enables countries to reach high levels of economic development in the long-run. Besley and Persson (2012) focus on two other complementary dimensions, showing that state capacities in both the legal and fiscal dimensions are necessary conditions for efficient development policies. Their analysis points to a crucial source of complementarity between these two forms of state capacity, each of these dimensions reinforcing the other, and they claim that this complementarity is a natural way to think about the clustering of institutions in developing countries. In standard fashion, however, they use proxies for both capacities, and test their assumption by cross-sectional econometrics. In their analysis of natural and open access states, North et al. (2009) argue that equal access to different types of public goods is a predominant characteristic of developed countries' open access orders. They show that equal access has generally been provided in a certain sequence: first, the rule of law, followed by mass education and infrastructure and, finally, equal participation in labour markets, including the provision of social insurance systems. Gollwitzer and Quintyn (2012) have provided an empirical test of this sequence by clustering certain institutions and examining their effect on economic outcomes. They divide these “stylized steps” into three sets of doorstep conditions corresponding successively to the rule of law for both the masses and the elites (Doorstep 1), the existence of perpetually lived organization, including the state (Doorstep 2), and consolidated political control of the military (Doorstep 3). The authors argue that meeting Doorstep 1 condition enables the other doorsteps to be met, with the three doorsteps interacting at various levels. There is, consequently, complementarity between these three dimensions of institutions. Even though they are concerned by complementarity issues, these studies essentially propose universal patterns of inclusive state creation. The diversity of institutional configurations across developing countries is not primarily addressed by these studies, the clustering of institutions being limited to political and socioeconomic organizations.

Bjornskov and Méon (2012) have provided empirical evidence of a hierarchical link between informal and formal institutions by showing that increased trust improves educational outcomes and legal and bureaucratic institutions, which in turn spurs economic development. Indeed, trust is the result of the interaction between culturally inherited values or perceptions and more formal institutions. However, culture may, in turn, be influenced by formal institutions, like democracy or property right enforcement which can durably increase trust within a society. Therefore, various instruments for culture have been tested to control for this likely endogeneity. Using a linguistic variable on pronoun drop as an instrument for their cultural variable, Licht et al. (2007) have shown that the most usual norms of governance, i.e. the rule of law, control of corruption and political accountability are significantly influenced by various cultural emphases on autonomy versus embeddedness, with a clear impact on economic outcomes. Using genetic data as instruments for culture, Gorodnichenko and Roland (2011) have also found a causal effect of individualism on income per worker and total factor productivity as well as on innovation. They have also found a two-way causal effect between culture and institutions, providing support for the argument argue that formal rule enforcement can end up influencing back culture and drive long-term cultural transformation in a society. Maystre et al. (2014) have gone a step further, explaining that economic outcomes, institutions and culture move simultaneously and bear multiple mutual linkages over the long run. This co-evolution process casts doubts over any quantitative approach based on cross-sections of countries in which no explicit account of the time dimension is made²⁸.

In line with this approach, various complementarities between institutions and regulation have been explored over the last decade, especially in the context of reforms for transition and developing countries. More specifically, Aghion et al. (2008) or Fiori et al. (2007) have evidenced the complementary effects of product market and labour regulations on growth and employment outcomes. The importance of complementarity has been also pointed out for trade openness and liberalization policies by Bokaly and Freund (2004) and Chang et al. (2005). But Voigt and Gutman (2013) is one of the first attempts at measuring the combined effect of two institutions: *De jure*

property rights and *de facto* judicial independence. They show that the growth effect of the former is magnified by higher levels of the latter. Similarly, Méon and Sekkat (2013) have investigated the separated and cumulative effects of formal and informal institutions on private investment. They show on a panel of countries that social trust and formal legal and institutional determinants of capital accumulation interact, with the two being substitutes, the marginal impact of formal legal institutions decreasing with trust, and vice versa. Trying to explain the Arab spring by the adverse effect of highly authoritarian-redistributive social contracts on structural transformation of Middle East and North African countries, Rougier (2014) estimates the combined impact of redistribution and democracy on structural change and shows that authoritarianism significantly reduces the positive impact of redistribution on export diversification and sophistication. Acemoglu, Robinson and Santos Villagran (2013) have shown that predatory informal institutions, like paramilitary in Latin America, have reinforced the efficiency and return, for the elites, of equally predatory formal political institutions. Equally, the capture, by the centralized elites, of local institutions can reinforce their control over political and economic resources at country level (Acemoglu, Reed and Robinson, 2013).

Table 4. Selection of institutional complementarities and their outcomes

	Labor	Social Welfare	Education	Bank and finance	Agriculture	Environment
Product market	Informal activities	Demand (China) Social dumping	Comparative Advantage	Labour and investment	Export vs Subsistence Struggle for land	Pollution and innovations Rents from Commodities
Labor		Decent labour, demand support	Skills upgrading	Remittances	Surplus transfer to industry	Employment creation via innovation
Social welfare			Fiscal policy	Pension funds	Informal protections	Reduction of inequalities
Education				Microcredit	Productivity, sustainability	Sustainable consumption
Bank and finance					Microcredit	Clean development
Agriculture						Pollution deforestation

Here also, much would remain to be done since many combinations of complementary institutional effects have not been tested so far. Table 4 shows a matrix of variety of possible sectoral purpose institutions’ complementary effects on selected outcome variables that could be tested by this approach. For example, the first interior cell of the table of labor and product market regulations

on informal activities. This table shows that much research remains to be done on the combined impact of sectoral institutions or regulations on various dimensions of economic development. Even though promising, this approach will nevertheless be limited in the longer run by its focus on partial complementarities (one to one) and the difficulty of interpreting multiplicative terms when the number of components is higher than two. General equilibrium approaches, accounting for second-best mechanisms, would therefore have to be invented.

5. Conclusion

Composite institutional indices are supposed to synthesize multidimensional sets of specialized institutions likely having equally specialized economic impacts. By simply juxtaposing such one-dimensional effects, the bulk of empirical papers don't adopt, however, the kind of “general equilibrium” interactionist view that would be necessary to figure out the likely complementary effects of all these institutional dimensions. The likely diversity of real world institutional forms, as well as of their interactions, has tended to be overlooked by the standard econometric approach generally considering the economic impact of each specific institution in isolation from that of the other institutions. Although empirical studies of developing countries' institutions have proliferated over the two last decades and certainly improved the knowledge of the economic impacts of past and current institutions, they have tended to focus their attention on establishing empirical correlations between isolated general purpose or more specialized institutions and economic outcomes, thereby neglecting possible cumulative effects of the different sectors of the institutional system.

The *institutional complementary* and *institutional hierarchy* assumptions have therefore been neglected by macro-empirical studies, so far. As explained in the present paper, these two dimensions should be addressed more systematically by the empirical literature if the nature of these sets of institutions' economic effects is to be fully understood. A related concern is that the standard approach to measuring the macroeconomic effects of institutions does not precisely define the respective roles of formal and informal institutions in development processes. Yet, economic theory has shown that those bodies of rules might be strongly complementary in shaping actions and decisions, especially when law is not perfectly enforced (Aoki, 2001; Dixit, 2003). Existing studies have not sufficiently disentangled the bundle of economic, political and social formal institutions and there is a chance that the estimated economic effect of each one of them actually incorporates the effect of their complementarity with the other ones. Lastly, since they most commonly use a partial equilibrium setting, considering one unique type of institution in isolation from the other ones, the existing macro-empirical literature is generally unable to analyse the impact of the existence of one given specialized institution on the existence and effectiveness of the other potentially complementary institutions. Addressing this crucial issue would require adopting a general equilibrium setting, or at least, adopting a more systemic view of institutions. This heuristic requirement is supported by the logic of institutional reform that was adopted in developing countries as an answer to the benchmark approach promoted by institutional organizations and bilateral aid agencies.

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Appendix

Table A1a. Clusters of institutions

Reference	Sample	Approach	Indicators	Statistical Treatment
Pryor (2006)	41 developing countries	Clusters of institutions	Market institutions Labour market institutions Enterprises and production sector institutions Government sector institutions Financial sector institutions	Clusters of countries Comparison of cluster performance (GDP growth, growth volatility, inflation)
Rudra (2007)	30 developing countries	Clusters of institutions	Decommodified social protection (social security and welfare spending; housing subsidies; labor market protections) Commodified protection (public investment in education and basic healthcare)	PCA identification Classification of countries
Rosenthal and Voeten (2007)	110 developed/developing countries	Clusters of institutions	Various indicators of procedural formalism	PCA identification
Blume and Voigt (2008)	50 to 130 countries	Clusters of institutions	Various fiscal decentralization, political decentralization and administrative decentralization indicators	PCA identification
Meisel and Ould Aoudia (2008)	85 developed/developing countries	Clusters of institutions	Various dimensions of institutional systems: Political, economic and social	PCA identification
Pryor (2008)	OECD countries	Clusters of institutions	Economic Institutions (various indicators covering the product market, the labour market, the business sector, the government sector and the financial sector) Cultural cluster (various World Value Survey subjective indicators) Performance cluster (various indicators of economic and social performance)	Classification of countries Econometric test of the direction of causation
Roland and Jellena (2011)	30 to 70 developing countries	Clusters of institutions	Political cluster (competitiveness of the political system; executive constraints; Type of political regime; Decentralization) Legal cluster (legal origins; Case law; Tenure of judges; judicial review, Constitution Rigidity) Cultural cluster Religion (fractionalization; Trust, Voice, Order, Anti-corruption values; Anti-authoritarian values)	Principal components Regressions of growth and income on dummies for the different clusters
Siddiqi and Ahmed (2013)	84 developed/	Clusters of institutions	Various indicators of institutional and policy rents (summed up by	PCA identification

	developing countries		three components)	
Combarrous and Rougier (2015)	120 developed and developing countries	Clusters of institutions	Institutional indicators for seven sectors (education, social protection, product market, labour market, finance, agriculture and environment)	PCA identification Clusters of countries Comparison of performances

Table A1b. Pooling of institutions and policies

Reference	Sample	Approach	Indicators	Statistical Treatment
Braga de Macedo and Martins (2008)	Panel of 27 transition countries 1990-2004	Pooling various institutional dimensions	Various indicators of structural and stabilization policies	Score building
Rice and Patrick (2008)	141 developing countries	Pooling various institutional dimensions	Various indicators of state capacities	Score building
Berr et al. (2009)	Panel of 63 developing countries 1980-2000	Pooling various institutional dimensions Growth impact estimation	Various indicators of structural and stabilization policies	Score building Estimation of the growth impact
Pryor (2010b)	90 developed / developing countries in 2000	Pooling various institutional dimensions	Various indicators of private and legally protected ownership of the means of production, competitive markets and economic freedom	Score building Econometric estimation of the effect of economic freedom on political freedom

Table A1c. Institutional complementarities and hierarchies

Reference	Sample	Approach	Indicators	Statistical Treatment
Bokaly and Freund (2004)	108 developing / developed countries 1990-2000	Institutional complementarities	Positive complementary effect of domestic product market deregulation and trade liberalization on GDP growth	Econometric estimation of the interactive term
Chang et al. (2005).	Panel of 22 OECD and 60 non-OECE countries 1960-2000	Institutional complementarities	Positive complementary effect of domestic product market and trade liberalization on GDP growth	Econometric estimation of the interactive term
Licht et al. (2007)	50 developed / developing countries	Institutional hierarchies	The rule of law, control of corruption and political accountability are significantly influenced by various cultural emphases on autonomy versus embeddedness	Econometric estimation, instrumental variable
Fiori et al. (2007)	Panel of 23 OECE countries 1980-2002	Institutional complementarities	Positive complementary effect of labor and product market deregulations	Econometric estimation of the interactive term
Aghion et al. (2008)	Panel of 64 industries in 16 Indian states over 1980-1997	Institutional complementarities	Positive complementary effect of labor (pro-employer) and product market (delicensing) regulations on output growth	Econometric estimation of the interactive term
Eicher and Leuckert (2009)	27 OECD and 87 non-OECE countries	Institutional hierarchies	Political institutions condition various economic outcomes via their impact on the quality of structural policies	Econometric test, political institutions as instrumental variable of economic institutions
Eicher and Schreiber (2010)	11 year panel of 26 transition countries	Institutional hierarchies	Political institutions condition GDP growth via their impact on the quality of structural policies	Econometric test, political institutions as instrumental variable of economic institutions
Besley and Persson (2011)	Not relevant	Institutional Complementarities	State legal capacities (Protection of property rights) State fiscal capacities (Total taxes as a share of GDP) Investment in public goods	No
Gorodnichenko and Roland (2011)	67 developed / developing countries	Institutional hierarchies	Causal effect of individualism on income per worker and total factor productivity Two-way causal effect between culture and institutions	Econometric estimation, instrumental variable
Acemoglu and Robinson	Not relevant	Institutional Complementarities	Inclusive economic institutions (Property rights, rule of law for all; equal	No

(2012)			access to public service; open access to markets) Inclusive political institutions (Centralization; State legal and fiscal capacity to enforce over the whole territory; Pluralism and democracy)	
Gollwitzer and Quintyn (2012)	108 developing and developed countries	Institutional Complementarities	Rule of law for all (constraints on the executive; judiciary Independence; Government respect of contracts; Property rights enforcement) Permanence and stability of organizations (political stability; Stability and independence of organizations) Non-military politics (political control of the legal armed forces; military interference in political life; level of armed violence in society)	Composite indicators Regressions of GDP per capita, inequality and democracy
Bjornskov and Méon (2012)	115 developed / developing countries	Institutional complementarities	Informal institutions (trust) and formal institutional quality increase private investment	Econometric estimation of the cumulative impact of institutions
Voigt and Gutman (2013)	Panel of 132 countries	Institutional complementarities	Positive complementary effect of <i>de jure</i> property rights and <i>de facto</i> judicial independence	Econometric estimation of the interactive term
Méon and Sekkat (2013)	Panel of 46 developed / developing countries 1984-2009	Institutional complementarities	Positive complementary effect of informal (trust) and formal (product market regulations) on private investment	Econometric estimation of the interactive term
Acemoglu, Robinson and Santos Villagran (2013)	Panel of Colombian municipalities 1991-2006	Institutional complementarities	Predatory informal institutions, like paramilitary, have reinforced the efficiency and return, for the elites, of equally predatory formal political institutions	Econometric estimation
Siddiqi and Ahmed (2013)	84 developed/developing countries	Institutional complementarities	Three components of institutional governance Complementary GDP growth effect of weaker political rents and stronger risk-reducing technologies	OLS and GMM estimation Interactive term
Maystre et al. (2014)	Panel of 79 developed / developing 1989-2004	Institutional hierarchies	Economic outcomes, institutions and culture move simultaneously and bear multiple mutual linkages	Econometric estimation, instrumental variable

over the long run				
Flachaire et al. (2014)	77 countries	Institutional hierarchies	Political institutions determine economic institutions	Econometric test, instrumental variable
Rougier (2014)	84 developed / developing countries in 2006	Institutional complementarities	Adverse complementary effect of political institutions (authoritarianism) and redistribution (transfers and subsidies) on structural change	Econometric estimation of the interactive term

Notes

¹ Aron (2000) was the first survey of the macro-empirical literature on institutions and economic development. See also Jutting (2003) or Balland et al. (2011). Although a growing body of literature has also addressed the microeconomic foundations of specific institutions, notably by analyzing each of them as the Nash equilibrium result of a specific strategic game played by rational agents under limited information (Kandori, 1992, Aoki, 2001; Dixit, 2005), it won't be surveyed by the present paper which focus is placed on empirical works.

² Eicher and Schreiber (2010) make a similar point reporting that, when referring to the contracting and market-supporting institutions, Hall and Jones (1999) use for example the term "social infrastructure", which also includes trade openness indicators, Acemoglu et al. (2005) refer to "economic institutions," Rodrik et al. (2004) simply say "institutions," whereas Persson (2005) uses "growth promoting policies" and Balland, Moene and Robinson (2011) indifferently use the terms institutions and structural policies.

³ For an illuminating analysis of this instrumentation of institutional reforms and ranking by developing countries administrations as signals sent to aid donors and financial organization, see Andrews (2013).

⁴ The influence of political leadership on economic performance and institutional design has recently been investigated (Jones and Olken, 2005; Easterly, 2011). Under strong leadership, not only are reforms more deeply and time-consistently implemented, but their shape is also more fitted to the specificities of the national context, thereby driving durably positive functional effects (Andrews, 2013). Ghana and Côte d'Ivoire recent stories can be contrasted in this respect, with the former having demonstrated leadership autonomy resulting in the gradual making of an effective, albeit hybrid, institutional system (Combarrous and Rougier, 2015).

⁵ For examples of empirical studies proceeding to such information reduction in order to limit the multicollinearity risk of integrating them separately in a single regression framework, see Knack and Keefer (1995), Hall and Jones (1999), Bjornkov (2006) or Siddiqi and Ahmed (2013).

⁶ By mirroring household survey's experience-based questions about petty bureaucratic corruption in eight African countries with a sample of 350 experts' opinions, Razafindrakoto and Roubaud (2010) have measured the scope of experts' errors of assessment and explained them by ideological biases based on experts' own political preferences or on the consideration of an implicit cultural model of "how Africa works". Likewise, by using World Bank Enterprise Surveys' perceptions-based indicators of the quality of the business Environment from 38 countries, Kaplan and Pathania (2010) show that firm responses are critically influenced by macroeconomic conditions and by the type of relation with regulatory agencies and are finally poorly informative about the changes in the business environment.

⁷ Pande and Udry (2005) have pointed to the limitations that are placed on the robustness of empirical results by the fact that they rely on an indirect causality link between distant determinants of distant institutions and current institutions. Moreover, measurement and omitted variables problems may limit the capacity of external instrumentation to assess the net effect of institutions on economic development (Pande and Udry, 2005; Albouy, 2008; Sachs, 2013).

⁸ Battacharya (2008) has empirically tested Rodrik's typology on a panel of developing and developed countries. He shows that whereas strong market creating institutions and market stabilizing institutions are growth enhancing, market regulating institutions matter up to a certain extent, and market legitimizing institutions does not seem to matter at all.

⁹ Likewise, Williamson (2000) argued that although property rights have been defined by as a typical illustration of the *rules of the game*, defining individual agents' opportunity sets, systems of basic incentives and structure of transaction costs, contracting arrangements supporting the *play of the game* often take informal modalities.

¹⁰ In the specific context of technologically advanced societies, Williamson (2000) made a similar point, explaining that the public ordering of transactions, through constitutional or formal bodies of rules, are articulated to private orderings, *i.e.* local contract or organization designed to maximize the control or reduce the costs of transactions.

¹¹ Acemoglu and Johnson (2005) however argue that while individuals may find ways of complementing formal and informal contracts to avoid the adverse effects of weak formal contracting institutions, they probably find it harder to mitigate the risk of expropriation in this way.

¹² More formally, Acemoglu (2003) show that the institutions and policies serving the interests of rulers at the expense of the rest being can be sustained because former are not compelled to make commitments to bind their future actions by the absence of external mechanism of commitment.

¹³ More formally, if the difference in utility $U(x') - U(x'')$ generated by two alternative institutions, x' and x'' , increases for all actors in domain X when z' , rather than z'' , prevails in domain Z, and vice-versa, then x' and z' (as well as x'' and z'') complement each other, and constitute alternative equilibrium combinations (Aoki, 2001). For a survey of the literature on institutional complementarities for OECD countries, see Amable (2003). For an in-depth account of all the notions of institutional complementarity, see Aoki (2001, 2005).

¹⁴ This systemic property has also been called supermodularity (Milgrom and Roberts 1990; Topkis, 1998).

¹⁵ For a criticism of this conception, which may have led most CC scholars to adopt a reductionist vision of institutional change, see Becker (2009).

¹⁶ Pryor (2008, 2010) develop systemic logic even further, claiming that « it is not particular characteristics in domain X that determine any given system in domain Y, and it is not a particular system in domain X that determines any particular characteristic in domain Y. Rather, it is a particular system in domain X that causes a particular system in domain Y » (Pryor, 2008: 546). In order to consistently address cumulative causality, he accordingly compares the country composition of institutional clusters with that of economic outcome clusters.

¹⁷ For a survey of the Comparative Politics literature, see Jackson and Deeg (2006).

¹⁸ That system, nevertheless, had to change and adapt when it became progressively inappropriate with respect to the Chinese economy's changing needs (Xu, 2012).

¹⁹ During the 1990s, this property was enunciated by the CC and NIE authors, as well as by comparative systems scholars like Kornai (1995) who pointed to the strong congruence of the institutions organizing the allocation of resources and the forms of ownership in economic systems.

²⁰ Schneider (2009) argues that in *HMEs*, the hierarchical principle of governance is less the result of joint gains from hierarchies realized by a majority of agents and extended to other spheres, than it is the result of the political and business elites' influence in initial institutional formation.

²¹ On the race to the bottom assumption see Rudra (2007) and Olney (2013) for a recent empirical study supporting as regards labor market regulations.

²² Since it assumes that institutional effectiveness is independent of local conditions by imposing a standardized institutional technology on undifferentiated countries, this benchmark approach was labeled "monocropping view" by Evans (2004).

²³ China is in no way an isolated case, since Rodrik (2007; 2010: 41) reports similar unconventional institutional configurations for South Korea in the 1960s and 1970s, for Mauritius during the 1970s and 1980s, as well as for India during the 1980s and 1990s.

²⁴ It is worth remarking that de facto complementarities are implicit in the series of country-case studies brought together in Rodrik (2003). Each of those studies, as Dani Rodrik emphasizes in his introduction to the book, underlines the pragmatic and adaptative nature of the selected developing countries' trajectories of institutional change during the 1980s and 1990s.

²⁵ For example, private property and legal protection is measured by a composite index averaging law-and-order, and the extent of public and private ownership of the means of production.

²⁶ Moreover, such one-dimensional measurements of capitalism are just strong correlates of the levels of GDP per capita. Pryor's index of capitalism and GDP per capita are strongly and significantly correlated (0.690).

²⁷ There are different domain definitions in CC literature. The most common partition is in two general domains: state-business and capital-labor relations. But their decomposition recovers the different domains of our typology which is akin to Amable (2003).

²⁸ In particular, the historical instruments that are widely used by macro-empirical studies since Acemoglu et al. (2001) do not treat that time-dimension.

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