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Do We See Convergence in Institutions? A Cross-Country Analysis

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Abstract

We use cross-section and panel data methods to test for conditional and unconditional convergence in a broad range of institutions that support the functioning of the economy in a large sample of countries from the 1970s to 2010. We find that legal, bureaucratic and administrative institutional quality tended to slowly rise in countries with initially poor institutions, regardless of their initial conditions. This process is significantly faster if economies share the same structural characteristics and it does not depend on the reforms occurring in a specific region or group of countries. The results are also robust to checks for measurement error, outliers and influential variables. Finally, the evidence also suggests that the speed of convergence has changed over time. A significant acceleration of the convergence process results from the end of the Cold War. However, such effect on the catch-up of the institutions of transition and developing economies to the high quality institutions of advanced market economies has weakened in the new millennium. We conclude by speculating on the political economy factors underlying the results.

Keywords: Convergence, Institutions, Institutional Change, Growth, Economic Development

JEL Classification Code: O1, P1, P5

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1. Introduction

One of the most important findings in the literature on the determinants of economic growth is that differences in the quality of institutions (defined as the quality of rules, regulations, laws and policies that affect economic incentives to invest in technology, physical capital and human capital) explain in large part differences in per capita income across countries (Hall and Jones, 1999; Acemoglu, Johnson and Robinson, 2001; and Rodrik et al., 2004). Rich countries, especially those located in the North America, Western Europe, Australia and New Zealand, have better quality institutions and higher per capita income than countries in the developing world. Although some researchers warn on how general such claim is in history (Chang, 2011), the claim is a forceful one. As Acemoglu (2009) argues, "there is convincing empirical support for the hypothesis that differences in economic institutions, more than luck, geography or culture, cause differences in incomes per capita" (p.123). If institutional quality is a crucial determinant of economic growth, we need a better understanding how institutions evolve and under what circumstances they change. One step in this direction is to ask whether we observe convergence in institutions as low income countries with poor quality institutions adopt the best practice institutions that are prevalent in the richer countries.

Economists have long been interested in the phenomenon of convergence. Traditionally, empirical work has been concerned with convergence in national income levels (e.g., Sala-i-Martin, 1996; Quah, 1993; Barro, 2012; Rodrik 2011 and 2013; Pritchett, 1997). But the analysis of convergence has extended to other economic phenomena. The idea behind this line of research is to investigate whether, or to what extent, the dynamics of globalization is fostering similarities in the structure of economies and in development outcomes. Ravallion (2003 and 2012) tests for and finds evidence of slow convergence in income distribution, but no evidence of poverty convergence. Deaton (2004) and Canning (2012)

look at the evolution of health, showing convergence in life expectancy across countries. Khanna et al. (2006) find evidence that economically interdepend countries have similar corporate governance laws protecting stakeholders. Bruno et al. (2012) find partial evidence of convergence in financial systems across OECD economies. More closely aligned with the focus of our paper, Keefer and Knack (1997) and Knack (1996) show that the ability of poor countries to catch up to the income levels of rich countries, is determined in large part by the quality of their institutions, and that income convergence is more pronounced in countries with similar levels of institutional quality. If indeed institutions are crucial to income convergence, are contemporary differences in institutional quality between countries transitory or permanent? And to what extent do we see catch up in institutional quality between countries? This paper contributes also to this tradition by studying the convergence of a broad range of institutions that support the functioning of the economy.

We examine the evolution over time and test for convergence in institutional quality across countries. Since the literature on the empirics of economic growth is unclear on the precise type of institution that matters for economic growth (Bardhan, 2005), we use a variety of institutional quality measures, such as the administrative and legal capacity of the state (Besley and Persson, 2011), the rule of law (Rodrik et al., 2004; Haggard and Tiede, 2012), the contracting environment and the security of property rights (Acemoglu, Johnson and Robinson, 2001). We use different data sets and periods of analysis, depending on the institutional variables that we examine, with our sample of countries ranging from 50 to 179, and our longest period of analysis being 1970-2010. We find that institutional quality tended to (slowly) rise in countries with initially poor institutions, regardless of their initial conditions. This process is faster if economies share the same structural characteristics and does not depend on the reforms occurring in a specific region or group of countries. The evidence also suggests that a significant acceleration of the convergence process results from

the end of the Cold War. However, such effect on the catch-up of the institutions of transition and developing economies to the high quality institutions of advanced market economies has weakened in the new millennium.

The paper proceeds as follows. In Section 2, we briefly discuss the literature on institutions and review what we may expect on whether institutional quality may converge across countries. Section 3 illustrates the data and the stylised facts on the evolution of institutional quality. Section 4 discusses the methodology and the convergence tests results. Section 5 concludes.

2. Why we may expect convergence in institutional quality (and why we may not)

Should we expect convergence in institutional quality across countries? Both the theoretical and empirical literature remain ambivalent about this possibility. For example, La Porta et al (2008, p.327) speculate that convergence in institutional quality will occur as a result of increasing globalization, as it leads to faster exchange of ideas and to higher competition for FDI. This, in turn, will respectively encourage the transfer of legal knowledge and the adoption of good regulations. But the process of institutional reform, and eventual convergence, may be rather slow, as the appropriate choice of institutions depends on a society's structural characteristics (Djankov et al., 2003).

We would expect that institutional convergence would be more rapid since the 1990s with the onset of structural adjustment programmes in Africa and Latin America as well as the end of the Cold War. Thus, the adoption of market institutions of the West in developing and transition economies may have been accelerated by the spread of the post-Washington Consensus among donor agencies and Southern governments in the 1990s, which "aimed at the creation of institutions that helped markets" (e.g. legal framework and institutions,

property rights, competition policy and contract enforcement), and in the enforcement of governance related conditionalities in structural adjustment programmes by international financial institutions (Stiglitz, 1998; Kapur and Webber, 2000). In addition, with the end of the Cold War in the early 1990s, both ex command economies and non-socialist developing economies underwent major institutional changes, adopting similar production and exchange mechanisms based on privatization and deregulation. Historical research has noted that the end of the Cold War and the ensuing fall of the Soviet Union drastically weakened economic and military support for Marxist regimes (e.g., Simensen, 1999). At the same time, this gave rise to the spread of Anglo-Saxon style capitalist institutions (see Chang, 2007). 'Institutional mono-cropping' was the prevalent norm as "international organizations, local policy makers and private consultants combine(d) to enforce the presumption that the most advanced countries have already discovered the one best institutional blueprint for development and that its applicability transcends national cultures and circumstances" (Evans, 2004 p.33). The transplanting of what were considered as 'best practice' institutions to developing and transition economies occurred in the 1990s in a decade which was widely seen as 'the decade of institutional reform' (Mkandawire, 2012).

However, institutional mono-cropping did not seem to deliver the results in terms of expected economic performance in countries which adopted Western-style institutions (Chang, 2007), in part due to the lack of fit with the prevailing social and cultural context (Rodrik, 2008; Roland, 2004; Berkowitz et al., 2003) and in part due to the fact that governments in developing countries did not have the capabilities to enforce the successful functioning of these institutions (Khan, 2012). This may have led to a weakening of the incentives of Southern policy-makers to adopt Western-style institutions over time (Mkandawire, 2012).

From a theoretical standpoint, new institutional economics argues that poor quality institutions will not persist over time, as economic agents realize the growth enhancing effects of better quality institutions (Williamson, 1996) and seek to replace inefficient institutions with more efficient institutions. However, such a positive view of institutional change has been challenged by other views looking at the role of social conflict and the elites. A conflict over the distribution of resources creates insurmountable commitment problems for institutional change. For the rich (poor) cannot commit to compensate the poor (rich) after old rules have been replaced with new ones (Acemoglu, 2003; Bardhan, 2005). As a result, 'bad' institutions can persist. Taking this view further, Acemoglu and Robinson (2006, 2008) argue that institutional reforms may be hindered by elites who benefit from existing economic institutions. Political elites who hold power will always have an incentive to maintain the political institutions that give them political power, and the economic institutions that distribute resources to them. Therefore, there would be a persistence of poor quality economic and political institutions in such societies, since the elites who benefit from these institutions would not have any incentives to change them (Acemoglu and Robinson, 2012). Similarly, inspired by the facts of the Russian transition, Sonin (2003) argued that wealthy elites may prefer to establish corrupt relationships with state authorities in order to manipulate the legal system in their favor, rather than supporting public protection of property rights, so perpetuating a system with poor property rights institutions.

The above discussion suggests that ultimately, whether economies with poor quality institutions catch up with economies with high quality institutions, and how fast, are a matter of empirical debate as neither the theoretical nor the previous empirical literature provides any clear and unambiguous answer on what we may expect. In this paper, we investigate whether there has been a process of catch-up in countries with poor quality institutions through simple convergence tests. Before we proceed to the tests for convergence, we

describe the data that we will use and provide some descriptive statistics on the evolution of institutional quality across countries.

3. Variables and descriptive statistics

This section illustrates the measures of institutional quality, examining the trends of legal, bureaucratic and administrative institutional quality measures. Since institutions are persistent phenomena and should be analyzed over long periods, we concentrate on cross-country data with the longest temporal (and a substantial geographical) coverage provided by International Country Risk Guide (ICRG, 2012) and the Fraser Institute (Gwartney and Lawson, 2007). The appendix provides details on each database and on the countries observed.

The ICRG database (ICRG, 2012), constructed by *Political Risk Services*, covers the 1985-2010 period.[1] The ICRG variables are the most commonly used measures of institutional quality in the empirical literature on institutions and growth (e.g., Knack and Keefer 1995, Hall and Jones 1999, and Acemoglu, Johnson and Robinson 2001). The data comes from subjective assessments of foreign investors and business experts. It includes three continuous variables (rescaled to range between zero and ten): *Rule of Law*, *Corruption in Government*, and *Bureaucratic Quality* indices. The first one is an indicator of legal capacity of the state; the last two capture the level of bureaucratic and administrative quality.

Another subjective measure, which captures significant dimensions of legal capacity, allows to observe the longest period: the *Quality of Legal Structure and Security of Property Rights index* (Gwartney and Lawson, 2007). This is a component of the *Fraser Institute index of Economic Freedom,* and is a continuous variable ranging between zero and ten, with a higher score corresponding to higher quality of institutions. This is the only available

[1] To be precise, this database starts in 1984, but observes fewer countries in that year (106) than in 1985 (124). Moreover, we start from 1985 for ease of comparison with the Fraser Institute data, our other core variable.

indicator over a long time span, also for some developing economies. It has, in fact, been recorded every five years from 1970 until 2000 (and every year from 2001 on), but between 1970 and 1975 only fifty countries are observed. Unfortunately, it samples fewer countries than the ICRG database. The index has been assembled over the years from different sources – essentially, but not exclusively, from: the ICRG, the *Business Environment Risk Intelligence* and the *Global Competitiveness Report* – and has undergone some changes in definition, although the underlying concept remains unchanged (see, for details, Gwartney and Lawson, 2007). Table 1 shows their trends, comparing economies at different stages of development over 1980-2010.[2]

The first stylized fact is the gap in institutional quality between advanced economies and the rest remains wide. Since the 1980s, both developing and advanced economies have, by the end of the observed period, experienced improvements in the *Quality of Legal Structure and Security of Property Rights*, in the *rule of law* and in the *bureaucratic quality* index. The *Corruption in Government* index, instead, worsened in both advanced and developing countries over the 1985-2010 period. The transition economies saw a deterioration in the quality of the legal system, property rights protection and corruption, but also improvements in measures of bureaucratic quality and rule of law.

A second stylized fact is that the cross sectional dispersion over the whole sample (as expressed by the coefficient of variation), from the beginning to the end period, decreases in all measures. However, the decrease is generally monotonic until 1995, but subsequently the dispersion picks up again or becomes stable, so suggesting that a likely convergence effect in institutional quality has stopped or decelerated. According to all four measures, advanced

[2] In table 1, samples sizes may vary over time, especially for transition economies. The risk is that such variation may bias the comparisons. However, the results obtained by keeping the sample invariant over time (not reported here, but available upon request) show little sensitivity.

economies remain a more homogenous group than developing and transition economies, which show greater variability in institutional quality at the end of the period.

Table 1: Institutional quality the world around: 1980-2010								
Panel (a): *Quality of legal structure and security of property rights* index								
Year		1980	1985	1990	1995	2000	2005	2010
Whole sample	Mean	5.01	5.09	5.31	5.87	5.83	5.85	5.60
	CV	0.40	0.36	0.36	0.29	0.33	0.30	0.29
	N	90	110	111	123	123	139	142
Advanced Economies	Mean	7.19	7.05	7.55	8.18	8.34	8.17	7.64
	CV	0.13	0.18	0.15	0.13	0.14	0.11	0.12
	N	28	30	30	30	30	30	30
Developing Economies	Mean	4.03	4.19	4.27	4.98	4.87	5.05	4.84
	CV	0.36	0.31	0.32	0.22	0.27	0.28	0.27
	N	62	73	74	78	78	86	87
Transition Economies	Mean		5.95	6.46	5.90	5.82	5.73	5.69
	CV		0.21	0.13	0.19	0.14	0.17	0.12
	N		7	7	15	15	23	25
Panel (b): *Bureaucratic Quality* index								
Whole sample	Mean		5.07	5.17	5.74	5.44	5.35	5.47
	CV		0.64	0.61	0.50	0.53	0.53	0.51
	N		124	131	130	140	140	139
Advanced Economies	Mean		8.77	8.66	9.33	9.38	9.21	9.21
	CV		0.19	0.21	0.12	0.11	0.14	0.14
	N		32	31	30	30	30	30
Developing Economies	Mean		3.81	3.87	4.46	4.20	4.12	4.30
	CV		0.73	0.69	0.51	0.52	0.50	0.46
	N		80	88	88	87	87	87
Transition Economies	Mean		3.75	5.00	5.54	4.89	4.84	4.83
	CV		0.53	0.38	0.41	0.50	0.46	0.47
	N		12	12	12	23	23	22
Panel (c): *Rule of Law* index								
Whole sample	Mean		5.40	5.12	7.18	6.56	6.32	6.17
	CV		0.49	0.53	0.31	0.35	0.34	0.36
	N		124	131	130	140	140	139
Advanced Economies	Mean		8.47	8.34	9.75	9.07	8.91	8.86
	CV		0.23	0.27	0.06	0.15	0.11	0.10
	N		32	31	30	30	30	30
Developing Economies	Mean		4.17	3.83	6.11	5.57	5.27	5.09
	CV		0.45	0.48	0.31	0.36	0.35	0.36
	N		80	88	88	87	87	87
Transition Economies	Mean		5.97	6.19	8.44	6.88	6.85	6.71
	CV		0.35	0.31	0.16	0.21	0.16	0.17
	N		12	12	12	23	23	22
Panel (d): *Corruption in Government* index								
Whole sample	Mean		5.56	5.62	5.87	4.94	4.17	4.48
	CV		0.46	0.43	0.36	0.41	0.48	0.42
	N		124	131	130	140	140	139
Advanced Economies	Mean		8.50	8.31	8.44	7.20	7.13	7.26
	CV		0.21	0.20	0.18	0.28	0.22	0.22
	N		32	31	30	30	30	30
Developing Economies	Mean		4.37	4.49	4.92	4.25	3.32	3.72
	CV		0.45	0.42	0.32	0.35	0.36	0.30
	N		80	88	88	87	87	87
Transition Economies	Mean		6.11	6.75	6.37	4.58	3.47	3.64
	CV		0.24	0.20	0.19	0.41	0.26	0.25
	N		12	12	12	23	23	22
Notes: data is from Qwartney and Lawson (2007) and ICRG (2012). Countries' classification follows the IMF system, based on per capita income level, export diversification and degree of integration into the global financial system (http://www.imf.org/external/pubs/ft/weo/2011/01/weodata/groups.htm, accessed on 25/8/2011).								

4. Convergence tests

Since we are interested in whether poorer countries are narrowing their institutional quality gap with richer countries, which is a between-country regularity, cross section data is

an appropriate place to look for evidence of convergence. A simple test for convergence is to regress the observed relative changes over time on a given measure on the measure's initial values across countries. Let G_{it} denote the observed institutional quality measure in country i observed at both date $t=0$ and $t=T$, i.e., at the beginning and at the end of the sample period respectively. A test equation for institutional quality convergence is then:

$$(\ln G_{iT} - \ln G_{i0})/T = \alpha + \beta G_{i0} + \varepsilon_i \qquad \text{with } i=1, \ldots, N \qquad (1)$$

where the dependent variable is the average annual growth rate in institutional quality, α and β are parameters to be estimated and ε_i is a zero mean error term.[3] According to (1), a negative (positive) estimate of the parameter β implies that there is institutional quality convergence (divergence). This means that two countries exhibit convergence if the one with lower initial institutional quality experiences faster improvements in institutional ratings (as expressed by the growth rate) than the other and so tends to close the gap with the high-quality institutions country. The magnitude of β expresses the speed of convergence (convergence). In particular, equation (1) is a test for the hypothesis of unconditional convergence, according to which institutions of countries converge to one another in the long-run independently of their initial conditions, i.e., differences are transitory.

To eyeball the data, figure 1 presents the scatter plots, fitting a simple regression line, for the *Quality of Legal System and Security of Property Rights*, which is the measure with the longest time coverage. Evidence of unconditional convergence is apparent both when the initial value is 1985 and when the plot extends to the earlier initial values (1970 being the earliest), therefore suggesting that economies with weaker institutions in 1985 are expected to catch up with the economies having high-quality institutions to start with. However, the

[3] Alternatively, convergence tests based on absolute changes give consistent results to those presented below.

significance and speed of the convergence process can best be assessed when referring to the regression estimates.

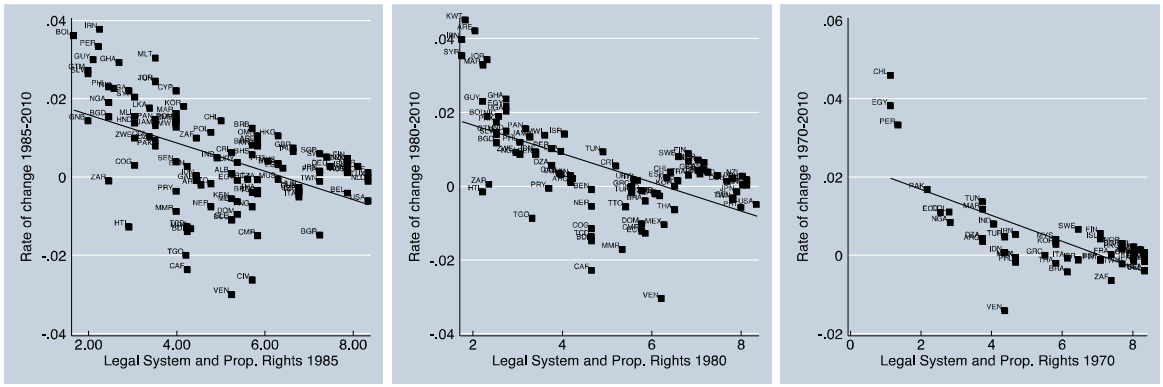

Figure 1 – Initial level of institutional quality vs. subsequent rate of change: various periods

4.1 Unconditional convergence

Panel (a) in Table 2 reports unconditional convergence estimates over the period 1985-2010 for the ICRG measures; and over 1985-2010, 1980-2010 and 1970-2010 for the *Quality of Legal System and Security of Property Rights*. The estimates show that within-country institutional quality has been converging since the 1980s, with the coefficients on initial measures both negative and statistically significant at the one per cent level. To give an appreciation of the speed of convergence, consider *Quality of Legal System and Security of Property Rights* in 1985 in Bangladesh (scoring 2.46 out of 10) and Belgium (scoring 7.88). The two countries are both on the regressions line, but positioned nearly at its opposite extremes. Bangladesh has indeed been often cited as an example of poor institutions, while Belgium is an advanced economy with high quality institutions. According to the estimates in the first column, the expected annualized growth in *Quality of Legal System and Security of Property Rights* will be $0.023 - 0.004 \times 2.46 = 0.014$ percentage points in the former case and $0.023 - 0.004 \times 7.88 = -0.006$ in the latter. Such trends imply that, after 25 years, the two countries are predicted to reach a rating of $2.46 \times e^{25 \times 0.014} = 3.51$ and $7.88 \times e^{25 \times -0.006} = 6.89$, respectively. This is indicative of a significant, albeit slow, process of convergence over the

period 1985-2010, where economies with low-quality institutions may remain so for generations before they close the gap. Repeating this exercise for the other indices leads to similar conclusions.

Table 2: Convergence in institutional quality						
Panel (a): Unconditional convergence						
	Fraser Institute measures, 1970-2010 growth			ICRG measures, 1985-2010 growth		
	Legal system and property rights, 1985-2010	Legal system and property rights, 1980-2010	Legal system and property rights, 1970-2010	Bureaucratic quality	Rule of law	Corruption in government
Initial value	-0.004***	-0.004***	-0.003***	-0.005***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.023***	0.024***	0.023***	0.034***	0.032***	0.019***
	(0.003)	(0.004)	(0.005)	(0.005)	(0.003)	(0.005)
F-stat	43.318***	40.872***	19.418***	59.858***	92.335***	33.829***
Adj. R-Sq.	0.248	0.332	0.48	0.341	0.356	0.299
Obs.	110	90	50	121	121	121
RMSE	0.011	0.011	0.008	0.024	0.016	0.018
Panel (b): Conditional convergence						
	Fraser Institute measures, 1970-2010 growth			ICRG measures, 1985-2010 growth		
	Legal system and property rights, 1985-2010	Legal system and property rights, 1980-2010	Legal system and property rights, 1970-2010	Bureaucratic quality	Rule of law	Corruption in government
Initial value	-0.008***	-0.006***	-0.006***	-0.010***	-0.008***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.010	0.027*	0.093***	0.051	0.035	0.014
	(0.016)	(0.015)	(0.022)	(0.033)	(0.021)	(0.048)
F-stat	9.568***	16.665***	8.750***	11.660***	19.22***	13.390***
Adj. R-Sq.	0.578	0.710	0.665	0.602	0.610	0.508
Obs.	92	78	41	95	95	95
RMSE	0.009	0.007	0.007	0.019	0.013	0.015
Notes: the dependent variable is the average annual growth rate of each institutional measure. Symbols *, ** and *** stand for significant at 10, 5 and 1% respectively, two-tailed test. Heteroskedasticity-Robust Standard errors are in parentheses. Each conditional convergence regression controls for the initial value of: per capita GDP (natural log), secondary enrolment rate, *Polity2* index, regional dummies (Latin America, Asia, Sub-Saharan Africa, Middle East and North Africa and transition economies), legal origins dummies (French, German, Scandinavian and Socialist systems), latitude, ethnic fractionalisation and share of major religions (Catholic, Muslim and other major religions).						

4.2 Conditional convergence

Results on unconditional convergence suggest that differences in institutional quality between countries may be closing, but this is a rather slow process. Would this process be faster among countries that share the same structural characteristics? This means considering the conditional convergence hypothesis: countries' institutions converge to one another in the long run, if their structural characteristics are identical (i.e., differences may be permanent due to cross-country structural factors). A test equation for institutional quality conditional convergence is then:

$$(\ln G_{iT} - \ln G_{i0})/T = \alpha + \beta G_{i0} + \gamma \mathbf{X}_{i0} + \varepsilon_i \qquad \text{with } i=1, \ldots, N \tag{2}$$

where $\mathbf{X}_{i0}$ is a set of explanatory variables that account for long-run determinants of institutional change across countries. It includes the following controls: (i) the initial level of per capita GDP (Heston et al. 2011), as institutions can evolve depending on the stage of economic development, e.g., see Barro (2012); (ii) the initial level of education, measured by secondary enrolment rate (World Bank 2011b), as the quality of human capital can be positively related to designing functional institutions; (iii) the initial level of political democracy (Savoia et al. 2010), using *Polity 2* index.[4] (iv) continent dummies, to capture regional fixed effects; (v) distance from the equator, to capture geographical effects; (vi) legal origins dummies, as proposed by La Porta et al. (1999); (vii) the share of major religions in 1980 (Catholic, Protestant and Muslim), from La Porta et al (1999), to capture the effect of culture; (viii) ethnic fractionalization, from Alesina et al. (2003), as a proxy for cultural homogeneity.

In equation (2), a negative (positive) estimate of β implies conditional convergence (divergence) in institutions. The results, in panel (b) of Table 2, do suggest that institutions in countries with identical structural characteristics converge. The convergence process is faster than in the case of unconditional convergence, i.e., when countries share the same stage of development, political system, education level and other structural characteristics. But it seems still a process that can take many years. Considering again the first column, the estimated β suggests that a country with a low *Quality of Legal System and Security of Property Rights* index in 1985 will close the gap at an average 0.8 per cent every year (ceteris paribus).

[4] We experiment also with other democracy variables: the *Constraints on the Executive* index and *Vanhanen's index*. Our results are unchanged. Furthermore, to capture the role of social conflict and the influence of elites (see Savoia et al. 2010), we additionally controlled for the initial level of income inequality, using the Gini index, also when interacted with the initial level of political democracy. The results are similar, and are not included here, but are available on request.

4.3 Has the speed of convergence been uniform across the world?

While on average institutions are converging worldwide, the average trends may still mask considerable variation in the experience of individual regions. In this section, we investigate this possibility. This is equivalent to testing if the process of conditional convergence may be more pronounced in developing regions or in the transition economies, due to region-specific characteristics.

Table 3: Conditional convergence in institutions: regional variation

	Fraser Institute measures		ICRG measures		
	Legal system and property rights, 1985-2010	Legal system and property rights, 1980-2010	Bureaucratic quality, 1985-2010	Rule of law, 1985-2010	Corruption in government, 1985-2010
Initial value	-0.003*	-0.003*	-0.007***	-0.006***	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Initial value * Latin America dummy	-0.007***	-0.004*	-0.005*	-0.004	-0.005*
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Initial value * Asia dummy	-0.002	-0.001	-0.005**	-0.003	-0.009**
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)
Initial value * sub-Sah. Africa dummy	-0.005*	-0.003	-0.004	-0.004**	-0.009***
	(0.003)	(0.002)	(0.004)	(0.002)	(0.003)
Initial value * MENA dummy	-0.007**	-0.007***	-0.002	-0.001	-0.005
	(0.003)	(0.002)	(0.002)	(0.004)	(0.004)
Initial value * Transition econ. dummy	-0.003		-0.003	-0.003	-0.003*
	(0.003)		(0.003)	(0.003)	(0.002)
Constant	-0.031	-0.002	0.012	0.005	-0.037
	(0.022)	(0.022)	(0.036)	(0.027)	(0.054)
F-stat	10.565***	27.058***	17.820***	131.930***	13.760***
R-Squared	0.609	0.732	0.590	0.602	0.551
Obs.	92	78	95	95	95
RMSE	0.008	0.006	0.019	0.014	0.014

Notes: the dependent variable is the average annual growth rate of each institutional measure. Symbols *, ** and *** stand for significant at 10, 5 and 1% respectively, two-tailed test. Heteroskedasticity-Robust Standard errors are in parentheses. Each conditional convergence regression controls for the initial value of: per capita GDP (natural log), secondary enrolment rate, *Polity2* index, regional dummies (Latin America, Asia, Sub-Saharan Africa, Middle East and North Africa and transition economies), legal origins dummies (French, German, Scandinavian and Socialist systems), latitude, ethnic fractionalisation and share of major religions (Catholic, Muslim and other major religions).

Dividing the sample into advanced, transition and into developing economies regions (according to their continents), we estimate a version of equation (2) augmented with interaction terms between initial level of institutions and transition, Latina America, MENA, Asia and sub-Saharan Africa dummies (advanced economies being the benchmark). Table 3 presents the results. Surprisingly, the discernible regularity is that there is no evidence of stronger convergence in the group of transition economies. There is also some indication that there has been stronger (conditional) convergence in the Latin America, Asia, sub-Saharan Africa and the MENA region, as compared to advanced economies. However, the trends are not consistent across measures.

4.4 Do influential or outlying observations drive the results?

The results are generally insensitive to using robust regression methods and to formal checks for influential and outlying observations. First, we estimate each of the above regressions using Iteratively Reweighted Least Squares (IRLS), which down-weights observations with large residuals. The results show little divergence from those presented above. Similarly, by excluding from the regression countries with large DFITS statistics (the threshold is $\left|DFITS_j\right| > 2\sqrt{k/N}$), we conclude that influential observations do not significantly affect our estimates. Finally, we have calculated DFBETA statistics to check whether influential observations affect the magnitude of the convergence parameter, β. Its estimate shows little sensitivity once we remove from the regressions values that are above the cut-off $\left|DFBETA_j\right| > 2\sqrt{N}$. For example, countries that seem to be potentially influential for the convergence parameter of the *Quality of Legal System and Security of Property Rights* index are Venezuela, Central African Republic, Peru and Guatemala. In sum, this exercise provides evidence in support of the generality of the results.

4.5 Convergence when institutions are measured with error

A robustness issue that empirical research on institutions does not always address is to what extent measurement error could be affecting the results. In this context measurement error arises from the discrepancy between our set of institutional measures and the 'true' concept of institutions that such measures would like to capture. This could affect both the left- and right-hand sides. Here we ignore the less severe consequences of error from the 'left' (which inflates the standard errors of the estimates, without major consequences in our case), concentrating on the potentially more severe consequences of measurement error from the 'right'.

We assume that (only) the initial level of institutional quality is observed with noise, such that $G_{i0} = G^{*}_{i0} + e$. If the noise can be approximated by classic errors in variables assumption (i.e., measurement error is uncorrelated with the true variable we would like to observe), this is a source of *attenuation bias* in the OLS estimates of a regression of G_{iT} on G_{i0} (with or without the conditioning variables). In turn, this will lead to an overestimate of the speed of convergence in (1) and (2), implying that our estimates could be optimistic. This is a common problem in the empirical literature on convergence (Temple 1998).

Table 4: Convergence in institutional quality under measurement error, Two-Stage Least Squares estimates

Panel (a): Unconditional convergence				
	Fraser Institute measures, 1985-2010 growth	ICRG measures, 1985-2010 growth		
	Legal system and property rights, 1985-2010	Bureaucratic quality	Rule of law	Corruption in government
Initial value	-0.003***	-0.005***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.022***	0.035***	0.032***	0.014***
	(0.004)	(0.005)	(0.003)	(0.005)
F-stat	24.794***	53.938***	82.523***	23.354***
R-Sq.	0.250	0.423	0.422	0.275
Obs.	90	104	104	104
RMSE	0.011	0.021	0.015	0.017
1st stage F-stat	178.020***	2754.378***	3041.672***	4241.212***
Panel (b): Conditional convergence				
	Fraser Institute measures, 1985-2010 growth	ICRG measures, 1985-2010 growth		
	Legal system and property rights	Bureaucratic quality	Rule of law	Corruption in government
Initial value	-0.007***	-0.010***	-0.008***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.028*	0.049	0.043*	0.032
	(0.014)	(0.031)	(0.022)	(0.051)
F-stat	9.125***	11.075***	15.949***	8.710***
R-Sq.	0.660	0.706	0.728	0.588
Obs.	77	84	84	84
RMSE	0.009	0.018	0.012	0.015
1st stage F-stat	63.421***	401.197***	458.442***	390.648***

Notes: the dependent variable is the average annual growth rate of each institutional measure. Instruments: 1980 value of *Quality of Legal system and property rights* and the 1984 value of each of the ICRG measures. Symbols *, ** and *** stand for significant at 10, 5 and 1% respectively, two-tailed test. Heteroskedasticity-Robust Standard errors are in parentheses. Each conditional convergence regression controls for the initial value of: per capita GDP (natural log), secondary enrolment rate, *Polity2* index, regional dummies (Latin America, Asia, Sub-Saharan Africa, Middle East and North Africa and transition economies), legal origins dummies (French, German, Scandinavian and Socialist systems), latitude, ethnic fractionalisation and share of major religions (Catholic, Muslim and other major religions).

To give an appreciation of how severe the impact of measurement error could be, we instrument G_{i0} with its most recent lagged value (although that such exercise implies using a reduction in the sample size). Table 4 reports the results. Instrumental variables regressions show that convergence rate estimates are smaller in magnitude, but this is not severe.

4.6 Convergence tests using alternative institutional measures

In addition to the core measures used so far, we have tested for convergence also using other indices. These are popular variables in the empirical literature on institutions (e.g. Hall and Jones 1999, Acemoglu, Johnson and Robinson 2001 and Rodrik, Subramanian and Trebbi 2004), but provide a much shorter view of the historical evolution of institutions.

In particular, we use two further variables from the ICRG database (see Knack and Keefer 1995) covering the 1985-1997 period, after which they have been discontinued. They are indicators of quality of the contracting environment: *government repudiation of contracts* and the *expropriation risk*. We also utilized data from the World Governance Indicators (WGIs) by the World Bank (2011a). These are all subjective measures, with the most extensive country coverage, aggregating the ratings from over thirty organizations observed over 1996-2010 in the explicit attempt to reduce measurement error. Higher scores indicate better ratings. Four such measures proxy for aspects of legal and administrative institutional quality: *rule of law*, *regulatory quality*, *government effectiveness*, and *control of corruption*.

Table 5: Convergence in institutional quality: using additional measures

Panel (a): Unconditional convergence						
	World Governance Indicators, 1996-2010 growth				ICRG measures, 1985-1997 growth	
	Government effectiveness	Rule of law	Control of Corruption	Regulatory quality	Expropriation risk	Government repudiation of contracts
Initial value	-0.002	-0.004	-0.005***	-0.008**	-0.011***	-0.011***
	(0.001)	(0.003)	(0.002)	(0.004)	(0.001)	(0.002)
Constant	0.003	0.008	0.011**	0.018	0.103***	0.092***
	(0.004)	(0.008)	(0.005)	(0.012)	(0.007)	(0.011)
F-stat	1.495	2.176	2.113	3.971**	139.862***	47.555***
Adj. R-Sq.	0.001	0.023	0.064	0.046	0.614	0.342
Obs.	179	168	152	174	124	124
RMSE	0.018	0.023	0.019	0.030	0.018	0.031
Panel (b): Conditional convergence						
	World Governance Indicators, 1996-2010 growth				ICRG measures, 1985-1997 growth	
	Government effectiveness	Rule of law	Control of Corruption	Regulatory quality	Expropriation risk	Government repudiation of contracts
Initial value	-0.012***	-0.014***	-0.018***	-0.022***	-0.014***	-0.017***
	(0.003)	(0.003)	(0.004)	(0.005)	(0.001)	(0.002)
Constant	-0.042*	-0.060*	-0.029	-0.032	0.117***	0.038
	(0.023)	(0.032)	(0.042)	(0.039)	(0.025)	(0.042)
F-stat	4.631***	2.943***	3.092***	5.796***	72.630***	23.585***
Adj. R-Sq.	0.196	0.178	0.239	0.326	0.785	0.682
Obs.	128	127	118	127	97	97
RMSE	0.013	0.016	0.017	0.021	0.013	0.019

Notes: the dependent variable is the average annual growth rate of each institutional measure. Symbols *, ** and *** stand for significant at 10, 5 and 1% respectively, two-tailed test. Heteroskedasticity-Robust Standard errors are in parentheses. Each conditional convergence regression controls for the initial value of: per capita GDP (natural log), secondary enrolment rate, *Polity2* index, regional dummies (Latin America, Asia, Sub-Saharan Africa, Middle East and North Africa and transition economies), legal origins dummies (French, German,

Scandinavian and Socialist systems), latitude, ethnic fractionalisation and share of major religions (Catholic, Muslim and other major religions).

Despite the data under scrutiny this time cover just over a decade, the results in table 5 suggest that the evidence of convergence is robust to alternative measures. However, while for ICRG measures this is true in all regressions, the WGIs measures hardly show any evidence of unconditional convergence in two cases.

4.7 Pre- and post-Cold War: has the speed of convergence changed over time?

As illustrated in section 2, it is possible that the convergence process may have changed pace since the 1990s. The mutated conditions of international politics, following the end of the Cold War, and the ensuing change in the approach to development policy, with the spread of Washington Consensus and its emphasis on institutional reforms, could have started a process of institutional change fostering convergence. The corresponding testable hypothesis is that the speed of convergence has accelerated over time, which is equivalent to testing if the speed of convergence β has been constant or has accelerated since the 1990s.

We do this by reinvestigating conditional and unconditional convergence with panel methods. An unbalanced panel with N>T is formed by dividing the period under scrutiny into five-year episodes, starting at the beginning of the earliest available period (e.g., 1985-1989, 1990-1995 and so on). Since the Cold War ended approximately in 1990, such temporal structure can capture whether the speed of convergence was faster in the period immediately following the end of the Cold War as compared to the preceding historical period.[5] A test equation for institutional quality convergence in such setting is:

$$g_{it} = \alpha + \lambda_t + \alpha_i + \beta_1 G_{it0} + \sum_{t=2}^{T} \beta_t \cdot \lambda_t G_{it0} + \varepsilon_{it} \qquad (3)$$

[5] The end of the Cold War as a state of political and military tension between the USA and the USSR dates back to 3rd December 1989, when the American and Soviet leaders declared its end at the Malta Summit. However, the USSR officially dissolved on 25th December 1991.

The dependent variable in this case is the average annualized growth rate in institutional quality over each of the five-year episodes and G_{it0} is its initial value. The term α_i captures countries' fixed effects. The symbol λ_t represents the time effects capturing common shocks, and the 1985-1989 period is the omitted category to separate the post-Cold War period from the historical conditions preceding this period. This is effectively a Difference-in-Differences approach. The interaction between the time dummies (minus the benchmark one) and the initial level of institutions allows testing for differences in the convergence parameter across time periods. According to (3), the sign and magnitude of the effect of initial institutional quality on its subsequent growth depends on the historical period. Hence, the partial effect will be $\beta_1 + \beta_j \lambda_j$. Because a panel approach can account for countries' fixed effects, this exercise responds also to the concern that estimates of conditional convergence may be downward biased if initial institutional quality is positively correlated to country-specific persistent characteristics allowing certain countries to have high-quality institutions (e.g., state history and organization, political culture and tradition).

Table 6 presents Pooled OLS and Fixed Effects estimates for our four core measures. By construction, Fixed Effects regressions are always a test of conditional convergence, as they condition on all time-invariant factors. Pooled OLS regressions, instead, are used to test for unconditional convergence if they do not control for any countries' structural characteristics. When they do, then Pooled OLS is used as a useful benchmark against their Fixed Effects counterpart to assess the bias in the convergence parameter due to country-specific persistent characteristics (e.g., Rodrik 2013).

In line with our expectations, Pooled OLS estimates unambiguously confirm the trend of unconditional convergence. However, regressions including the interaction terms indicate that there has been much stronger convergence for 1990-1995, which testifies of the impact

of the end of the Cold War. However, the other discernible trend is that there is no evidence of stronger convergence in more recent five-periods. This is surprising because we expected the spread of the Washington Consensus to facilitate the adoption of higher quality institutions and therefore catch-up.

Table 6: Conditional and unconditional convergence in institutions, five-year panel estimation

Panel (a):	***Quality of Legal System and Property Rights***				***Bureaucratic Quality***			
	Conditional convergence		Unconditional convergence		Conditional convergence		Unconditional convergence	
	Fixed Effects	Pooled OLS	Pooled OLS	Pooled OLS	Fixed Effects	Pooled OLS	Pooled OLS	Pooled OLS
Initial value	-0.023***	-0.013***	-0.008***	-0.004**	-0.021***	-0.012***	-0.006***	-0.004**
	(0.003)	(0.002)	(0.001)	(0.002)	(0.004)	(0.003)	(0.001)	(0.002)
Initial value * 1990-1995 dummy	-0.011***	-0.012***		-0.012***	-0.007*	-0.006		-0.006*
	(0.003)	(0.003)		(0.003)	(0.004)	(0.005)		(0.004)
Initial value * 1995-2000 dummy	0.002	0.001		0.005**	-0.009**	-0.005		-0.003
	(0.002)	(0.002)		(0.002)	(0.004)	(0.004)		(0.003)
Initial value * 2000-2005 dummy	-0.002	-0.003		0.000	-0.007**	-0.001		0.002
	(0.002)	(0.002)		(0.002)	(0.003)	(0.003)		(0.002)
Initial value * 2005-2010 dummy	-0.000	-0.003		0.000	-0.008**	-0.000		0.002
	(0.003)	(0.002)		(0.002)	(0.004)	(0.004)		(0.002)
Constant	0.094	0.022	0.049***	0.028**	-0.324	0.035	0.035***	0.030*
	(0.067)	(0.025)	(0.006)	(0.011)	(0.234)	(0.033)	(0.006)	(0.015)
F-stat	29.832***	18.905***	63.463***	20.399***	17.227***	5.886***	35.980***	5.881***
R-Squared	0.515	0.393	0.125	0.284	0.288	0.139	0.065	0.086
Obs.	673	669	796	796	535	528	662	662
Countries	128	126	139	139	127	125	142	142
RMSE	0.029	0.034	0.041	0.037	0.054	0.063	0.064	0.063
Time dummies	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Controls	Yes	Yes	No	No	Yes	Yes	No	No
Panel (b):	***Rule of Law***				***Control of Corruption***			
	Conditional convergence		Unconditional convergence		Conditional convergence		Unconditional convergence	
	Fixed Effects	Pooled OLS	Pooled OLS	Pooled OLS	Fixed Effects	Pooled OLS	Pooled OLS	Pooled OLS
Initial value	-0.012***	-0.006***	-0.009***	-0.002	-0.023***	-0.012***	-0.010***	-0.005**
	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Initial value * 1990-1995 dummy	-0.022***	-0.022***		-0.021***	-0.012**	-0.009		-0.015**
	(0.003)	(0.003)		(0.003)	(0.006)	(0.006)		(0.006)
Initial value * 1995-2000 dummy	-0.005*	-0.003		-0.001	-0.007*	-0.003		-0.003
	(0.003)	(0.003)		(0.002)	(0.004)	(0.003)		(0.004)
Initial value * 2000-2005 dummy	-0.007**	-0.003		-0.001	-0.010***	-0.006*		-0.004
	(0.003)	(0.003)		(0.002)	(0.003)	(0.003)		(0.003)
Initial value * 2005-2010 dummy	-0.005*	-0.002		0.001	-0.011**	-0.005		-0.001
	(0.003)	(0.003)		(0.002)	(0.004)	(0.004)		(0.003)
Constant	0.105	0.010	0.065***	0.007	0.105	0.010	0.065***	0.007
	(0.112)	(0.033)	(0.007)	(0.011)	(0.112)	(0.033)	(0.007)	(0.011)
F-stat	38.061***	15.280***	84.401***	30.152***	26.941***	10.439***	35.659***	16.946***
R-Squared	0.570	0.498	0.131	0.431	0.411	0.284	0.093	0.219
Obs.	535	528	662	662	535	528	662	662
Countries	127	125	142	142	127	125	142	142
RMSE	0.039	0.046	0.060	0.049	0.047	0.055	0.068	0.063
Time dummies	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Controls	Yes	Yes	No	No	Yes	Yes	No	No

Notes: the dependent variable is the average five-year growth rate of each index. Within R-squared in Fixed Effects regressions and the Adjusted R-squared in Pooled OLS measure goodness of fit. Controls include the initial value of: per capita GDP (natural log), secondary enrolment rate, *Polity2* index, regional dummies (Latin America, Asia, Sub-Saharan Africa, Middle East and North Africa and transition economies), legal origins dummies (French, German, Scandinavian and Socialist systems), latitude, ethnic fractionalisation and share of major religions (Catholic, Muslin and other major religions). Symbols *, ** and *** stand for significant at 10, 5 and 1% respectively, two-tailed test. Standard errors, in parentheses, are robust for arbitrary heteroskedasticity and clustering at the country level.

On the other hand, Fixed Effects regressions show evidence of stronger conditional convergence in all periods after 1990, apart from one case. Moreover, the general trend in

Fixed Effects regressions is to show stronger conditional convergence than previously seen in cross-section estimates. The comparison with their Pooled OLS counterpart suggests that without conditioning on country-specific persistent characteristics would result in substantive underestimation of conditional convergence. But can we rely on Fixed Effects estimates to express the 'true' conditional convergence rate? They seem suspiciously large in magnitude, because of the concomitant role of two forces.

First, since the dependent variable has its principal variation in time (rather than across countries), while all the important variation in the explanatory variable is across countries, Fixed Effects estimates may be shoehorning the data on growth in institutional quality and its initial level into a spurious relationship with each other.[6] In particular, conditioning out country fixed effects may overestimate, in magnitude, the impact of initial conditions.[7] Second, since panel convergence regressions are a reparameterisation of a dynamic panel model linking final level of institutional quality to its initial value, it is known in the convergence and panel econometrics literature that Fixed Effects regressions tend to overestimate the convergence rate, unless the time dimension tends to be large (Barro 2012). The above discussion implies that the "true" value of the conditional convergence parameters lies somewhere between Fixed Effects estimates, which tend to overestimate it and so represent the "upper bound", and Pooled OLS estimates, which are biased toward zero due to omitted time-invariant variables. Both are useful reference points.

[6] For example, the proportion of the total variation in the initial value of the *Bureaucratic Quality* index due to the *between* variation is 76 per cent and the same proportion of total variation of its growth rate is, instead, 11 per cent. Similarly, the fraction of total variation in the initial value of the *Quality of Property Rights and Legal System* index due to the variation across countries is 65 per cent, while for its growth rate is 10 per cent. The other measures show the same patterns.

[7] Quah (2003) first raised similar issues in the context of the literature on inequality and growth. This is a special case of spurious regression that econometric theory has now begun to formalise (Choi 2013).

4.8 Discussion

Cross-section and panel convergence regressions find evidence of conditional and unconditional convergence over the 1970-2010 period in measures of legal, administrative and bureaucratic institutional quality, as well as the quality of the contracting environment and the enforcement of private property rights. Such results do not depend on the performance of specific regions in the developing world or of the transition economies. They hold also when accounting for measurement error and are robust to checks for outliers and influential observations. Such findings suggest that institutions may converge regardless of economies initial conditions. However, this seems a rather slow process. The conditional convergence estimates suggest that sharing the same structural characteristics could significantly enhance the institutional 'catch-up' amongst economies.

What are the implications for institutional change? The convergence regressions generally show and quantify to what extent institutions are persistent. The prediction seems to be that countries having high-quality institutions in the years to come would be roughly the same as today. This goes against the tenet of the New Institutional Economics, where superior institutional arrangements replace less efficient ones. Instead, the view put forward by Acemoglu and Robinson (2006, 2008) that institutions, even when inefficient, may be kept in place as they serve the interests of influential minorities, tends to be supported by our results.

Institutions may also change as a result of epochal historical events, for example, as argued in Acemoglu et al. (2001). Being the end of the Cold War one such event, the evidence presented here is consistent with the conjecture that the ensuing wave of institutional reforms in the developing world has accelerated the convergence process, in order to mimic institutions maximizing market freedom and private property that are typically found in Anglo-American countries (Chang 2011). However, the acceleration in

convergence has been a short-lived effect, and seems to have quickly slowed down or disappeared in the new millennium. This weakening of convergence in recent periods, instead, seems compatible with the view that "institutional mono-cropping", as adoption of Western-style institutions in the South, may not have been as successful as expected due to developing economies-specific constraints (Berkowitz et al., 2003; Roland, 2004; Rodrik, 2008; Khan, 2012; Chang, 2007).

From the econometric point of view, the cross-country regressions presented here are a first pass to understand the evolution of institutional quality around the world. Such results should be interpreted as empirical regularities, which are nonetheless robust, and perhaps constitute a useful base for further research. Our approach relied on the concept of *β-convergence*, where cross-section and panel convergence regressions aim at capturing mean reversion phenomena in institutions. However, some literature has emphasized a different statistical notion of convergence (e.g., Quah, 1993), i.e., *α-convergence*, which looks at whether the cross-sectional dispersion across countries is decreasing. It can be shown that *β-convergence* is a necessary, but not sufficient, condition for *α-convergence* (e.g., Sala-i-Martin 1996). While future research could perhaps focus also on α-convergence, here we incidentally note that the decline in cross-sectional dispersion illustrated in section 2 already provides some evidence consistent with the notion of *α-convergence* (and with our regressions). Nonetheless, the focus of this paper remains on whether initial conditions matter for differences in institutional quality across countries, what Sala-i-Martin (1996) defines as 'classical convergence' in the context of national income convergence. This is a question on mean reversion and it is interesting in itself. Knowing whether institutional quality in poor economies would catch up with that of rich economies could have repercussions on current disparities in income and on other development outcomes.

5. Conclusions

This paper is concerned with the evolution and change of institutions across countries and over time. We ask whether contemporary differences in the quality of institutions between countries are becoming wider or are narrowing. Neither the theoretical nor the previous empirical literature provide clear guidance on whether we would expect the institutions of low-income countries to converge to those of high-income countries. So we let the data speak for themselves and address whether we observe institutional 'catch-up' across the world by presenting cross-section and panel data tests of convergence on a wide array of institutional measures.

The results suggest that developing economies experienced improvements in institutional quality, reducing the gap with advanced economies. We find persuasive evidence for conditional convergence in institutions from the 1980s (or even the 1970s) to 2010. There is a significant negative correlation between the initial institutional quality measure and its and the subsequent change in the index in countries with similar structural characteristics such as the initial levels of income, human capital, and political democracy, as well as similar social and cultural characteristics. Convergence regressions also find evidence of unconditional convergence, implying that initial conditions are irrelevant for differences in institutional quality, but it is a rather slow catch-up process. Hence, differences in institutional quality between countries may be transitory, but are going to persist for a long time.

The change in the evolution of international politics since the 1980s may be a key factor explaining the observed convergence process. The political and economic systems of many countries have increasingly favored institutions that restrict arbitrary actions of rulers and bureaucrats and have become increasingly based on market freedom (e.g., Huntington

(1991) documents the advancement of political democracy). Indeed, we find that there is persuasive evidence of a positive effect of the end of the Cold War on institutional quality convergence. But this effect was temporary and had weakened considerably in the new millennium, although it not clear why.

Our findings suggest that efficiency enhancing better quality institutions may not necessarily supplant weak institutions in developing countries, and that institutions are path dependent as has been argued by historical institutionalists (Mahoney 2000). It is more likely that where extractive economic and political institutions exist, ruling elites may not act to replace them with more inclusive, better quality institutions if it is not in their interest to do so (Acemoglu and Robinson 2012). Theoretically, it is also possible to conjecture that institutional diversity around the world may be the outcome of a mutually self-reinforcing equilibrium where the existence of a set of institutions in one part of the world may need the existence of a different set of institutions elsewhere (Acemoglu, Robinson and Verdier 2012).

Whatever the reasons for the observed institutional diversity across the world, the relative lack of convergence in institutional quality since the mid 1990s suggests the lack of absolute convergence in per capita incomes observed in the twentieth century (Pritchett, 1997) may well persist for some time to come in the twenty-first century.

References

Acemoglu, Daron (2009). *Introduction to Modern Economic Growth*. Princeton: Princeton University Press.

Acemoglu, Daron (2003). Why not a political Coase theorem? Social conflict, commitment and politics. *Journal of Comparative Economics*, 31: 620–652.

Acemoglu, Daron and James A. Robinson (2012). *Why Nations Fail: The Origins of Power, Prosperity and Poverty*. London: Profile Books.

Acemoglu, Daron and James A. Robinson (2008). Persistence of power, elites and institutions. *The American Economic Review*, 98: 267-293.

Acemoglu, Daron and James A. Robinson (2006). *De Facto* political power and institutional persistence. *The American Economic Review*, 96: 325-330.

Acemoglu, Daron, Johnson, Simon and James A. Robinson (2001). The colonial origins of comparative development: an empirical investigation. *The American Economic Review*, 91: 1369-1401.

Acemoglu, Daron, James A. Robinson and ThierryVerdier (2012) "Can't We All Be More Like Scandinavians? Asymmetric Growth and Institutions in an Interdependent World", *MIT Department of Economics Working Paper No. 12-22*

Bardhan, Pranab (2005). Institutions matter, but which ones?. *Economics of Transition*, 13(3): 499-532.

Barro R.J. (2012), "Convergence and Modernization Revisited", *NBER Working Paper 18295.*

Berkowitz D., Pistor K. and Richard J-F. (2003) "Economic Development, Legality, and the Transplant Effect", *European Economic Review*, 47: 165-195.

Besley, Timothy and Torsten Persson (2011). *Pillars of Prosperity: The Political Economics of Development Clusters*. Princeton: Princeton University Press.

Bruno G., De Bonis R. and Silvestrini A. (2012) "Do Financial Systems Converge? New Evidence From Financial Assets in OECD Countries", *Journal of Comparative Economics*, 40: 141-155.

Canning D. (2012) "Progress in Health Around the World", *Journal of Developemnt Studies*, 48(12): 1784-1798

Chang, Ha-Joon (2011). "Institutions and economic development: Theory, Policy and History". *Journal of Institutional Economics*, 7(4): 473–498.

Chang, Ha-Joon (2007). Understanding the relationship between institutions and economic development, in Chang, Ha-Joon (ed.), *Institutional Change and Economic Development*, New York: United Nations University Press: 17-34.

Choi, Imai (2013). Spurious fixed effects regression. *Oxford Bulletin of Economics and Statistics*, 75(2): 297-306.

Deaton A. (2004) Health in an Age of Globalization, *Brookings Trade Forum 2004*, Brookings Institution Press, pp.83-130.

Djankov, Simeon, Glaeser, Edward, La Porta, Rafael, Lopez-de-Silanes, Florencio and Andrei Shleifer (2003). The new comparative economics. *Journal of Comparative Economics*, 31: 595–619.

Evans, Peter (2004). Development as institutional change: the pitfalls of monocropping and the potentials of deliberation. *Studies in Comparative International Development*, 38(4): 30-52.

Gwartney, James G. and Robert A. Lawson (2007). *Economic freedom of the world: 2007 annual report*. Vancouver: Fraser Institute. Available at www.freetheworld.com.

Haggard, Stephen and Lydia Tiede (2012). The rule of law and economic growth: where are we?. *World Development*, 39(5): 673-685.

Hall, Robert and Charles I. Jones (1999). Why do some countries produce so much output per worker than others?. *Quarterly Journal of Economics*, 114: 83-116.

Huntington, Samuel, 1991, *The Third Wave: Democratization in the Late Twentieth Century* (Norman: University of Oklahoma Press).

ICRG (2012). *"International Country Risk Guide Researchers Dataset, Table 3B"*. The Political Risk Services Group, third edition.

Kapur, D. and R. Webber (2000), 'Governance-related Conditionalities of the IFIs', G-24 Discussion Paper Series, no. 6, Geneva: UNCTAD.

Khan, Mustaq (2012). Governance and growth: history, ideology and methods of proof, in Noman, Akbar, Botchwey, Kwesi, Stein, Howard and Joseph Stiglitz (eds.), *Good growth and governance in Africa*, Oxford: Oxford University Press: 51-79.

Khanna T., Kogan J. and Palepu K. (2006) "Globalization and Similarities in corporate Governance: A Cross-Country Analysis", *Review of Economics and Statistics*, 88(1): 69-90

Keefer P. and Knack S. (1997) "Why Don't poor Countries Catch Up? A Cross-National Test of an Institutional Explanation", *Economic Inquiry*, 35: 590-602.

Knack S. (1996) "Institutions and the Convergence Hypothesis: The Cross-National Evidence", *Public Choice*, 87: 207-228

Knack, Stephen and Philip Keefer (1995). Institutions and economic performance: cross-country tests using alternative institutional measures. *Economics and Politics*, 7(3): 207–228.

La Porta, Rafael, Lopez-de-Silanes, Florencio and Andrei Shleifer (2008). The economic consequences of legal origins. *Journal of Economic Literature*, 46(2): 285-332.

La Porta, R., Lopez-de-Silanes, F., Andrei S. and Vishny R. (1999). The quality of government. *Journal of Law Economics and Organization*, 15 (1): 222-279.

Mahoney, James (2000), "Path Dependence in Historical Sociology", Theory and Society 29:4, pp. 507–548.

Mkandawire, Thandika (2012). Institutional monocropping and monotasking in Africa, in Noman, Akbar, Botchwey, Kwesi, Stein, Howard and Joseph Stiglitz (eds.), *Good growth and governance in Africa*, Oxford: Oxford University Press: 80-113.

Paldam, Martin and Erich Gundlach (2008). Two Views on Institutions and Development: The Grand Transition vs the Primacy of Institutions, *Kyklos*. 60(1): 65–100.

Pritchett, Lant (1997). Divergence, big time. *Journal of Economic Perspective*, 11(3): 3-17.

Quah, Danny (2003). One third of the world's growth and inequality, in Eicher, Theo and Stephen J. Turnovsky (eds), *Growth and Inequality: Issues and Policy Implications*, Cambridge: MIT Press: 27–58.

Quah, Danny (1993). Galton's Fallacy and tests of the convergence hypothesis. *Scandinavian Journal of Economics*, 95: 427–443.

Ravallion M. (2012) "Why Don't We See Poverty Convergence", *American Economic Review*, 102(1): 504-523.

Ravallion M. (2003) "Inequality Convergence", *Economics Letters*, 80: 351-356.

Rodrik D. (2013), "Unconditional Convergence in Manufacturing", *Quarterly Journal of Economics, 128(1): 165-204.*

Rodrik D. (2011), "The Future of Economic Convergence", *NBER Working Paper 17400.*

Rodrik, Dani (2008). Second-best institutions. *American Economic Review: Papers & Proceedings*, 98(2): 100–104.

Rodrik, Dani, Subramanian, Arvind and Francesco Trebbi (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, 91:131–165.

Roland, Gérard (2004). Understanding institutional change: fast-moving and slow-moving institutions. *Studies in Comparative International Development*, 38(4): 109-131.

Sala-i-Martin, Xavier X. (1996). The classical approach to convergence analysis. *The Economic Journal*, 106(437): 1019-36.

Savoia A., Easaw J., McKay A. (2010) "Inequality, Democracy, and Institutions: A Critical Review of Recent Research." *World Development* 38, no. 2: 142-154

Simensen, Jarle, 1999, "Democracy and Globalization: Nineteen Eighty-Nine and the 'Third Wave'" *Journal of World History* 10 (2), pp. 391–411.

Sonin, Konstantin (2003). Why the rich may prefer poor protection of property rights. *Journal of Comparative Economics*, 31: 715–731.

Stiglitz, Joseph (1998). Broader goals and more instruments: towards the post-Washington consensus, *UNU-WIDER Annual Lecture*, Helsinki.

Temple, J. R. W. (1998), Robustness tests of the augmented Solow model. J. Appl. Econ., 13: 361–375.

Williamson, Oliver E. (1996). *The Mechanisms of Governance*. New York, Oxford: Oxford University Press.

World Bank (2011a). *Worldwide Governance Indicators (WGI) project*. Available at: http://info.worldbank.org/governance/wgi/index.asp.

World Bank (2011b) *World Development Indicators 2011*, http://data.worldbank.org/data-catalog/world-development-indicators.

APPENDIX

Table A1: List of countries

Developing economies	Madagascar MDG	Germany DEU
Angola AGO	Maldives MDV	Denmark DNK
United Arab Emirates ARE	Mexico MEX	Spain ESP
Argentina ARG	Mali MLI	Finland FIN
Burundi BDI	Myanmar MMR	France FRA
Benin BEN	Mongolia MNG	United Kingdom GBR
Burkina Faso BFA	Mozambique MOZ	Greece GRC
Bangladesh BGD	Mauritania MRT	Hong Kong HKG
Bahrain BHR	Mauritius MUS	Ireland IRL
Bahamas BHS	Malawi MWI	Iceland ISL
Belize BLZ	Malaysia MYS	Israel ISR
Bolivia BOL	Namibia NAM	Italy ITA
Brazil BRA	Niger NER	Japan JPN
Bhutan BTN	Nigeria NGA	Korea KOR
Botswana BWA	Nicaragua NIC	Luxemburg LUX
Central African Republic CAF	Nepal NPL	Malta MLT
Chile CHL	Oman OMN	Netherlands NLD
Ivory Coast CIV	Pakistan PAK	Norway NOR
Cameroon CMR	Panama PAN	New Zealand NZL
Congo COG	Peru PER	Portugal PRT
Colombia COL	Philippines PHL	Singapore SGP
Comoros COM	Papua New Guinea PNG	Sweden SWE
Cape Verde CPV	Paraguay PRY	Taiwan TWN
Costa Rica CRI	Qatar QAT	United States USA
Cuba CUB	Rwanda RWA	**Transition economies**
Djibouti DJI	Saudi Arabia SAU	Albania ALB
Dominica DMA	Sudan SDN	Armenia ARM
Dominican Republic DOM	Senegal SEN	Azerbaijan AZE
Algeria DZA	Solomon islands SLB	Bulgaria BGR
Ecuador ECU	Sierra Leone SLE	Bosnia-Herzegovina BIH
Egypt EGY	El Salvador SLV	Belarus BLR
Eritrea ERI	Sao Tome and Principe STP	China CHN
Ethiopia ETH	Suriname SUR	Czech Rep. CZE
Fiji FJI	Swaziland SWZ	Estonia EST
Gabon GAB	Seychelles SYC	Georgia GEO
Ghana GHA	Syria SYR	Croatia HRV
Guinea GIN	Chad TCD	Hungary HUN
Gambia GMB	Togo TGO	Kazakhstan KAZ
Guinea-Bissau GNB	Thailand THA	Kirghizstan KGZ
Equatorial Guinea GNQ	Tonga TON	Cambodia KHM
Grenada GRD	Trinidad and Tobago TTO	Laos LAO
Guatemala GTM	Tunisia TUN	Lithuania LTU
Guyana GUY	Turkey TUR	Latvia LVA
Honduras HND	Tanzania TZA	Moldova MDA
Haiti HTI	Uganda UGA	Macedonia MKD
Indonesia IDN	Uruguay URY	Poland POL
India IND	St. Vincent & Grenadine VCT	North Korea PRK
Iran IRN	Venezuela VEN	Romania ROM
Jamaica JAM	Vanuatu VUT	Russia RUS
Jordan JOR	Yemen YEM	Slovak Rep. SVK
Kenya KEN	South Africa ZAF	Slovenia SVN
Kiribati KIR	Zambia ZMB	Tajikistan TJK
St. Kitts & Nevis KNA	Zimbabwe ZWE	Ukraine UKR
Kuwait KWT	**Advanced economies**	Uzbekistan UZB
Lebanon LBN	Australia AUS	Vietnam VNM
Libya LBY	Austria AUT	
St. Lucia LCA	Belgium BEL	
Sri Lanka LKA	Canada CAN	
Lesotho LSO	Switzerland CHE	
Morocco MAR	Cyprus CYP	

Table A2: Definition of the variables

Panel (a): Fraser Institute (Gwartney and Lawson 2007)	
Quality of Legal System and Security of Property Rights	This variable includes: **(a)** Judicial independence: the judiciary is independent and not subject to interference by the government or parties in dispute. This component is from the *Global Competitiveness Report*'s question: "Is the judiciary in your country independent from political influences of members of government, citizens, or firms? No—heavily influenced (=1) or Yes—entirely independent (=7)." Source: World Economic Forum, *Global Competitiveness Report* (various issues), at http://www.weforum.org/en/initiatives/gcp/index.htm. **(b)** Impartial courts: a trusted legal framework exists for private businesses to challenge the legality of government actions or regulation. This component is from the *Global Competitiveness Report*'s question: "The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations is inefficient and subject to manipulation (=1) or is efficient and follows a clear, neutral process (=7)." **(c)** Protection of property rights. This component is from the *Global Competitiveness Report*'s question: "Property rights, including over financial assets are poorly defined and not protected by law (=1) or are clearly defined and well protected by law (=7)." **(d)** Military interference in the rule of law and the political process (from ICRG); this component is based on the *International Country Risk Guide*'s *Military in Politics*: "In the short term a military regime may provide a new stability and thus reduce business risks. However, in the longer term the risk will almost certainly rise, partly because the system of governance will be become corrupt and partly because the continuation of such a government is likely to create an armed opposition." Source: PRS Group, *International Country Risk Guide* (various issues), http://www.prsgroup.com/ICRG.aspx. **(e)** Rule of law (from ICRG, see above): it is defined as *integrity of the legal system*, i.e., strength and impartiality of the legal system and popular observance of the law. **(f)** Legal enforcement of contracts. This component is based on the World Bank's *Doing Business* estimates for the time and money required to collect a clear-cut debt. The debt is assumed to equal 200% of the country's per-capita income where the plaintiff has complied with the contract and judicial judgment is rendered in his favor. Source: World Bank, *Doing Business* (various issues), http://www.doingbusiness.org/. **(g)** Regulatory restrictions on the sale of real property. This sub-component is based on the World Bank's *Doing Business* data on the time and monetary costs required to transfer ownership of property that includes land and a warehouse. Source: World Bank, *Doing Business* (various issues),http://www.doingbusiness.org/.
Panel (b): ICRG measures (ICRG 2012)	
Bureaucratic quality	High scores indicate "an established mechanism for recruitment and training," "autonomy from political pressure," and "strength and expertise to govern without drastic changes in policy or interruptions in government services" when governments change.
Rule of law	This variable, also known as 'Law and Order Tradition', "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes." Higher scores indicate: "sound political institutions, a strong court system, and provisions for an orderly succession of power." Lower scores indicate: "a tradition of depending on physical force or illegal means to settle claims." Upon changes in government new leaders "may be less likely to accept the obligations of the previous regime."
Corruption in government	Lower scores indicate "high government officials are likely to demand special payments" and that "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, police protection, or loans."
Expropriation risk	The full name is "Risk of expropriation of private investment". This variables evaluates the risk "outright confiscation and forced nationalization" of property. Lower ratings "are given to countries where expropriation of private foreign investment is a likely event."
Government repudiation of contracts	The full name is "Risk of Repudiation of Contracts by Government". "This indicator addresses the possibility that foreign businesses, contractors, and consultants face the risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down" due to "an income drop, budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities." Lower scores signify "a greater likelihood that a country will modify or repudiate a contract with a foreign business."
Panel (c): World Governance Indicators (World Bank 2001)	
Government effectiveness	This variable captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Rule of law	This variable captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Control of Corruption	This variable captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
Regulatory quality	This variable captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.