

Berggren, Niclas; Bergh, Andreas; Bjørnskov, Christian

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## **The growth effects of institutional instability**

**Niclas Berggren · Andreas Bergh · Christian Bjørnskov<sup>□</sup>**

**Abstract** Both institutional quality and institutional stability have been argued to stimulate economic growth. But to improve institutional quality, a country must endure a period of institutional change, which implies at least a little and possibly a lot of institutional instability. We investigate the growth effects of institutional quality and instability, using the political risk index from the ICRG in a cross-country study of 132 countries, measuring instability as the coefficient of variation. Using the aggregate index, we find evidence that institutional quality is positively linked to growth. While institutional instability is negatively related to growth in the baseline case, there are indications that the effect can be positive in rich countries, suggesting that institutional reform is not necessarily costly even during a transition period. Sensitivity analysis, e.g., decomposing the political risk index by using both its constituting components and the results of a principal components analysis, using other measures of institutional quality and excluding outliers, confirm the general results, with qualifications.

**Keywords** Institutions · Instability · Growth · Transaction costs · Uncertainty

**JEL Classifications** B52 · D80 · O11 · O17 · O43

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N. Berggren  
The Ratio Institute, P.O. Box 3203, SE-103 64, Stockholm, Sweden  
e-mail: [niclas.berggren@ratio.se](mailto:niclas.berggren@ratio.se)

A. Bergh  
The Ratio Institute, P.O. Box 3203, SE-103 64 Stockholm, Sweden; and Department of Economics, Lund University  
e-mail: [andreas.bergh@ratio.se](mailto:andreas.bergh@ratio.se)

C. Bjørnskov  
Aarhus School of Business, Aarhus University, Department of Economics, Frichshuset, Hermodsvej 22, DK-8230 Åbyhøj, Denmark  
phone: +45 894 86181 fax: +45 894 86197  
e-mail: [chbj@asb.dk](mailto:chbj@asb.dk)

## 1 Introduction

In recent years, a large number of studies provide substantial evidence that the quality of formal institutions is an important determinant of economic growth.<sup>1</sup> At one end of the literature, Rodrik et al. (2004) even go so far as to claim that “institutions rule”, i.e, that institutional quality trumps other determinants of growth, while other studies indicate that not all types of institutions are equally conducive to growth and that factors such as human capital are also important (Glaeser et al. 2004; Acemoglu et al. 2005).

The main reason to expect institutional quality to affect growth positively is that it entails decreased transaction costs through reduced uncertainty of economic transactions and productivity-enhancing incentives. As North (1990, p. 110) puts it: “Third World countries are poor because the institutional constraints define a set of payoffs to political/economic activity that do not encourage productive activity.”

However, to improve institutional quality, a country in general has to go through a series of institutional reforms and thereby a period of institutional instability.<sup>2</sup> While high-quality institutions are growth-enhancing because they reduce uncertainty and transaction costs and entail incentives for productive behaviour, the effects of institutional change *per se* and the ensuing instability are theoretically ambiguous. Instability that entails change conducive to growth in the long run may come with transitional costs of a size that hampers growth in the short run. On the other hand, institutional change may also reflect optimal adjustments to changing circumstances, in which case stability would be associated with institutional sclerosis and lower growth (cf. Olson 1982).

Unless institutional instability is entirely inconsequential, one will get a better estimate of the growth effects of institutional quality compared to previous studies when controlling for institutional instability. Simultaneously, one needs to take into account if the instability occurs around stable long-run levels or are accompanied by institutional trends. Against this background, we investigate how institutional quality and institutional instability each affect growth rates, something that has not to our knowledge been done before. We do this by analyzing 132 countries over four five-year periods from 1984 to 2004, using annual data from the political risk index from the International Country Risk Guide (ICRG). We measure institutional instability as the coefficient of variation in institutional quality.

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<sup>1</sup> See, e.g., Knack and Keefer (1995), Keefer and Knack (1997), de Haan and Siermann (1998), Aron (2000), Berggren (2003), Claessens and Laeven (2003), Glaeser et al. (2004), Acemoglu and Johnson (2005), Acemoglu et al. (2005), Butkiewicz and Yanikkaya (2006) and Doucouliagos and Ulubasoglu (2006).

<sup>2</sup> It should be noted from the outset that we refer to instability on two levels: first, by making clear that any institution reduces uncertainty for economic decision-makers and second, by introducing the notion that any such institution *itself* can be subject to change, which may reduce the uncertainty-reducing effect of the institution in question.

In carrying out the analysis, we use Kendall's Tau to control for the trend in institutional quality during each five-year period. This setup allows us to separate medium-term improvement and deterioration of institutional quality from fluctuations around stable levels, thus testing whether instability has an independent effect when correcting for the trend.

Previous studies that use measures of political (i.e., government or regime) instability generally find a negative relationship with investments or growth.<sup>3</sup> The studies that look at policy instability, mainly at the effects of macroeconomic variation on macroeconomic outcomes, likewise mostly find a negative relationship.<sup>4</sup> Hence, there is a growing body of literature that deals with the growth effects of political instability or the instability of economic policy and/or macroeconomic variables but no studies, to our knowledge, deal specifically with the instability of institutions.

The paper closest to ours is Pitlik (2002), who argues (and finds empirical support), for the idea that volatile liberalization policies depress growth even if the long-run trend is towards overall market-orientation. He tests this by regressing average annual real GDP growth rate between 1975 and 1995 on the difference in economic freedom between the same years, the level of economic freedom in 1975, the standard deviation of economic freedom and the initial GDP level.

While the idea is similar to ours, we argue that our approach is more consistent than Pitlik's. First of all, using average annual growth over 20 years as the dependent variable with no other control variables except those mentioned above raises concerns on how results should be interpreted. Secondly, including both the change in economic freedom and the initial level is econometrically equivalent to using the level of economic freedom at the end of the sample period – and in the absence of perfect stability (which one would obviously not want in such studies) this cannot explain growth over the sample period. This point was clearly made recently by de Haan and Sturm (2006). Thirdly, the economic freedom index is not ideal for testing the idea that instability matters, since the index is available only every fifth year before 2000. As such, our approach captures the within-period instability as well as the overall trend between period ends.

Our approach, a panel based on yearly ICRG-data as a measure of institutional quality, does not suffer from any of these problems. The novelty of our approach thus lies in focusing on *institutions* rather than on the effects of macroeconomic or political instability and in investigating the concurrent growth effects of institutional quality and instability. Our main findings are that institutional quality is positively linked to growth, but that the effect of institutional instability depends on economic development and institutional

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<sup>3</sup> See, e.g., Aizenmann and Marion (1993), Ramey and Ramey (1995), Brunetti and Weder (1998), Abdiweli (2001), De la Escosura and Sanz-Villarroya (2004), Chatterjee and Shukayev (2006), Daude and Stein (2007), Merlevede and Schoors (2007) and Aisen and Veiga (2008).

<sup>4</sup> See, e.g., de Haan and Siermann (1996), Alesina et al. (1996), Hopenhayn and Muniagurria (1996), Pitlik (2002) and Aysan et al. (2007). However, Campos and Nugent (2002) fail to find a negative long-run effect on growth. Cf. de Haan and Siermann (1996), de Haan (2007) and Jong-A-Pin (2009), who among other things stress the need to take into account contextual factors and that different (types of) countries may not conform to the same linear model.

type.<sup>5</sup> In particular, we speculate whether the positive association between institutional instability and growth in some cases is mediated by the ability of actors in an economy to cope with medium-run uncertainty through insurance and financial markets.

The paper is structured as follows. In the next section, we present some brief theoretical considerations and hypotheses about the relationship between institutional quality and instability, on the one hand, and growth, on the other. Next, we describe our empirical strategy and the data are introduced. In section four, we present our main results using the aggregate index and using a set of indices derived by principal components analysis. In section five, we perform some additional robustness tests by controlling for other institutional indices and outliers. Here we also discuss and attempt to handle potential reverse causality problems. Section six concludes.

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<sup>5</sup> As for negative growth effects of changes that improve institutional quality, several other studies have found evidence that there are transition costs after reforms have been undertaken – see, e.g., Bailamoune-Lutz and Addison (2007), Bjørnskov and Kurrild-Klitgaard (2008) and Méon et al. (2009).

## 2 Theoretical considerations

As in most work on institutions, we take the work of Douglass North as our starting point. North (1990, pp. 6, 83–84) states:

The major role of institutions in a society is to reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction. The overall stability of an institutional framework makes complex exchange possible across both time and space. ... [T]his set of stability features in no way guarantees that the institutions relied upon are efficient, although stability may be a necessary condition for human interaction, it is certainly not a sufficient condition for efficiency.

Along these lines, we define *institutional quality* as the degree to which institutions reduce uncertainty for economic decision-makers and offer incentives for productive behavior. Higher certainty implies lower transaction costs, which makes economic projects more profitable in expectation and hence more likely to be undertaken. By offering incentives for productive behavior, efficient institutions stimulate individuals to engage in actions where the private return is close to the social return (Demsetz 1967). The two effects, reducing uncertainty and providing efficient incentives, are, in our view, jointly necessary and sufficient for institutional quality.

Higher certainty and incentives for productive behavior may arise on the basis of many institutional characteristics, not least those relating to the protection of private property rights. Some examples of such characteristics are: generality (that equals are treated equally), transparency in public decision-making, accountability in public decision-making and, importantly, an expectation that the institutions will be properly implemented and enforced. We expect people, in such a setting, to be relatively willing to engage in economic transactions, as they think that if instances of opportunism and cheating by others occur, the offenders will be punished and hence be less likely in the first place to engage in such treacherous behaviour.<sup>6</sup> Thus, by giving political and economic actors incentives to behave honestly and predictably, high quality institutions help ensure that consequences of economic undertakings are more easily foreseen and that incentives stimulate productive rather than unproductive behavior (cf. Baumol 1990). Although we do not claim that this list of the theoretical possibilities is exhaustive, mechanisms like these are, we suggest, plausible for explaining why institutional quality can have a positive effect on growth.

What can be said about the relationship between growth and institutional change and instability?<sup>7</sup> We will argue that this relation is theoretically ambiguous. On the one hand, based on the reasoning above, one

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<sup>6</sup> See Rothstein (2000, pp. 491–492). On the potential for formal institutions to induce trust in others, see Berggren and Jordahl (2006). However, Knack (2002) and Bjørnskov (2007) provide indications to the effect that trust creates institutional quality.

<sup>7</sup> We differentiate between institutional instability and institutional change. Institutional change necessarily entails institutional instability (by definition), but a given change in quality between two points in time may be associated with different fluctuations

would expect a negative effect from the mere fact that change and instability increase uncertainty.<sup>8</sup> As such, institutional change, even when in a positive direction, could entail transitional costs that lower growth in the short run. While a negative effect is to be expected if the change entails reduced institutional quality, even instability occurring due to institutional improvements may entail short-run costs due to J-curve-like costs arising from uncertainty in a period where confidence in institutional innovations is built. In addition, institutional improvements releasing a period of instability often entail the removal of privileges to some groups in society, which induces short-run costs when resources are re-allocated to more productive uses.

On the other hand, at least two other theoretical mechanisms suggest a *positive* link between institutional change/instability and growth: Weakened interest groups and institutional experimentation. First, Olson (1982) stresses that instability may diminish the influence of interest groups, especially if they are well-established, and if these groups have contributed to maintaining low-quality institutions in what may in some cases be termed “institutional sclerosis”, institutional instability that changes the political power balance could therefore be beneficial for growth over time. Coates et al. (2008) provide recent evidence for this type of mechanism. Second, Hayek (1978) and Knight and Johnson (2007) could be taken to suggest that since it is difficult to know how to design optimal institutions, a process of institutional experimentation, where different institutional set-ups are tried and compared, may yield superior economic outcomes. Noting that the economic environment continuously changes, such piecemeal experimentation could often reflect optimal institutional adjustments. This entails change and instability but may result in higher institutional quality and, on net, higher growth rates.

These considerations connect to a theoretical literature on the relationship between uncertainty and investments, which tends to find the relationship ambiguous. The result depends on several factors, such as the type of risk, the degree of risk aversion among investors, if markets are complete or incomplete and if investments are irreversible or not – see Hartman (1972), Woroch (1988), Craine (1989), and Ferderer (1993).<sup>9</sup> In the same vein, Ramey and Ramey (1995, pp. 1138–1139) acknowledge that volatility can affect growth in both a negative and positive way – negatively if there are irreversibilities in investment, which makes payoffs on investments more uncertain; and positively, if there is a choice between low-volatility, high-expected-returns technologies and low-volatility, low-expected returns technologies; or if higher volatility induces more precautionary savings, which may stimulate investment.<sup>10</sup> This type of economic uncertainty could also be argued to have its roots in institutional instability.

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during the period of change and hence with different degrees of institutional instability. In the empirical section, when investigating the effect of instability, we therefore control for change by including the trend in institutional quality.

<sup>8</sup> We are, in essence, talking about stability on two levels. Institutional quality entails stability for economic decision-makers; institutional stability entails *stability in the institutional quality* that entails stability for economic decision-makers and, thereby, reinforces the stability already expected to be conducive to growth.

<sup>9</sup> The latter, however, also conducts an empirical analysis, suggesting that higher risk decreases investment spending.

<sup>10</sup> Lucas (1987) posits, as a third position, that growth and business-cycle fluctuations are unrelated.

In addition, we note that institutional instability, even though measured consistently across countries, may not mean the same thing in poor and rich countries – that it may not reflect politically similar developments or have the same sources. As such, there is no reason to expect similar effects of institutional instability in poor and rich countries. It could be that institutional instability in developing countries reflects deeper sources of instability, while institutional instability in developed countries are more likely to reflect beneficial institutional adjustment and experimentation.

Summarizing, this set of theoretical considerations based on the existing literature leads us to the expectation that institutional quality is unequivocally positively related to growth. However, the short-to-medium run effects of institutional change and the instability it entails are theoretically ambiguous by being associated with both uncertainty and transitional costs but also with positive institutional adjustments to changing environments, institutional experimentation and learning from such adjustments and experimentation. The nature of the relationship must be settled empirically.

### **3 Data and empirical method**

#### **3.1 The main data**

As institutional indicators, we use data from the International Country Risk Guide (ICRG), which consists of three indices measuring political risk, economic risk and financial risk. We only use the political risk index, which is composed of 12 underlying components listed in Table 1.<sup>11</sup> The reason is that we wish to focus on institutions, whereas the other two indices mainly measure economic outcomes, such as international GDP ranking, inflation, foreign debt and current account balance. Basing institutional assessments on such outcome-oriented measures (as, e.g., Huther and Shah, 1998), one risks being plagued by the fact that the expectations of economic actors regarding the future are clearly influenced by economic outcomes in the past. As noted by Rodrik (2007, p. 188): “[I]nvestors are likely to rate institutional quality high when the economy is doing well, regardless of whether causality goes one way or the other.” Even though the political risk index is partly based on subjective assessments, using this index only, we hope to reduce the inherent endogeneity problem as it does not include any direct measures of economic performance. We therefore also

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<sup>11</sup> Note that while the name of the index implies that a higher value is associated with higher risk, and hence lower institutional quality, the opposite scale holds. I.e., the index is inversely related to political risk. Appendix A outlines the specific elements in the 12 components.



think that measuring institutional instability with this index is superior to trying to gauge the growth effects of direct measures of economic outcome instability.<sup>12</sup>

*Insert Table 1 here*

Our choice of institutional measure is meant to fit the theoretical discussion above. Notably, what is rated as high-quality institutions are in many cases institutions that increase stability and reduce uncertainty. This is clearly reflected in components A, C, I and L, while components B, D, E, G, H and J measure various types of (potential) conflicts and tensions in society. Again, high institutional quality can be expected to have positive effects on growth, but its variation has ambiguous effects. Component F has clear theoretical implications: corruption increases transaction costs and introduces discrepancies between private and social returns. Varying levels of corruption adds to this an element of uncertainty, with expected negative growth effects. Finally, component K measures if the country is a democracy, an autarchy or something in between. Here, neither theory nor empirics is clear: democracies are not necessarily expected to grow faster than non-democracies.<sup>13</sup>

To sum up, we expect the level of all of the components with the possible exception of component K to have a positive effect on growth, while we cannot have unambiguous expectations of how variations (the change and the instability) in the components affect growth.<sup>14</sup> In Tables A1 and A2 of Appendix B, descriptive statistics for and definitions of all variables used can be found.

The main points of our strategy are illustrated in Fig. 1, where we plot the scores of legal quality for Denmark, Malaysia, the United States and Venezuela. First, Danish legal quality has been high and very stable across the entire period 1984–2004, while American legal quality has been of almost the same quality, but as the figure illustrates, somewhat more volatile. Simply comparing quality at the beginning of the period may therefore give a slightly biased impression of actual institutional performance in the two countries, although the differences may seem relatively minor. Second, comparing Malaysia and Venezuela accentuates this point as the two countries had almost equal legal quality around 1990.

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<sup>12</sup> A remaining possible source of endogeneity is that government stability and socioeconomic conditions improve as a result of growth, while simultaneously explaining variations in growth performance between countries.

<sup>13</sup> See, e.g., Barro (1996), showing a weak negative effect of democracy on growth, Doucougliagos and Ulubasoglu (2008) suggests a small positive effect, and Acemoglu et al. (2008), showing that the relationship between income and democracy is probably not causal. Specific to our aim of this paper, Przeworski and Limongi (1993) stress that autocracies may be better at reaching and implementing efficient decisions on policy and institutional reform without having to consider pressure from special-interest groups or short-term voter considerations (see also Bjørnskov and Kurrild-Klitgaard 2008).

<sup>14</sup> Measuring the medium-run instability of partially subjective indicators could offer a benefit as year-to-year changes of such indices tend to be a mix of real changes and inherent uncertainty of the actual status of the country in a given year. As such, the instability of the ICRG measures reflects institutional uncertainty that market actors face on the same terms as the professional evaluations of the ICRG.

*Insert Fig. 1 here*

The legal quality of the Venezuelan system has, on the other hand, been less stable than its Malaysian counterpart across the entire period and has obviously been characterized by a long-run downward trend. Yet, if either the initial level of 1990 or the average is used, one is likely to overestimate the positive impact of Venezuela's legal institutions compared to Malaysia, a disparity reflected in the difference between the Venezuelan average annual growth rate during 1984-2004 of -0.36 percent and the Malaysian average of 3.2 percent in the same period. Likewise, comparing the instability of the institutions of the two countries can be misleading as Malaysia has seen instability around a relatively stable long-run level while the instability of Venezuelan institutions is a reflection of a steady deterioration. One therefore ideally has to take into account both the level and the trend of the quality of such institutions in order to get a full estimate of the institutional impact.

### 3.2 Estimation strategy

We estimate regressions as in equation 1, where  $Gr$  is the growth rate of real GDP per capita,  $X$  is a set of standard controls,  $Q$  is institutional quality,  $CV_Q$  is the coefficient of variation of  $Q$ ,  $D$  are time- and country-fixed effects and  $\varepsilon$  is a noise term. In further analysis, we expand the specification to equation 2 where we add Kendall's Tau as a measure of the institutional trend,  $TR_Q$  as specified in equation 2.<sup>15</sup>

$$Gr = \alpha + \beta X + \gamma Q + \delta CV_Q + D + \varepsilon \quad (1)$$

$$Gr = \alpha + \beta X + \gamma Q + \delta CV_Q + \varphi TR_Q + D + \varepsilon \quad (2)$$

The control variables in our specification are kept to a minimum of factors that are broadly used in growth studies. In all regressions, the  $X$  vector consists of the logarithm of initial GDP per capita to account for conditional convergence, government expenditures as percent of total GDP, openness (imports plus exports as percent of total GDP), and the investment share of GDP. As such, we capture the most important

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<sup>15</sup> Kendall's Tau is a non-parametric trends measure calculated as the sum of changes between any points within a five-year period. Positive changes are given the value 1, negative -1 and pairs with the same institutional value 0. This means that Kendall's Tau will be smaller if an institutional trend only occurs between, e.g., the first two years of a period, in which case we would also expect a smaller impact across the entire five-year period. As such, using this measure also makes our estimates less sensitive to the particular choice of periods as the measure is smaller if changes are distributed partially across two five-year periods. The measure is also insensitive to missing observations, including starting and ending points.

determinants of economic growth while still keeping the specification sufficiently parsimonious to include a large and diverse set of countries (in line with Barro 1997).

Our full sample covers 132 countries with a political risk rating in at least one of the four time periods 1984-1989, 1989-1994, 1994-1999 and 1999-2004; the countries are listed in Table A3 of Appendix B. As such, growth is measured as the five-year average, as is investments, government expenditures and openness to trade. 40 of these countries have a GDP per capita above 14,000 USD, which we define as our high-income subsample for which determinants of growth and institutional impacts may differ from the full sample (cf. Keefer and Knack 1995 and de Haan and Siermann 1996).

#### **4 Institutions and growth: empirical results**

Using the data described above, we derive a series of fixed effects generalized least squares estimates. Results are reported for the full sample and for two sub-samples of countries with a GDP per capita below and above 14,000 USD, respectively. This corresponds to dividing the sample into a big group (n=100) of poor and middle-income countries and a smaller group (n=40) of rich countries (including the OECD and equally rich countries). We split the sample as citizens and market actors in high-income countries have access to more complete insurance markets, financial instruments in deeper markets as well as better market information, and are therefore substantially better suited to handle institutional instability without real losses in the short to medium run.<sup>16</sup>

##### **4.1 Results using the aggregate political risk index**

The results of employing the aggregate political risk index from the ICRG as the measure of institutional quality are reported in Table 2. First of all, the estimates confirm a number of standard findings: openness to trade and investments are positively associated with growth in both the full sample as well as in the two subsamples. Investments, however, are more important in relatively poor countries in absolute terms, consistent with the notion that input growth becomes less important as economies evolve, while the relative effects of a standard deviation change of the investment rate are similar across levels of development, reflecting that even though the point estimate is smaller in more developed economies, so is the variation in investment rates. The statistical insignificance of government expenditures in the full sample most likely

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<sup>16</sup> We experimented with splitting our sample in democratic and semi-democratic countries. However, since the samples split according to economic development and democratic status are remarkably similar, we obtained very similar results, and therefore opted for the more transparent split based on economic development. Results also remain qualitatively the same when choosing a slightly higher or lower threshold.

reflects a positive association in relatively poor societies and a negative association with growth in rich societies (cf. Fölster and Henrekson 2001 and Schaltegger and Torgler 2006). Finally, all estimates indicate conditional convergence at speeds similar to standard results (cf. Barro 1997).<sup>17</sup> As these results are qualitatively and quantitatively similar throughout, with the exception of the positive association of government expenditures in poor countries that turns out to be statistically fragile, we do not report them in the following tables although all control variables are included in all tests.

*Insert Table 2 here*

Institutional quality, as measured by the political risk index (which effectively is a measure of the *absence* of risk), is significantly and positively related to growth, while institutional instability, as measured by the coefficient of variation, has a negative sign but no significant effect on growth. Yet, including instability (not shown) reduces the coefficient on institutional quality by about ten percent. When controlling for the five-year trend, we find that instability is significantly negatively related to growth; moreover the coefficient on institutional quality is further reduced. Together, these results suggest that institutional quality is good for growth, but that institutional instability is costly in a five-year perspective. In addition, the results suggest that institutional improvements (trends) are associated with medium-run costs.

For poor countries, institutional quality appears to be even more important for growth as a one standard deviation increase results in a growth gain of roughly one quarter of a standard deviation, but instability is rather costly. In rich countries, quality and instability are not significant. A likely explanation for this could in principle be that most rich countries in our sample have very high quality and low instability. However, the institutional trend is negatively related to growth in rich countries as well, and an alternative explanation for the non-result might be that only a smaller number of parts of the political risk index are associated with growth for rich countries.<sup>18</sup>

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<sup>17</sup> Interestingly, excluding the initial GDP per capita renders most measures of institutional quality insignificant. As such, one could interpret these and other results in the literature on institutions and growth as suggestive of club convergence in institutional clubs (Galor 1996).

<sup>18</sup> Furthermore, when excluding the investment rate, as suggested by de Haan and Siermann (1996, p. 342), the institutional coefficients do not change much. We therefore find no evidence of institutional quality, instability or change affecting economic growth through the investment rate and consequently interpret our findings as evidence of the importance of institutions for total factor productivity.

## 4.2 Results using principal components analysis

Aron (2000, p. 115) stresses the importance of using institutional measures carefully as many studies in the growth literature employ an “often-arbitrary aggregation of different components” when forming institutional indices. First, such indices are based on the rather strong assumption that one can aggregate a set of subindices, such as the 12 indices entering the full political risk index, into one, *unidimensional* index, i.e., aggregation assumes that the set of subindices only contains one institutional dimension. Second, even if the first assumption can be defended, most resulting indices effectively assume that all subindices are equally important, i.e., that an aggregation scheme with equal weights is valid. A well-known problem with so-called “kitchen sink” indices like the political risk index therefore arises, as estimates are likely to be biased if some of the components entering the index are associated with an outcome variables while others are not, in which case both inherent problems are likely to bias the point estimate towards zero. To remedy this problem, we use principal components analysis (PCA) to probe deeper into the data variation.

This approach has two advantages. First, by using PCA we let the structure of the data determine how components are pooled to form separate indices instead of forcing a specific organization on the data. Second, the principal components are by construction orthogonal, which means that we do not encounter problems of testing partially correlated indices against each other but can separate types of institutions without such statistical problems. We calculate the coefficients of variation of the resulting principal components within each five-year period using the variation of the 12 political risk index components weighted by the same scheme as in the PCA scores of institutional quality. As such, we therefore also allow the heterogeneity of the instability inherent in the data to determine our indicators.

The results of the principal components analysis are reported in Table 3.

*Insert Table 3 here*

The table shows that the 12 components of the political risk index do not load onto a single factor but split quite nicely into three underlying dimensions explaining approximately 70 percent of the variation of the original data. Given that the constituting components of the political risk index derive from dichotomous data, the precision of the PCA must probably be deemed satisfactory. Although one of the main potential difficulties with PCA is the interpretation of the results we believe that the analysis yields a set of indices that can readily be interpreted as indices of “legal quality”, “policy quality” and “social tensions”; the basis for this interpretation is presented in Appendix C.<sup>19</sup>

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<sup>19</sup> In the following, we use the component solution, rotated to form three orthogonal components. As such, we base our analyses on the implicit assumption that separating the institutional factors perfectly is a valid strategy, an assumption which could of course be questioned. However, further analysis with the same data in Toft (2008) strongly suggests that allowing for even large amounts of

Before going to the regressions, we note that the PCA indices can be used to illustrate the potential pitfalls of not treating institutional quality as a multifaceted concept, and the need to separate quality and instability. To take an example, Denmark receives the second-largest score in the latest period for legal quality and is the fifth-most stable country in that area. However, it is only number 71 in terms of the quality of policy and number 80 in terms of social tensions, and receives relatively unstable scores on both these dimensions, placed at number 50 and 71, respectively. Panama, on the other hand, is placed at number 52 on the legal dimension but has the seventh-most stable legal environment. These countries exemplify how quality and stability are only imperfectly associated: the correlation between legal quality and legal instability is -0.50, that between policy quality and policy instability is -0.61, and that between the level of social tensions and its stability is -0.40.

The regression results, linking the three institutional features to growth, are presented in Table 4. Using the three indices from the PCA increases the explanatory power of the specification substantially –  $R^2$  is consistently higher in this table than in any previous tests – and it provides more detailed results.<sup>20</sup>

*Insert Table 4 here*

In terms of the level of institutional quality, the findings rather clearly point towards the importance of the first two dimensions, especially the first one, for growth in the full sample. We have interpreted these as a legal quality dimension and a policy quality dimension. In the subsample consisting of low and middle-income countries, these two dimensions are roughly of equal importance, as a one standard deviation change of each is associated with a growth increase of approximately 1.3 percentage points (roughly the difference between present day quality in Jordan and Lithuania in legal quality, and between Serbia and India in policy quality), all other things being equal. However, in the high-income subsample, only the legal quality component is statistically significantly associated with growth, and with an even larger coefficient, which indicates that a one standard deviation change to legal institutions in rich countries (the difference between present day Spain and Norway) is associated with an increase of growth of approximately 72 percent of a standard deviation, or 1.6 percentage points, all other things being equal. Compared to the smaller coefficients, and in particular the insignificant relation between growth and the full political risk index in Table 2, this exercise clearly emphasizes the risks of using overly aggregated kitchen-sink indices.

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obliqueness when rotating components leaves the results virtually unchanged. Furthermore, the solution is robust to excluding either one of the 12 components, i.e. single questionable indicators do not matter, and remain qualitatively the same when we restrict the PCA to one of our two subsamples.

<sup>20</sup> Two countries (the Democratic Republic of Congo and Sudan) leave the sample when we apply the PCA scores as they consistently lack data on specific components of the political risk index.

Regarding institutional instability and the trend, these seem to matter mostly in rich countries. A positive sign for the CV coefficients implies support for Olson's (1982) concern with excessive stability, whereas a negative sign implies a negative effect of increased transaction costs due to a rise in uncertainty. In poor countries, the instability of policy quality is negatively related to growth; in the rich countries, the instability of legal quality and policy quality are positively, while the instability of social tensions is negatively, related to growth. The associations between institutional instability and growth are also of economic significance. For example, a one standard deviation increase of legal instability in rich countries, roughly the difference between extremely stable Finland and Belgium, is associated with a improvement in the growth rate of about one third of a standard deviation. Conversely, a one standard deviation change in the instability of social tensions, the difference between present-day Denmark and Austria, is associated with a growth decline of almost one half of a standard deviation.

Furthermore, the trend in policy quality exhibits a significantly positive association with growth, indicating that such changes have short-run effects whereas the long-run level of policy quality is of no significant relevance in developed countries. The trend in social tensions is, in contrast, negatively related to growth. Calculating the average transitional gain of a positive trend in policy quality through a five-year period from the present estimates suggests that they approximate 200 USD per capita per year. The similar medium-run costs of improving institutions related to social tensions are approximately 90 USD per capita, averaged across a five-year period. As such, the results suggest that improvements in the policy dimension in rich countries seem to be associated with higher growth, although only through a short run activity effect, while improvements in the social tensions dimension may even be *costly* in terms of growth although the actual costs seem negligible.

We devote the next section to exploring the robustness of these results.

## 5 Robustness tests

First, we test whether the main results are robust to including the level and coefficient of variation of four alternative indicators of institutional quality: the Gastil index of political rights and civil liberties, Henisz's (2002) "Political Constraints V" indicator of veto player strength, the Polity IV index of democracy, and the Herfindahl index of the legislature as an index of the level of political competition; Table A2 in Appendix B provides further information on sources and definitions. As such, by including alternative indicators with established interpretations we test whether our results simply proxy for effects of, e.g., democracy or constraints on policy-makers, although we also note that the simultaneous inclusion of alternative institutional measures most likely causes some variance inflation. We also test what happens when potential outlier observations are removed from the sample and whether the results are robust to excluding the

observations with the best and worst institutions. Lastly, we try to see whether there are signs of endogeneity. All tests are performed for the political risk index and the three indices derived by PCA; specifics are reported in appendices.

First, the results obtained using the political risk index are relatively robust to including other institutional indicators, especially in the case of poor countries, as can be seen when comparing Tables A4 and A5 of Appendix B with columns 4 and 6 of Table 2. In poor countries, eight out of 12 coefficients (three for each of the four indices) have the same sign and statistical significance as before. For the rich countries, the results are more sensitive, as only three out of 12 coefficients have the same sign and statistical significance as before. In poor countries, institutional quality as measured by the political risk index always has a significantly positive effect on growth, and the same holds for rich countries, except when the Gastil index is included. A similar pattern holds for institutional instability as measured by the coefficient of variation, but the trend more rarely obtains statistical significance. Whenever the alternative indicators are significant, institutional quality is good for growth, while institutional instability is costly.

Testing instead for outlier influences, we verify that the results are not driven by such observations, defined as observations with a residual of more than  $\pm 1.5$  standard deviations. These tests simply reconfirm the main results in Table 2. We therefore note that the results of employing the political risk index are relatively robust, including the “non-result” that overall institutional quality appears inconsequential in relatively rich countries. Excluding the ten percent of observations in the tails of the distribution of political risk, and thereby testing whether the results are driven by extreme observations, yields similar results with the exception that the effects of political risk in poor countries becomes insignificant.

We perform the same type of robustness analysis for the setting using the PCA-derived indices – see Tables A6 and A7 of Appendix B and compare with columns 4 and 6 of Table 4. For the poor countries, out of 36 coefficients (nine for each of the four indices), 25 have the same sign and statistical significance as before. For the rich countries, the corresponding figure is 20 out of 36, implying less robustness although we should stress that the problems of inflation variance when including multiple institutional indicators may be particularly acute in this sample. The result that only legal quality is significant in rich countries while both legal and policy quality are significant in poor countries also turns out to be robust when excluding outliers, as do the results pertaining to instability and institutional trends. As such, the tables show that most main findings are largely robust to including the quality and coefficient of variation of the Gastil index, the Political Constraints V index, the Polity IV index and the Herfindahl index.<sup>21</sup> The most important difference is that the policy quality trend does not attain statistical significance. Contrary to the results using the simple

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<sup>21</sup> When adding the Polity IV index of democracy in the specification with the three PCA dimensions, the results for the Polity index are probably a result of a few outlier observations, as only six countries in this subsample have seen any changes: Bahrain, Oman and Kuwait that are oil-countries, and Israel, France and South Korea. As such, this result does not generalize.



political risk index, these estimates do not seem to be driven by extreme observations as the estimates are stable to excluding the tails of the distribution of institutional quality.

Further robustness tests consisting in excluding single regions and countries with few observations in general reconfirm the main results. In the full sample, the effect of the political risk index proves to be sensitive to including African countries: if they are excluded, it fails the 10 percent level of significance. In the poor sample, the effect of the political risk trends disappears when excluding Asian countries, while in the rich sample, no result associated with the political risk index is robust to this exercise. Using the PCA indices instead, the effect of the instability of policy quality fails significance when excluding observations from either the post-communist countries, Sub-Saharan Africa, the Middle East and North African region, Asia or countries with less than three observations in the dataset. What is more, excluding the Sub-Saharan African countries – i.e., the absolutely poorest countries in the sample – yields the legal quality index insignificant.

As our last exercise, we try to control for possible endogeneity and simultaneity in two ways. As is almost always the case, we note that the institutional measures may lag rather than lead growth rates for several reasons. First, simple arguments could be made why institutions might improve when the economy grows. For example, the quality of legal systems and public bureaucracies could be constrained by available resources, in which case growth would lead to better institutions by alleviating this constraint. Second, we note the risk when using subjective or quasi-subjective indices that evaluations of institutional quality are affected by expectations of economic growth in the immediate future. If these expectations are on average correct, higher growth rates in the short run would simply be reflected in our measures of institutional quality instead of causing actual quality. In this case, we would expect this reflection to show up in higher investment rates to the extent that the expectations are shared by the market.

To investigate causality in a tentative way, we first include lagged growth rates, based on the simple argument that if higher growth rates cause rather than follow higher institutional quality and affect institutional stability, including the lagged dependent variable would pick up at least some of this effect. The estimates, which we report in Table A8 in Appendix D, in general do not suggest that endogeneity is a major concern. Using the full political risk index, we note that while the estimates in the full sample and the rich sub-sample are unchanged and leave the lagged growth rate insignificant, the inclusion of lagged growth in the poor sub-sample turns out to be significant and renders the political risk trend insignificant. Employing the three institutional factors derived by principal components analysis again provides a better fit and yields the main findings somewhat less affected. In the full sample, we find no significant differences although the point estimates of trends in policy quality and social tensions are slightly smaller. The results in the rich sub-sample are entirely unaffected while the instability of policy quality in the poor sub-sample is rendered insignificant. With few exceptions, this exercise therefore does not suggest major endogeneity problems. With respect to the possibility that our estimates suffer from simultaneity bias due to institutional indices

reflecting market expectations, the exclusion of investment rates does not affect our estimates of institutional effects (not shown). Given that such expectations would most likely show up in the investment rate instead of affecting productivity, we do not believe that this is a major worry.

Our second test is an attempt to instrument for our variables of interest. We must note that, as is often the case, our search for valid instrumental variables that account for the variation of institutional quality and instability over time has proven to be unsuccessful. What variation could best be explained by any instrumental variables proved to be lagged measures of institutional quality derived from PCA and lagged growth rates. We therefore report estimates using random effects with and without our instrumental variables and focus only on the results that are qualitatively similar across both random and fixed effects estimates.

The results reported in Table A9 in Appendix D nonetheless suggest that our main estimates are causal, insofar as the use of lagged values of institutional quality and lagged growth are valid. In the poor sub-sample, policy quality fails significance while the remaining central results again are approximately the same. As such, while we must emphasize that the strength of these tests is fairly limited, whatever endogeneity test proved practicable with these data do not reject that the main estimates may be causal.<sup>22</sup>

As the main results are relatively robust, especially with regard to the important role of institutional quality, and may cautiously be interpreted as causal, we move on to discussing the implications of the findings in the final section.

## 6 Concluding remarks

The burgeoning literature on economic growth has in recent years documented a close association between institutional quality and how rapidly countries develop economically. However, to achieve high quality of institutions, for example protecting property rights or constraining political decision-making, countries need to go through periods of institutional change and instability. Even among rich countries, some have more volatile institutions than others, yet economic theory provides only ambiguous insights as to how change and instability might affect the economy. While uncertainty about the future institutional framework intuitively would be associated with larger transaction costs and thus be harmful to growth, it could also reflect positive

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<sup>22</sup> It should also be noted that we succeeded to some extent in identifying the variation over time in legal quality in the rich sub-sample with a set of instruments consisting of lagged values of legal and policy quality, lagged growth and the percent of United Nations General Assembly votes in which a country voted with the US in a given five-year period; the latter data are from Voeten (2004). These instruments also passed a Sargan test ( $p < .92$ ) and yielded a significant estimate of 2.499 (standard error 1.122). Alternative tests using urbanization rates and a simple measure of information flows (the number of telephone lines per 100 inhabitants) yielded very similar results. The same instruments only identified a small proportion of the other institutional measures in either sample.

institutional adjustments to shifting circumstances. Likewise, institutional improvements are in the long run going to lead to higher growth but may also imply transitional costs in the short to medium run.

Consequently, this paper has explored the full association between institutional quality, institutional instability, institutional medium-run trends and economic growth. We employ the political risk index from the International Country Risk Guide as well as three indices aggregated from its 12 constituting components by the use of principal components analysis, noting that if aggregated indices hide multiple dimensions, estimates of their effects are likely to suffer a downwards bias. The empirical results rather clearly support a sizeable effect of high-quality institutions on growth in a panel of 132 countries, while the effects of institutional instability and change are in general ambiguous. Employing the three composite indices measuring legal quality, policy quality and social tensions, the results, e.g., indicate that legal quality is conducive to growth in both poor and rich countries, that policy improvements are positively related to growth in rich countries, and that policy instability hampers growth in poor countries. Furthermore, we find that deteriorating social tensions are associated with decline, as is their instability..

However, the results suggest that some instability of legal and policy quality is on average conducive to economic growth in rich countries. Our findings therefore provide more support for the positive effects of institutional adjustment and, more generally, for avoiding Olsonian institutional sclerosis, than for the negative consequences of uncertainty with respect to institutional quality.

## Appendix A

The components of the International Country Risk Guide's political risk index<sup>23</sup>

### A. Government stability

Assesses the government's ability to carry out its declared program(s), and its ability to stay in office. The risk rating assigned is the sum of three subcomponents: Government Unity, Legislative Strength and Popular Support.

### B. Socioeconomic conditions

Assesses the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. There are three subcomponents: Unemployment, Consumer Confidence and Poverty.

### C. Investment profile

Assesses factors affecting the risk to investment that are not covered by other political, economic and financial risk components. *The subcomponents are:* Contract Viability/Expropriation, Profits Repatriation and Payment Delays

### D. Internal conflict

political violence in the country and its actual or potential impact on governance. *The subcomponents are:* Civil War/Coup Threat, Terrorism/Political Violence and Civil Disorder.

### E. External conflict

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<sup>23</sup> A full description can be found at [http://www.prsgroup.com/icrg\\_methodology.aspx](http://www.prsgroup.com/icrg_methodology.aspx)

Assesses the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war).

*The subcomponents are:* War, Cross-Border Conflict and Foreign Pressures

#### F. Corruption

Assesses corruption within the political system. No subcomponents

#### G. Military in politics

Assesses the degree of military participation in politics and the higher level of political risk associated with such interventions. No subcomponents

#### H. Religious tensions

Assesses religious tensions from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process and the suppression of religious freedom. No subcomponents

#### I. Law and order

The Law sub-component is an assessment of the strength and impartiality of the legal system. The Order sub-component is an assessment of popular observance of the law.

#### J. Ethnic tensions

Assesses the degree of tension within a country attributable to racial, nationality, or language divisions.

#### K. Democratic accountability

Assesses how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one. Assessment is done by classifying countries using the following types of governance: Alternating Democracy, Dominated Democracy, De-facto One-Party State, De jure One-Party state, and Autarchy.

#### L. Bureaucracy quality

Assesses the institutional strength and quality of the bureaucracy. Countries that lack the cushioning effect of a strong bureaucracy are considered worse because a change in government can be traumatic in terms of policy formulation and day-to-day administrative functions.

## **Appendix B**

*Insert Tables A1–A7 here*

## **Appendix C**

### Interpreting the PCA indices

One of the potential problems associated with PCA is that the resulting indices can be difficult to interpret. To gain an impression of what the three indices obtained from the PCA actually measure, we therefore explore their correlations with a set of known institutional indicators.

The three resulting indices all correlate with the Gastil index at 0.59, 0.45 and 0.27, respectively, and the Gastil index in turn correlates with the overall political risk index at 0.77.<sup>24</sup> However, focusing on the first dimension suggests a simple interpretation as this dimension loads heavily on Law and order, Democratic accountability, Military in politics, Socioeconomic conditions, Corruption and Bureaucratic quality, all of which either measure the quality and capacity of the legal system or consequences and reflections of such quality and capacity. Furthermore, the correlation between our first dimension and the second area of the Economic Freedom of the World Index (EFI), Legal structure and security of property rights (see Gwartney and Lawson 2007), which is often treated as the most transparent and arguably the “cleanest” measure of the rule of law, is 0.73, making it intuitively sensible to interpret this dimension as a “legal dimension” of institutional quality.<sup>25</sup> It should also be noted that this component is similar to the single governance component extracted through the same method in Seldadyo et al. (2007).

The second dimension includes heavy loadings of countries’ Investment profile and their Government stability. The correlation between this dimension and area five of the EFI, Regulation of credit, labour and business, is 0.42, while the partial correlation, when controlling for area two of the EFI, is 0.34. Adding the two areas of the EFI to the PCA shows that area two exclusively loads onto a factor including the same ICRG components as the first dimension (with a loading of 0.78), which we term a legal dimension, while area five loads moderately onto the first dimension and heavily onto the second dimension (loading 0.63). We therefore interpret the second dimension as a measure of the quality of regulatory policy, in short a “policy dimension”.

Finally, the third dimension consists of heavy loadings of the ICRG components on External and Internal conflict, Religious and Ethnic tensions and Law and order, and correlates at -0.37 with the ethnic diversity index from Alesina et al. (2003). This final index can therefore be interpreted as a measure of both actual and latent conflicts and tensions in society, including socio-political instability and social unrest (cf. Alesina and Perotti 1996). We thus call this dimension “social tensions”.

## **Appendix D**

*Insert Tables A8–A9*

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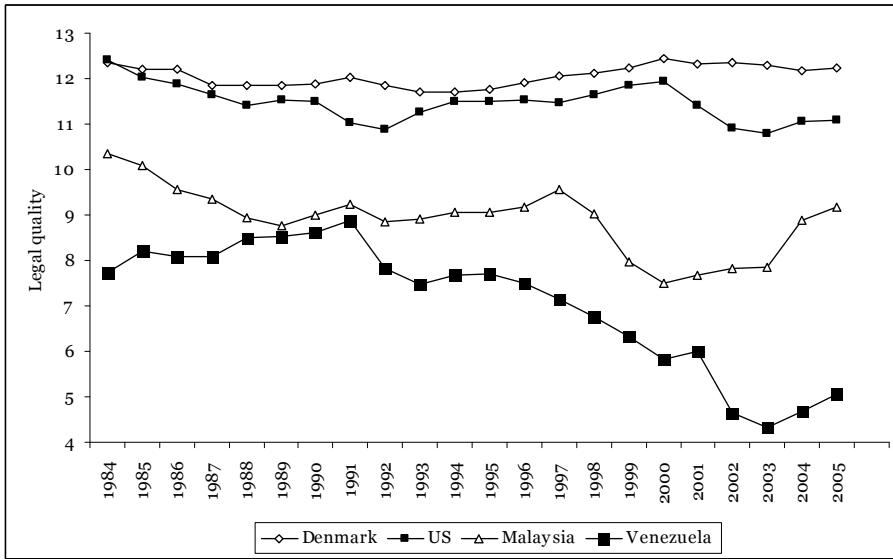
<sup>24</sup> The Gastil index is composed as an average of two subindices, measuring the extent of political rights and the protection of basic civil liberties, both on a scale from one (full rights and liberties) to seven (no rights and liberties). It should be noted that the combined Gastil index is often used as both a measure of democracy and of institutional quality, even though it can be criticized on both counts (cf. Munck and Verkuilen 2002).

<sup>25</sup> An often-used alternative is the Heritage Foundation (2007) index of economic freedom (distributed between one, indicating full freedom, and five, no freedom) although it is only available since 1995. The correlation between the first principal component and the Heritage index is -0.73, indicating the same interpretation.

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**Fig. 1** Legal quality 1984-2004, four examples. *Notes.* For interpretative convenience, we have rescaled indices in this figure to be within the same interval as the original ICRG components.



**Table 1** The components of the political risk index of the ICRG

<b>Components</b>		<b>Components</b>	
A	Government stability	G	Military in politics
B	Socioeconomic conditions	H	Religious tensions
C	Investment profile	I	Law and order
D	Internal conflict	J	Ethnic tensions
E	External conflict	K	Democratic accountability
F	Corruption	L	Bureaucracy quality

**Table 2** Growth effects of institutional quality, instability and trend – using the aggregate political risk index

	All		Poor		Rich	
	1	2	3	4	5	6
Log initial GDP	-7.975*** (.739)	-7.434*** (.729)	-9.361*** (1.078)	-8.693*** (1.055)	-12.147*** (1.308)	-12.114*** (1.284)
Openness	.056*** (.009)	.052*** (.009)	.040*** (.013)	.035*** (.013)	.049*** (.013)	.045*** (.013)
Government share	.014 (.039)	.049 (.038)	.091* (.055)	.149*** (.054)	-.073* (.041)	-.076* (.041)
Investment share	.239*** (.049)	.234*** (.047)	.224*** (.069)	.222*** (.067)	.149*** (.053)	.148*** (.053)
Political risk	.085*** (.025)	.068** (.027)	.114*** (.035)	.090*** (.037)	.051* (.031)	.021 (.033)
CV Political risk	-4.019 (3.968)	-13.021*** (4.459)	-3.948 (4.971)	-14.283** (5.567)	4.684 (6.378)	-1.918 (6.823)
Political risk trend		-3.019** (1.245)		-2.702* (1.481)		-4.588** (1.902)
Observations	469	451	328	311	141	140
Countries	132	132	102	101	40	40
Between R square	.001	.000	.012	.007	.326	.323
Within R square	.348	.368	.349	.378	.656	.676
F statistic	19.44	18.01	12.96	12.13	19.45	18.79
Hausmann test	28.42***	389.24***	85.16***	445.91***	62.39***	40.71***

Notes. \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects.

**Table 3** Principal components analysis: loadings and uniqueness

	1 ("legal")	Component loadings		Uniqueness
		2 ("policy")	3 ("tensions")	
Investment profile	.353	<b>.826</b>	.072	.187
Government stability	-.032	<b>.871</b>	.239	.184
External conflict	.207	.266	<b>.680</b>	.424
Internal conflict	<b>.401</b>	.395	<b>.690</b>	.207
Religious tensions	.227	-.081	<b>.713</b>	.433
Ethnic tensions	.156	.218	<b>.714</b>	.418
Law and order	<b>.610</b>	.339	<b>.459</b>	.303
Democratic accountability	<b>.668</b>	.060	.307	.456
Military in politics	<b>.691</b>	.249	<i>.400</i>	.300
Socioeconomic conditions	<b>.723</b>	<b>.406</b>	-.009	.312
Corruption	<b>.813</b>	-.179	.291	.222
Bureaucracy quality	<b>.874</b>	.215	.133	.172

*Notes.* Loadings in bold are referred to in the text as “heavy” loadings, i.e., the major influences on the PCA scores. Loadings in italics refer to indices with intermediate influence. The component solution has been rotated using the Varimax technique.

**Table 4** Growth effects of institutional quality, instability and trend – using the three PCA indices

	All		Poor		Rich	
	1	2	3	4	5	6
Legal quality	1.204*** (.376)	1.109*** (.380)	1.447*** (.484)	1.375*** (.498)	1.655*** (.537)	1.552*** (.511)
Policy quality	.964*** (.301)	.699** (.318)	1.549*** (.458)	1.339*** (.487)	.639** (.263)	.083 (.296)
Social tensions	.085 (.268)	.150 (.266)	-.095 (.369)	-.099 (.371)	.075 (.343)	.125 (.324)
CV legal quality	3.408 (5.387)	1.867 (5.341)	8.986 (6.574)	6.890 (6.687)	12.248* (7.291)	14.902** (6.982)
CV policy quality	-5.754 (4.639)	-5.916 (4.605)	-10.403* (5.924)	-10.119* (5.950)	12.905** (5.197)	11.815** (4.915)
CV social tensions	-1.188 (5.243)	-.397 (5.231)	-1.975 (6.517)	-.692 (6.629)	-16.954** (7.548)	-24.073*** (7.333)
Legal quality trend		.107 (.263)		.069 (.328)		-.188 (.313)
Policy quality trend		.639*** (.237)		.477 (.322)		.888*** (.236)
Social tensions trend		-.748** (.308)		-.498 (.423)		-.461* (.251)
Observations	457	457	317	317	140	140
Countries	130	130	100	100	40	40
Between R square	.002	.002	.000	.000	.334	.306
Within R square	.377	.399	.403	.411	.767	.802
F statistic	14.64	12.90	10.58	8.78	21.89	21.29
Hausmann test	125.46***	61.88***	64.98***	55.44***	80.89***	21.55

Notes. \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects. Control variables are used throughout but are not reported for reasons of space.

**Table A1** Descriptive statistics

	Mean	Std. dev.	Minimum	Maximum	Obs.
Growth rate	1.545	3.228	-9.746	14.148	469
Log initial GDP	8.614	1.127	6.064	10.709	469
Openness	77.319	77.319	11.298	387.424	484
Government share	21.304	9.048	3.954	64.847	484
Investment share	15.424	8.089	1.336	44.950	484
Q 1	0	1	-2.263	2.168	484
Q 2	0	1	-2.381	2.893	484
Q 3	0	1	-3.466	2.003	484
CV Q 1	.087	.066	0	.347	484
CV Q 2	.105	.069	0	.435	484
CV Q 3	.081	.065	0	.410	484
Q 1 trend	.099	.574	-1	1	484
Q 2 trend	.227	.658	-1	1	484
Q 3 trend	.126	.537	-1	1	484
Gastil index	3.529	1.941	1	7	471
CV Gastil index	.071	.093	0	.615	471
Gastil trend	1.016	.150	.158	1.611	471
Polity IV democracy index	2.889	7.105	-10	10	461
CV Polity IV	.095	1.526	-7.348	25.573	461
Polity trend	.979	2.267	-15.5	40	461
Political constraints V	.136	.313	0	2	469
CV political constraints V	.441	.319	0	.893	469
Constraints trend	.940	.329	-1	2.555	469

**Table A2** Variable definitions

	Definition	Source
Growth rate	Five-year average growth in GDP per capita	Summers et al. (2006)
Log initial GDP	Logarithm to GDP per capita, initial in each five-year period, denoted in purchasing power adjusted 2000 US dollars	Summers et al. (2006)
Openness	Export plus imports as percentage of GDP	Summers et al. (2006)
Government share	Government expenditures, net of all transfers, as percentage of GDP	Summers et al. (2006)
Investment share	Investments as percentage of GDP	Summers et al. (2006)
Q 1	Principal component score, see section 5	Own, based on ICRG
Q 2	Principal component score, see section 5	Own, based on ICRG
Q 3	Principal component score, see section 5	Own, based on ICRG
Gastil index	Index of political rights and civil liberties; lower scores mean stronger protection of rights and liberties	Freedom House (2007)
Polity IV democracy index	Index of three essential elements of democracy: 1) institutions and procedures enabling citizens to freely express their preferences for policies and leaders; 2) effective constraints on the exercise of power by the executive; and 3) the civil liberties of citizens to participate in the political process	Marshall and Jaggers (2004)
Political constraints V	Index employing the same data and logic as Political constraints III, but adding veto points within the judiciary and sub-federal entities	Henisz (2002)
Herfindahl index	Index capturing the degree of formal political competition, calculated as the sum of squares of the share of seats held by any party in parliament	Beck et al. (2008)

**Table A3** Countries included in our sample

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Albania	<i>Greece</i>	Panama
Algeria	Guatemala	Papua New Guinea
Argentina	Guinea	Paraguay
Armenia	Guinea-Bissau	Peru
<i>Australia</i>	Honduras	Philippines
<i>Austria</i>	<i>Hong Kong</i>	Poland
Azerbaijan	Hungary	<i>Portugal</i>
<i>Bahamas</i>	<i>Iceland</i>	<i>Qatar</i>
<i>Bahrain</i>	India	Romania
Bangladesh	Indonesia	Russia
Belarus	Iran	<i>Saudi Arabia</i>
<i>Belgium</i>	Iraq	Senegal
Bolivia	<i>Ireland</i>	Serbia-Montenegro
Botswana	<i>Israel</i>	Sierra Leone
Brazil	<i>Italy</i>	<i>Singapore</i>
<i>Brunei</i>	Jamaica	Slovak Republic
Bulgaria	<i>Japan</i>	<i>Slovenia</i>
Burkina Faso	Jordan	Somalia
Cameroon	Kazakstan	South Africa
<i>Canada</i>	Kenya	<i>South Korea</i>
Chile	<i>Kuwait</i>	<i>Spain</i>
China	Latvia	Sri Lanka
Colombia	Lebanon	Sudan
Congo	Lithuania	Suriname
Congo, DR	<i>Luxembourg</i>	<i>Sweden</i>
Costa Rica	Madagascar	<i>Switzerland</i>
Côte d'Ivoire	Malawi	Syria
Croatia	Malaysia	Tanzania
Cuba	<i>Malta</i>	Thailand
<i>Cyprus</i>	Mexico	Togo
<i>Czech Republic</i>	Moldova	<i>Trinidad &amp; Tobago</i>
<i>Denmark</i>	Mongolia	Tunisia
Dominican Republic	Morocco	Turkey
Ecuador	Mozambique	Uganda
Egypt	Namibia	Ukraine
El Salvador	<i>Netherlands</i>	<i>United Arab Emirates</i>
Estonia	<i>New Zealand</i>	<i>United Kingdom</i>
Ethiopia	Nicaragua	<i>United States</i>
<i>Finland</i>	Niger	Uruguay
<i>France</i>	Nigeria	Venezuela
Gabon	North Korea	Vietnam
Gambia	<i>Norway</i>	Yemen
<i>Germany</i>	<i>Oman</i>	Zambia
Ghana	Pakistan	Zimbabwe

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Notes. Countries in italics are included in the high-income subsample.

**Table A4** Growth effects of institutional quality, instability and trend – using the aggregate political risk index along with alternative institutional indicators

<i>Alternative:</i>	Poor Gastil index	Rich	Poor Political Constraints V	Rich	Poor Polity IV index	Rich
<i>Full baseline included</i>						
Political risk	.098** (.038)	.033 (.035)	.092** (.037)	.097** (.037)	.094*** (.034)	.067* (.036)
CV Political risk	-11.385** (5.747)	-10.079 (7.40)	-13.313** (5.430)	-18.914** (7.692)	-9.358* (5.341)	-18.677** (7.659)
Political risk trend	-1.702 (1.561)	-4.231** (2.018)	-2.993** (1.458)	-1.464 (1.823)	-2.231 (1.429)	-1.366 (1.944)
Alternative index	.030 (.225)	.717 (.680)	-.066 (.608)	-2.428 (3.520)	-.026 (.056)	-3.157*** (.963)
CV alternative	-1.835 (2.316)	1.920 (2.210)	-.5144 (1.101)	-5.669** (2.388)	-.025 (.154)	22.417 (14.614)
Alternative trend	.549 (1.088)	-.749 (2.149)	-.224 (.558)	-6.924** (2.847)	.037 (.059)	50.939*** (15.894)
Observations	307	136	305	130	303	121
Countries	99	39	100	38	99	35
Between R square	.007	.176	.007	.143	.005	.083
Within R square	.371	.706	.366	.769	.355	.776
F statistic	8.84	15.50	8.54	20.29	8.08	19.48
Hausmann test	38.31***	78.86***	206.08***	176.21***	97.80***	163.23***

*Notes.* \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects.



**Table A5** Growth effects of institutional quality, instability and trend – using the aggregate political risk index along with alternative institutional indicators and excluding outliers

<i>Alternative:</i>	Poor	Rich	Poor	Rich	Poor	Rich
	Herfindahl index		No outliers		No tails	
	<i>Full baseline included</i>					
Political risk	.103** (.044)	.135*** (.045)	.094** (.039)	.026 (.033)	.072 (.044)	-.019 (.049)
CV Political risk	-9.931 (6.809)	14.054 (11.453)	-15.249** (5.968)	-.275 (6.878)	-11.315* (6.054)	.176 (8.373)
Political risk trend	-2.613 (1.838)	-3.741 (2.785)	-3.821** (1.601)	-5.498*** (1.947)	-3.037* (1.586)	-6.607*** (2.210)
Alternative index	-1.514 (1.413)	3.659 (2.469)				
CV alternative	-.1876 (1.700)	-2.628 (2.767)				
Alternative trend	-.1275 (1.147)	1.318 (2.029)				
Observations	300	132	267	133	270	124
Countries	100	38	92	39	94	39
Between R square	.229	.019	.045	.374	.000	.325
Within R square	.160	.445	.410	.653	.349	.628
F statistic	2.99	5.49	11.48	15.80	8.89	12.65
Hausmann test	81.20***	8.78	143.24***	22.13**	64.32***	24.86***

*Notes.* \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects.

**Table A6** Growth effects of institutional quality, instability and trend – using the three PCA indices along with alternative institutional indicators

<i>Alternative:</i>	Poor Gastil index	Rich	Poor Political Constraints V	Rich	Poor Polity IV index	Rich
	<i>Full baseline included</i>					
Legal quality	1.502*** (.517)	1.613*** (.543)	1.234** (.497)	1.710*** (.559)	1.321*** (.461)	1.589*** (.559)
Policy quality	1.499*** (.504)	.425 (.329)	1.481*** (.471)	.426 (.325)	1.871*** (.453)	.467 (.360)
Social tensions	-.002 (.416)	.299 (.344)	.178 (.396)	.428 (.351)	-.168 (.376)	.197 (.360)
CV legal quality	8.038 (6.703)	17.153** (7.284)	.762 (6.626)	12.778 (8.653)	7.612 (6.217)	14.617* (8.742)
CV policy quality	-7.819 (6.131)	8.583 (5.652)	-6.991 (5.736)	2.701 (5.984)	-2.690 (5.685)	1.456 (6.176)
CV social tensions	-1.929 (6.706)	-20.099*** (7.495)	3.301 (6.406)	-20.297** (8.239)	-7.932 (6.410)	-21.952*** (8.116)
Legal quality trend	.042 (.327)	-.589* (.343)	-.037 (.313)	-.7056** (.348)	-.183 (.299)	-.877** (.355)
Policy quality trend	.380 (.325)	.741*** (.257)	.589* (.320)	.832*** (.240)	.450 (.297)	.685** (.265)
Social tensions trend	-.511 (.423)	-.367 (.254)	-.618 (.401)	-.458* (.255)	-.314 (.389)	-.318 (.269)
Alternative index	.013 (.229)	-.847 (.655)	-.314 (.632)	-1.902 (3.348)	-.033 (.054)	-2.258** (.897)
CV alternative	-1.858 (2.295)	2.565 (1.822)	-1.371 (1.099)	-4.356* (2.353)	-.099 (.151)	9.803 (15.498)
Alternative trend	1.108 (1.108)	1.414 (1.931)	-.048 (.576)	-5.168** (2.543)	.050 (.060)	34.654** (15.815)
Observations	311	136	308	131	308	122
Countries	98	39	98	38	97	35
Between R square	.000	.378	.000	.252	.000	.064
Within R square	.403	.811	.397	.818	.434	.826
F statistic	6.90	17.57	6.60	17.55	7.74	16.95
Hausmann test	87.10***	58.42***	21.10	62.79***	5296.49***	45.65***

Notes. \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects.

**Table A7.** Growth effects of institutional quality, instability and trend – using the three PCA indices along with alternative institutional indicators and excluding outliers and tails

<i>Alternative:</i>	Poor	Rich	Poor	Rich	Poor	Rich
	Herfindahl index		No outliers		No tails	
	<i>Full baseline included</i>					
Legal quality	1.291** (.596)	1.243 (.853)	1.215** (.514)	1.964*** (.489)	.957* (.564)	1.684*** (.583)
Policy quality	1.949*** (.593)	.858* (.463)	1.499*** (.502)	.395 (.291)	1.392*** (.525)	.209 (.297)
Social tensions	.099 (.431)	1.661*** (.526)	-.313 (.375)	.281 (.314)	-.134 (.379)	.085 (.323)
CV legal quality	17.773** (8.307)	6.562 (11.652)	8.691 (7.126)	13.552* (7.267)	3.005 (7.129)	13.753 (8.481)
CV policy quality	-3.796 (7.052)	10.483 (8.772)	-11.243* (6.174)	8.262* (4.776)	-7.685 (6.369)	11.043** (5.006)
CV social tensions	-12.709 (8.163)	-.256 (12.284)	-8.086 (6.925)	-22.341*** (7.590)	.189 (7.001)	-20.933** (8.237)
Legal quality trend	.144 (.385)	-.039 (.545)	-.001 (.338)	-.167 (.307)	.074 (.329)	-.058 (.399)
Policy quality trend	.393 (.383)	.927** (.378)	.568* (.328)	.911*** (.221)	.336 (.333)	923*** (.243)
Social tensions trend	-.821 (.502)	-.385 (.391)	-.118 (.456)	-.547** (.246)	-.301 (.444)	-.735*** (.272)
Alternative index	-3.409** (1.392)	4.927** (2.352)				
CV alternative	-1.509 (1.602)	-.931 (2.536)				
Alternative trend	.035 (1.127)	1.213 (1.906)				
Observations	307	132	271	130	287	124
Countries	100	38	94	38	96	40
Between R square	.300	.018	.083	.367	.009	.397
Within R square	.253	.572	.512	.807	.469	.819
F statistic	3.56	5.63	10.57	19.80	9.67	19.49
Hausmann test	68.28***	202.72***	32.72***	205.25***	53.51***	121.25***

*Notes.* \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with country and period fixed effects.

**Table A8** Growth effects of institutional quality, including lagged growth

	All	Poor	Rich	All	Poor	Rich
Political risk	.078*** (.027)	.098*** (.036)	-.016 (.036)			
CV Political risk	-9.774** (4.494)	-10.864* (5.592)	-3.848 (6.758)			
Political risk trend	-1.800 (1.273)	-1.332 (1.515)	-6.210*** (2.018)			
Legal quality				1.081*** (.366)	1.267*** (.487)	1.460*** (.532)
Policy quality				.809*** (.303)	1.242*** (.472)	-.005 (.307)
Social tensions				.275 (.256)	.084 (.354)	.011 (.373)
CV legal quality				.209 (5.135)	4.864 (6.364)	13.947* (7.181)
CV policy quality				-3.913 (4.439)	-8.984 (5.855)	11.838** (4.972)
CV social tensions				.639 (5.013)	-1.372 (6.336)	-23.664*** (7.394)
Legal quality trend				.014 (.250)	-.029 (.312)	-.205 (.314)
Policy quality trend				.439* (.229)	.146 (.314)	.949*** (.242)
Social tensions trend				-.640** (.293)	-.311 (.404)	-.439* (.257)
Lagged growth	-.030 (.048)	-.077 (.066)	.125** (.059)	-.016 (.047)	-.075 (.065)	.042 (.055)
Observations	442	302	140	438	299	139
Countries	130	98	40	128	97	40
Between R square	.000	.004	.322	.004	.001	.306
Within R square	.369	.369	.692	.383	.378	.805
F statistic	15.97	10.30	18.14	10.68	6.62	19.96
Hausmann test	85.59	112.88	15.88	233.52	20.58	370.65

Notes. \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with fixed effects.

**Table A9.** Growth effects of institutional quality, IV estimates

	RE	Poor IV	IV	RE	Rich IV	IV
Legal quality	.956** (.388)	.778 (.494)	.927** (.446)	1.086*** (.299)	.816** (.361)	.975*** (.362)
Policy quality	1.785*** (.374)	.569 (.824)	1.009 (.643)	1.297*** (.272)	.892 (.727)	1.187** (.604)
Social tensions	.3742192 .283199	.398 (.393)	.524 (.333)	.669*** (.249)	.912*** (.306)	.742** (.302)
CV legal quality	5.505 (6.037)	2.732 (7.219)	1.438 (7.142)	-4.169 (8.065)	-10.692 (8.616)	-6.959 (8.373)
CV policy quality	-2.507 (5.604)	-14.717* (8.855)	-9.777 (7.551)	19.532*** (5.977)	16.190* (8.380)	16.480** (7.316)
CV social tensions	-2.112 (6.275)	8.632 (7.345)	7.695 (7.445)	5.508 (7.707)	16.959* (9.058)	11.132 (8.641)
Legal quality trend			1.253 (2.759)			7.869* (4.041)
Policy quality trend			2.596 (2.359)			1.442 (4.070)
Social tensions trend			-1.027 (3.322)			-6.277* (3.316)
Observations	282	282	282	138	138	138
Countries	96	96	96	40	40	40
Between R square	.359	.429	.448	.529	.615	.601
Within R square	.182	.089	.115	.614	.538	.588
Wald Chi Squared	93.84	90.78	103.19	152.75	116.66	145.93
First Stage Chi Squared		873	1235		1016	784
		934	1194		573	943
		748	1017		777	763

Notes. \*\*\* (\*\*) [\*] denote significance at  $p < .01$  ( $p < .05$ ) [ $p < .10$ ]; all regressions are GLS with random effects and period fixed effects. Control variables are used throughout but are not reported for reasons of space. Instruments are lagged institutional quality and lagged growth.