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Economic growth and judicial independence, a dozen years on: Cross-country evidence using an updated Set of indicators

Stefan Voigt [a], Jerg Gutmann [b], Lars P. Feld [c,*]

[a] Institute of Law & Economics, University of Hamburg and CESifo, Johnsallee 35, 20148 Hamburg, Germany
[b] Institute of Law & Economics, University of Hamburg, Johnsallee 35, 20148 Hamburg, Germany
[c] Walter Eucken Institut, University of Freiburg and CESifo, Goethestrasse 10, 79100 Freiburg i. Br., Germany

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ABSTRACT

Over 10 years ago, Feld and Voigt (2003) introduced an indicator for objectively measuring the actual independence of the judiciary and demonstrated its utility in a large cross-section of countries. The indicator has been widely used, but also criticized. Many new indicators for judicial independence have been developed since. Yet, all of them are based on subjective evaluations by experts or confined to measuring the legally prescribed level of independence. This paper presents more recent objective data on de jure and de facto judicial independence (JI) and strongly confirms previous results that de jure JI is not systematically related to economic growth, whereas de facto JI is highly significantly and robustly correlated with growth. In addition, we show that the effect of de facto JI depends on the institutional environment, but not on a country's initial per capita income.

1. Introduction

Thriving market economies depend on strong states that secure private property rights. Yet, a state's strength can be its greatest weakness: if it is strong enough to secure private property rights, it may also be strong enough to violate them. This insight is not new; it was already elegantly described by Hobbes: "For he that hath strength enough to protect all, wants not sufficiency to oppresse all" (Hobbes, 1651, Ch VI, n 3). Sometimes called the "dilemma of the strong state," the issue continues to be of interest, perhaps especially to scholars of political economy (see, e.g., Weingast, 1993). Indeed, the protection of private citizens from the discretionary infringement of their rights by the state might be even more important for long-run economic development than the public enforcement of private contracts (Acemoglu and Johnson, 2005). A simple promise to honor private property rights in the future will not be credible due to the state's time-inconsistent preferences and its ability to choose actions sequentially. The citizens know that after they have invested, the state has no incentive to keep its promise to protect private property rights. In such a setting, having an independent judiciary could make all actors better off: that is, if the judiciary is able to make the state keep its promises, the result will be additional and more productive (physical and human capital) investment, leading to faster economic growth, and eventually to higher tax

* Corresponding author at: Walter Eucken Institut, Goethestrasse 10, D-79100 Freiburg i. Br., Germany. Tel.: +49 761 790970; fax: +49 761 7909797.
E-mail address: feld@eucken.de (L.P. Feld).

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receipts for the state. The judiciary can reduce the time inconsistency of the government's preferences, in areas where it is unfeasible to delegate competences to independent bodies such as central banks.

In light of this seemingly win-win situation, one would expect that rational politicians had long since introduced judicial independence (JI). However, simply promising an independent judiciary is not sufficient to induce additional investment: if potential investors do not believe that the judiciary really is impartial, they will not change their investment behavior. It thus makes sense to distinguish between two kinds of JI: de jure and de facto. In short, de jure JI is what the law says (i.e., the law on the books); de facto JI refers to the independence actually enjoyed by judges. The latter will be the result of their effective term lengths, the degree to which judgments have an impact on government behavior, and so forth. Furthermore, a judiciary that has effectively enjoyed independence has a reputation-enhancing effect on the government, making it even more costly to interfere with the independence of judges in the future. This allows for the simultaneous establishment of different equilibria with high and low levels of independence. Ferejohn (1999) discusses under which conditions such equilibria can be stable, i.e. self-enforcing. Different levels of JI can not only be explained by path dependencies, but might also result from countries' reliance on alternative constitutional commitment mechanisms to JI, for example federalism (Weingast, 1993). Aside from trade-offs at the constitutional stage, the attractiveness of JI might depend on the level of political competition and polarization (Hanssen, 2004).

Feld and Voigt (2003) introduced both a de jure and a de facto indicator of JI a dozen years ago. As the first objective approach to evaluate de facto JI across countries, the indicators were met with great interest, but they also drew criticism (e.g., Rios-Figueroa and Staton, 2012). This paper introduces updates for both indicators and then employs them to answer three questions. (1) Does JI have a significant impact on economic growth? For this purpose, we replicate the results of Feld and Voigt (2003) for a more recent time period and a larger country sample. (2) Are improvements in JI associated with higher growth rates? Here we can employ changes in our indicators between the two waves. (3) Given that the effect of JI also depends on other constitutional traits, can these traits serve as substitutes for or complements to JI?

Based on a sample of as many as 104 countries and analyzing the growth rate of income per capita between 1990 and 2008, we find that (1) de jure JI is virtually uncorrelated with economic growth, whereas de facto JI is highly significantly correlated with growth. The previous results by Feld and Voigt (2003) are thus confirmed. (2) Improvements in de facto JI are indeed significantly correlated with faster growth. (3) The effect of de facto JI on growth is not significantly different for low- and high-income countries. However, the effect of de facto JI is reinforced by a high level of checks and balances and by having a semi-presidential form of government. Although states with a federal system, two chambers of parliament, or greater freedom of the press appear to benefit less from an independent judiciary, these differences are not statistically significant.

The remainder of the paper is organized as follows. Section 2 recaps the central theoretical conjectures on which our empirical analysis builds and then briefly surveys the recent literature on attempts to produce independence measures (not necessarily restricted to the judiciary). In Section 3, we present our two indicators and take a first look at some of their properties. Section 4 discusses possible complementarities of JI with basic constitutional traits such as bicameralism, federalism and the form of government. A number of bivariate correlations between the JI indicators and important aspects of the separation of powers are presented. Section 5 contains our regression model and the regression results. After discussing the empirical relationship between JI and economic growth, we inquire into the complementarity or substitutability between JI and the basic constitutional traits introduced above. Finally, we check the robustness of our empirical results. Section 6 concludes the paper and contains suggestions for future research.

2. Judicial independence: theory and measurement

JI implies that judges can expect their decisions to be implemented regardless of whether they are in the (short-term) interest of other government branches upon which implementation depends. It further implies that judges do not have to fear negative consequences as a result of their decisions, such as being fired, experiencing a cut in pay, or becoming less influential.[1]

There are three archetypical interaction situations in which JI is crucial.

(1) Conflict between citizens. If parties have entered voluntarily into a contract and one of them believes that the other is in violation of the contract, impartial dispute resolution is necessary. As long as both sides expect the judiciary to be impartial, they can save on transaction costs.
(2) Conflict between the government and citizens. The judiciary not only will have to ascertain the constitutionality of newly passed legislation, but will also have to check whether the representatives of the state have followed procedures designed to safeguard the rule of law. If the judiciary is not independent from the executive and the legislature, citizens will not trust in the rule of law.
(3) Conflict between government branches. In the absence of an impartial arbiter, conflicts between government branches are most likely to develop into power games.

Among the functions of government, reduction of uncertainty is of paramount importance. However, the law will reduce uncertainty only if the citizens can expect the letter of the law to be followed. An independent judiciary could be employed as a device for turning promises – for example, the protection of private property rights – into credible commitments (Voigt and Gutmann, 2013). If the judiciary performs this function, there will be more investment in physical and human capital and a higher degree of specialization. Hence, JI should be conducive to economic growth.

[1] Before JI can be defined, a theory of judicial behavior has to be adopted. We refer the reader to Epstein et al. (2013: 89 ff.) for a survey of studies on rational judicial behavior in US, foreign and international courts.

There have been various attempts to define JI. McCubbins and Rodriguez (2006) distinguish between approaches that concentrate more on institutions and those concentrating more on the behavior of relevant actors. Rios-Figueroa and Staton (2012) make a distinction between approaches centering on the autonomy of the judges or on their power. The construction of indicators of JI is, of course, heavily influenced by the definition adopted.

Most indicators of JI look at a number of institutions that insulate the judiciary from the other government branches. The various aspects of insulation are then coded and aggregated into a single indicator. The conceptual idea behind this approach is that the more insulated the judiciary is, the more independent it is from the other government branches. However, insulation will only affect behavior to the degree that it is effective; in other words, mere promises of insulation are not sufficient. To show that this has consequences, Feld and Voigt (2003) introduced the explicit distinction between measures of de jure and de facto JI, which is now an accepted standard in the literature.[2]

The judiciary is not the only device used to mitigate the government's commitment problem. For example, one strand of literature is concerned with the role and effects of independent agencies, such as those dealing with competition, network industries, the environment, the fight against corruption, and monetary policy.[3] A second strand studies the effects of the separation of powers as mandated on the constitutional level. Van Aaken et al. (2010), e.g., inquires into the independence of public prosecutors.

Independent agencies are sometimes referred to as "non-majoritarian institutions" (Majone, 2001) as their heads are appointed rather than elected by popular vote. This provides them less incentives to cater to short-term wishes of the electorate, thus making their commitments more credible. In that sense independent agencies have much in common with an independent judiciary. Klomp and de Haan (2010) subject the literature on central bank independence (CBI) and inflation to a meta-regression analysis and find that high levels of CBI are correlated with lower inflation regardless of the specific indicator used, the time period studied, and for both panel and cross-country regressions. Central bankers, who are not subject to re-election pressure, may simply be better suited to carry out promises of tight monetary supply. Keefer and Stasavage (2003) add to this literature by showing that a higher number of political veto players increases the effect of formal CBI on inflation levels. Hayo and Voigt (2008) find that higher levels of de facto JI are likely to trigger higher levels of de facto CBI and that de facto JI thus indirectly contributes to lower inflation. Many aspects relevant to measuring de jure and de facto CBI are also useful for measuring the independence of the judiciary – and are, in fact, used in this paper.

The constitutional economics literature concerned with the way separation of powers is organized at the constitutional level is closely related to the topic of this paper. Research into the economic effects of constitutions received a substantial boost from Persson and Tabellini (2003). Other studies in a similar vein inquire into the effects of federalism (Feld et al., 2005; Voigt and Blume, 2012; Baskaran and Feld, 2013; Asatryan and Feld, 2013) or of direct democracy (Feld and Savioz, 1997; Feld and Matsusaka, 2003; Blume et al., 2009). In the empirical section of this paper, we test whether the interaction between de facto JI and some of these variables can explain differences in growth. Such interactions will play a role if JI and other constitutional traits exhibit a pronounced complementary or substitutive relationship.

3. A description of our two indicators of judicial independence

3.1. Introductory remarks

The indicators presented in this section were first introduced in Feld and Voigt (2003). Although we agree that the universe of components that should be included in the indicator is open to debate, we leave the procedure for constructing the indicator completely unchanged to ensure comparability with the previous study. The only change is that the data are more recent and cover more countries. Some have criticized the way we aggregate the data (for lack of a convincing theory, we add the components up with equal weights). For example, Melton and Ginsburg (2014) argue that the impact of single components is likely to be conjunctive rather than additive. Again, we retain the original procedures for coding and indicator construction. However, the raw data are available upon request to researchers interested in constructing their own indicators.

The creation of our indicator was based on a few guiding principles. First, in many countries, the judiciary is made up of thousands of decision-makers and complexity needs to be radically reduced to produce a single number. Since all court systems are organized hierarchically, with higher courts able to overrule lower courts, the independence of the highest court is crucial for overall judicial independence. Also, it is costly for a government to exercise control over numerous small courts throughout a country. Putting pressure on the highest courts is more feasible and likely cost effective. Therefore, we focus only on a country's highest court, regardless of whether it deals exclusively with constitutional issues (e.g., the German Constitutional Court) or whether it is the Supreme Court for all areas of law (e.g., the U.S. Supreme Court).[4]

Second, we are interested in an objective indicator based on verifiable facts rather than on subjective perceptions so that, in principle, anybody interested in recalculating our indicator should arrive at identical values. This is an important advantage,

[2] Although it is, at times, interpreted rather oddly, as in Rios-Figuero and Staton (2012), who equate *de jure* JI with the incentives to behave and *de facto* with actual behavior. This distinction between *de jure* and *de facto*, however, makes only sense if *de jure* institutions are actually implemented. Our hunch that this is often not the case is why we introduced a *de facto*-measure in the first place.

[3] See, for example, Voigt (2009) on the independence of competition agencies or Hanretty and Koop (2012, 2013) on independent regulatory agencies.

[4] Our indicator could, hence, be criticized for being reflective of the independence of the highest court, but not the lower-tier courts of a country. To address this potential concern, we draw on data from the World Justice Project (Ponce and Botero, 2011). They ask the same experts whether, in practice, (1) the national and (2) the local courts in their country are free of political influence in their application of power. Both indicators are correlated with $r = 0.98$ for the 99 countries covered by their expert surveys. This observation lends credence to our indicator regarding its representativeness of a country's judiciary.

particularly of our de facto indicator, over other publicly available JI-indicators. The fact that subjective decisions play a minimal role in generating our data makes it particularly suitable to measuring the effect of JI on economic outcomes like growth. The reduced endogeneity problem relative to indicators where good economic performance may affect the evaluation of institutional quality comes at the price of lower country coverage and a lack of annual variation in our data.

3.2. A de jure indicator of judicial independence

Our first measure is based solely on the legal foundations of judicial independence as set out in official documents.[5] We draw on 23 characteristics grouped into 12 variables in order to assess formal JI. Each of the 12 variables can take on values between 0 and 1, where greater values indicate a higher level of JI. A country with a maximum degree of JI would score 12. Unfortunately, we were not able to obtain data on all 12 variables for some countries. We therefore use the mean of those variables for which data is available.[6] The 12 variables and the reasoning used for coding them are as follows:

(1/2) The independence of judges presupposes the stability of a set of institutional arrangements within which they operate. Formally, the stability of a court's powers and procedures depends on how difficult it is to change them. If they are specified in the constitution itself, we expect a greater degree of independence than in cases where these arrangements are fixed by ordinary law. However, this only holds if it is more difficult to change the constitution than to pass ordinary legislation. We therefore asked (1) whether the highest court is anchored in the constitution and (2) how difficult it is to amend the constitution.

(3) The procedure for appointing judges may have a notable effect on a court's independence. As one of the court's chief purposes is to protect citizens from illegitimate use of power by the authorities as well as to settle disputes between the branches of government, it ought to be as independent as possible. We hypothesize that the procedure for judicial appointment that implies most independence is appointment by professionals (other judges or jurists). The least independent method is appointment by one powerful politician (e.g., the prime minister or the minister of justice).[7]

(4/6) Judicial tenure will be crucial for the independence of the judiciary. We assume that judges are most independent if they are appointed for life or up to a mandatory retirement age and cannot be removed from office, save by legal procedure.

(5) Judges are less independent if their term is renewable because then they have an incentive to please those who can reappoint them.

(7) Further, if members of one of the other government branches have discretion in determining the judges' salaries, it could create an incentive to take the preferences of these members into account. In contrast, general rules that salaries cannot be reduced increase the independence of the judiciary.

(8) Additionally, judges should be paid adequately relative to other positions available to those with their qualifications, such as practicing lawyers or law professors.

(9) A precondition for JI to become effective is the accessibility of the court. For example, a court that is accessible only to a quorum of parliamentarians will be less effective in constraining government than one that is accessible to every citizen.

(10) If the allocation of cases to the members of the court is at the discretion of the chief justice, his or her influence will be substantially greater than that of the other judges. In such an institutional environment, it could be worth trying to influence just the chief justice. We expect JI to be larger if there is a general rule according to which cases are allocated.

(11) The authority given to the highest court does not bear directly on its independence. Yet, the court needs to have a certain level of authority in order to keep in check the other government branches. If the constitution is interpreted as the most basic formal layer of rules for restraining (and enabling) government, then constitutional review, that is, the authority to decide whether legislation is in conformity with the constitution, is crucial.[8]

(12) If courts are required to publish their decisions, their reasoning can become subject to public debate, which will make it more difficult for other government branches to exert influence on the courts' decision. Making dissenting opinions public will further increase transparency.

[5] The questionnaire on which the two indicators are based is available in Online Appendix 1.

[6] This means that equal weight is attached to all variables, as there is as yet no theory on which to base a quantification of their importance. One could also attach weights *ex post*, for example, by using factor analysis, such that the explanatory fit is maximized. Yet, in the absence of any appropriate theory, any weighting is more or less arbitrary.

[7] The number of different ways highest court judges are nominated and appointed is surprisingly high. For example, in Greece, some judges are chosen via a draw from a pool comprised of all Greek law professors meeting certain criteria. Hanssen (2004) lists five different procedures used by U.S. states. Padovano and Fiorina (2012) note that a "multi-tier appointment," that is, one in which a specified proportion of all judges is appointed by a specific group (e.g., the upper house), may not only create an allegiance to the appointing group but also foster solidarity with other judges appointed by the same tier, which could lead to the emergence of well-defined factions on the court.

[8] Logically, it is, of course, possible to separate judicial review from JI. We take judicial review into account in our measure of JI because it increases the formal power of the judiciary vis-à-vis the legislature.

3.3. A de facto indicator of judicial independence

We now turn to the issue of measuring actually implemented JI. As with the de jure indicator, no single proxy adequately reflects all relevant aspects of de facto JI; indeed, as many as eight variables are used. Again, each of the eight variables can take on values between 0 and 1 where greater values indicate a higher degree of JI.

The de jure indicator is based on legislation. Even if the constitution or ordinary law is changed frequently, exact values could be calculated at every single point in time. This does not hold for de facto JI. For example, the actual term length of highest court judges cannot be calculated immediately after a new constitution has been passed, but only after a longer period during which the legal rules have been in place. There is a trade-off in choosing the length of the interval for which JI is measured. A longer interval does not allow for tracing changes in JI over time, a shorter interval increases measurement error. The latter is easily illustrated by the example of a country where the president removes a high court judge every five years. Annual objective data on JI would be misleading, as it would indicate a rather independent judiciary in four out of five years. Another argument for measuring institutions that constrain executive action over a longer time period comes from Glaeser et al. (2004). Their criticism that short-run policies might be highly correlated with but not causally responsible for economic outcomes like growth is well taken. We therefore base the de facto indicator on events observed during the period between 1970 and 2010. This implies that the indicator is very sticky. We chose an interval that covers many years before the period in which we study economic growth to account for the fact that the past matters for how JI is evaluated by citizens and other potential investors. That is, a government – or, more broadly, a regime – cannot attain a reputation as law abiding or JI respecting overnight. Below is a list of our eight variables and the reasoning used for their coding:

(1–3) A crucial aspect of de facto JI will be the effective average term length of the members of the highest court. For coding, we simply multiply the effective average term length in years by 0.05.[9] Thus, a country receives the highest possible score of 1 if the average term length is 20 years or more. If the actual term length and the one defined by the law on the books deviate, the country is coded 0 in a second variable. Removing a judge before the end of his or her term can be a serious breach of JI. If this has occurred at least once, the country is coded 0 in a third variable.

(4) By changing the number of judges, a government can manipulate the court majority in its favor. This is what U.S. President Roosevelt intended with his plan to "pack" the Supreme Court. Changing the number of judges is, hence, interpreted as detrimental to JI.

(5/6) The importance of an adequate income was discussed above. With regard to the de facto situation, we are interested in whether the inflation-adjusted income of judges has at least remained constant. However, the quality of court output not only depends on the income level of judges, but also on the number of clerks, the size of the library, the availability of modern computer equipment, and the like. We take this aspect into account by asking for the development of the court's budget in real terms.

(7) Any change in the legal framework of the highest court may raise concerns about the durability of these rules and is hence interpreted as indicating low de facto JI.

(8) JI is at risk if the implementation of court decisions depends on action by some other branch of government. The more frequently court decisions have not been enforced, the lower the level of JI.[10]

Our de jure indicator is available for 124 countries. Collecting data on de facto JI is more difficult. To ensure a minimum amount of accuracy, countries are included only if at least three variables for de facto independence are available. As a result, only 118 countries are coded.[11]

The underlying data come from country experts who answered a questionnaire. They were not asked to make subjective evaluations of the situation in the country; instead they were asked to provide information on the legal structure of the judiciary and on actual events or developments. Such objective data should be clear from most systematic subjective biases, including responses to a country's economic performance. Of course, our respondents may not have been completely unbiased. For example, aside from the well-known social desirability bias, a loyal citizen could try to make his country look better than it really is or a political activist striving for improvement might try to make her country look worse than it really is. This problem can however be mitigated for the most part by comparing different questionnaires for the same country. Among the experts were supreme court judges, law professors, lawyers, and activists from organizations such as Transparency International. For most countries we received far more than one questionnaire, which enables us to double-check the answers and get back to the experts in case of ambiguity.

We have pointed out that our de facto indicator has the advantage of being very objective. A disadvantage of our approach is that we cannot capture specific forms of exercising control over the judiciary. Where a court is, e.g., dependent because it is staffed by family members of the president, the executive will not have to bribe or coerce judges in a measurable way. Equally, if judges are selected primarily based on their loyalty to a communist party they may not have to be threatened with removal from office to comply with party discipline. Such cases contribute to measurement error in our indicator – just like a country whose removal of a judge was well justified and not with the objective to dispose of him or intimidate others – but they should not lead to a systematic bias. Furthermore, the same argument could be made against any other objective independence indicator, such as the frequently used turnover rate of central bank governors.

[9] This variable is closely reminiscent of the turnover rate calculated for central bank governors and used as a proxy for their *de facto* independence. As noted in the literature on CBI, very long tenure can also indicate compliancy with government.

[10] This variable is somewhat subjective in that it presupposes an evaluation of whether or not the other branches cooperate with the court.

[11] Countries for which the *de facto* index could not be derived have a somewhat lower initial income and lower levels of education, but the difference is not statistically significant.

3.4. A first look at the two indicators

The new country scores (see Appendix 1), like the ones reported in Feld and Voigt (2003), contain some surprises. In light of the above discussion of the shortcomings of our measurement approach this is not unexpected. Results deviating from our expectations could be interpreted as red flags regarding the reliability of our indicators. And, indeed, in their discussion of various indicators purporting to measure JI, Rios-Figueroa and Staton (2012) state that our old de jure indicator is not very reliable, while the authors evaluate the reliability of the corresponding de facto indicator as high. Remember, however, that our central hypothesis states that only de facto JI will be crucial for economic growth. It is hence reassuring that others attribute a high reliability to our de facto indicator. Second, it is worth reiterating that de jure JI reflects mere promises by the government. It is not unexpected that some of the countries promising much are not necessarily among those in which de facto JI flourishes. In addition, it seems intuitive that younger countries that created the relevant constitutional rules fairly recently will have better de jure scores than older countries, if the various components of JI have become part of the orthodoxy only recently.

Moreover, the credibility of our indicators is supported by certain concrete findings. First, the bivariate correlations between the old and the new indicators are in both cases significant at the one-percent level ($r_{dj} = 0.47$, $r_{df} = 0.35$). This indicates some durability of JI. Second, Hayo and Voigt (2012) code about two dozen aspects of JI as safeguarded in countries' constitutions. Their data allow for measuring changes in JI between 1990 and 2005. Interestingly, changes in their indicators are not only significantly correlated with changes in our de jure indicator, but also in our de facto indicator ($r = 0.28$ and $r = 0.37$ respectively). This is reassuring in light of Glaeser et al.'s (2004) critique that frequently employed indicators for institutions have little to do with constitutional constraints. Furthermore, this observation supports Hayo and Voigt's (2007) result that in spite of their low correlation, de jure JI may still be an effective instrument to increase de facto JI (see Melton and Ginsburg, 2014 for a more nuanced analysis). Third, the differences between our de jure and de facto measures are highly correlated between the two waves ($r = 0.34$). In other words, countries that delivered more (or less) de facto JI in the past than could have been expected from their legal provisions are likely to continue. Fourth, Law and Versteeg (2013) offer measures for constitutional underperformers as well as for overperformers: underperformers are those who deliver less than they promise (in terms of human rights), whereas overperformers are those who deliver more than they promise. The difference between our de jure and de facto measures is significantly correlated with their over-/underperformance variables, which indicates that a gap between de jure and de facto JI is an expression of systematic deficits in implementing a country's constitution.

4. Judicial independence and basic constitutional traits

4.1. Potentially influential constitutional traits

Research in constitutional political economy shows that constitutions can have important effects on growth (for an overview, see Voigt, 2011). Given that these constitutional traits are likely exogenous and not a function of JI themselves, four different relationships with JI are conceivable: (1) they might be neutral, that is, the one does not affect the relationship of the other with the dependent variable; (2) they might be complementary, that is, higher levels of JI will reinforce the effect of the respective constitutional trait or vice versa; (3) they might be substitutive, that is, one of the institutions will suffice to elicit the effect; or (4) they might be contradictory, that is, the presence of one keeps the other from functioning properly.

JI is typically considered an element of the separation of powers as it defines the degree to which judges can make decisions without interference from other branches of the government. Separation of powers is one way of increasing a state's commitment capacity. Consequently, it seems advisable to analyze constitutional rules that also impact the separation of powers. In constitutional political economy, the form of government, federalism, and bicameralism are found to play a central role, which is why we analyze the effect on economic growth each of them has in combination with JI.

Many scholars (e.g., Persson et al., 1997) argue that presidential systems imply a higher degree of separation of powers than parliamentary systems, as their executive does not depend on the consent of the legislature for its survival. It has also been observed that presidents often claim to be the only politicians representing the entire nation and that they are more likely than prime ministers to simply ignore the legislature. In such a situation, an independent judiciary could help monitor the behavior of presidents. Given that less monitoring is needed in parliamentary systems, an independent judiciary should display stronger effects in presidential systems.

Federalism is also strongly linked to the separation of powers. Yet, federalism also increases the potential for conflict among different layers of government. We conjectured that an independent judiciary might be beneficial if it is able to settle conflicts within the other branches of government. We thus conjecture that JI should be particularly beneficial in the presence of a federal constitutional structure. An analogous argument could be made regarding the number of veto players in the legislative process (Tsebelis, 2002).

Bicameralism is one more aspect of the separation of powers. It is positively correlated with federalism as federally structured states need a chamber representing the states making up the federation. However, there are also many countries with a unitary constitutional structure that have two legislative chambers. Our conjecture is that in bicameral systems there is more need for an independent arbiter. We hence expect JI to have a stronger effect in bicameral systems.

4.2. Bivariate correlations between JI and constitutional traits

Bivariate correlations can provide insights into how JI is related to other important political institutions, which may, in turn, reveal whether these other institutions are generally used as complements to or substitutes for JI. For example, federalism is an alternative

approach to making politics more transparent and politicians more accountable to their constituents. We focus here on the degree of checks and balances, federalism, bicameralism and political regime types. The variable "checks" from the Database of Political Institutions (Keefer and Stasavage, 2003) measures the number of independent veto players in the political system. Data on federalism comes from Norris (2009). Bicameralism is a dummy based on information published by the Inter-Parliamentary Union (2013). Regime types were coded by Cheibub et al. (2010). Table 1 shows that countries with more checks and balances tend to have a higher de jure index. Autocracies promise less and parliamentary democracies promise more JI than other countries. Surprisingly, none of the studied constitutional traits are significantly related to the level of de facto JI.

5. Judicial independence and economic growth

5.1. Data description and estimation approach

To test our hypotheses regarding the relationship between JI and a country's economic growth, we rely on a standard cross-country growth regression. Our empirical approach is analogous to that employed in Feld and Voigt (2003) to ensure comparability of the results. The following equation is estimated:

$$\Delta Y_i = \alpha * M_i + \beta * JI_i + \gamma * Z_i + \varepsilon_i \quad (1)$$

where ΔY_i is the average real GDP per capita growth rate of country i between the years 1990 and 2008, M_i is a vector of standard explanatory variables, JI_i is a vector of de jure and de facto JI, Z_i is a vector of additional explanatory variables introduced to prevent omitted variable bias, and ε_i is the error term.

Consistent with standard growth theory, the vector M_i consists of three variables: "initial" real GDP per capita in 1990 ("initial income"), private and public investment in percent of GDP averaged over the period 1990 to 2008 ("investment"), and the percentage of secondary school attainment in the total population aged 15 and over in 1990 ("education"). The last variable is from the Barro and Lee (2013) dataset; the other two are part of the Penn World Table 8.0 (Feenstra et al., 2013). GDP data are expenditure based and PPP adjusted at constant prices.

The vector Z_i is made up of four indicators. Average government consumption in percent of GDP between 1990 and 2008 ("government size") and average population growth ("population growth") are both from Feenstra et al. (2013). We also control for average trade openness measured by the sum of exports and imports as a share in GDP ("trade openness"), which is derived from the PWT 7.1 dataset, and the average inflation rate ("inflation rate"), taken from the World Development Indicators. Feld and Voigt (2003) have included an additional dummy variable for transition countries (mostly in Central and Eastern Europe) in part because the period covered by that paper was 1980 to 1998 and thus included the transition years. Some of the countries covered did not even exist until after 1990 and thus the growth rates for the 1980s were necessarily crude estimates. To ensure comparability with the previous study, we also include a transition dummy ("transition country"), but do not expect it to be significantly different from zero. Table 2 provides descriptive statistics for all variables employed in our regression analysis and Appendix 2 lists detailed variable descriptions.

The empirical strategy is straightforward. First, a baseline regression is estimated, to which we add stepwise the two JI indicators and a set of additional control variables. All models are estimated using OLS. In a second step, we study the influence of differences in JI across time, that is, whether an improvement in JI is related to higher economic growth. In a third step, we ask whether other political

Table 1
Correlations between judicial independence and constitutional design features (N = 114).

	DJ-JI	DF-JI	Checks	Federal	Bicameral
De facto JI	−0.01	1.00			
	[0.94]				
Checks	0.31*	0.07	1.00		
	[0.00]	[0.45]			
Federalism	0.12	−0.02	0.33*	1.00	
	[0.20]	[0.83]	[0.00]		
Bicameralism	0.08	−0.02	0.15	0.43*	1.00
	[0.39]	[0.80]	[0.12]	[0.00]	
Autocracy	−0.37*	−0.05	−0.40*	−0.03	0.13
	[0.00]	[0.58]	[0.00]	[0.77]	[0.16]
Presidential democracy	0.04	−0.10	0.11	0.07	−0.00
	[0.67]	[0.31]	[0.24]	[0.47]	[1.00]
Semi-presidential democracy	0.10	0.08	0.02	−0.14	−0.20*
	[0.31]	[0.41]	[0.86]	[0.13]	[0.03]
Parliamentary democracy	0.27*	0.08	0.30*	0.09	0.04
	[0.00]	[0.38]	[0.00]	[0.35]	[0.67]

Note: Pearson correlation coefficients, p-values in brackets, *: $p < 0.05$.

Table 2
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Economic growth	104	2.267	1.763	−4.044	9.252
Initial income	104	9.081	8.493	0.336	32.569
Education	104	17.863	12.543	0.549	57.837
Investment	104	20.327	6.696	5.704	40.720
Transition country	104	0.173	0.380	0	1
De jure JI	104	0.633	0.142	0.300	0.934
De facto JI	104	0.631	0.234	0.133	1.000
Population growth	104	1.288	1.085	−1.008	3.665
Trade openness	104	74.399	46.067	20.870	336.528
Government size	104	18.908	8.201	5.683	50.611
Inflation rate	102	56.864	209.987	−0.349	1979.170
De jure JI (old)	81	0.629	0.161	0.159	0.939
De facto JI (old)	70	0.565	0.234	0.133	1.000
De jure JI difference	81	0.013	0.155	−0.483	0.373
De facto JI difference	70	0.078	0.267	−0.383	0.727
Checks	100	3.330	1.491	1	8
Federalism	103	0.155	0.364	0	1
Bicameralism	104	0.471	0.502	0	1
Press freedom	103	41.936	22.196	8.625	83.875
Democracy (Polity)	101	5.137	5.168	−7	10
Democracy (DD)	103	0.738	0.442	0	1
Autocracy	103	0.262	0.442	0	1
Presidential democracy	103	0.282	0.452	0	1
Semi-pres. democracy	103	0.184	0.390	0	1
Parliamentary democracy	103	0.272	0.447	0	1

Note: Based on regression sample for Table 3.

institutions such as parliamentary democracy or federalism operate as substitutes for or complements to JI. Finally, we inquire into the robustness of our results to changes in the construction of our indicator and the use of a robust regression-estimator.

5.2. Regression results

The estimation results are presented in Table 3. In the basic growth model without JI, all coefficients have the expected sign. However, neither education nor the transition dummy is statistically significant. The insignificant transition dummy indicates that

Table 3
Judicial independence and economic growth.

	(1)	(2)	(3)	(4)	(5)	(6)
Initial income	−0.069***	−0.069**	−0.074***	−0.074***	−0.078***	−0.095***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.024)	(0.023)
Education	0.008	0.008	0.006	0.006	0.009	0.011
	(0.015)	(0.015)	(0.014)	(0.014)	(0.017)	(0.015)
Investment	0.128***	0.128***	0.126***	0.127***	0.137***	0.131***
	(0.023)	(0.023)	(0.022)	(0.023)	(0.027)	(0.026)
Transition country	−0.218	−0.213	−0.181	−0.177	−0.239	−0.113
	(0.407)	(0.409)	(0.399)	(0.401)	(0.488)	(0.571)
De jure JI		−0.213		−0.154	0.076	−0.768
		(0.929)		(0.910)	(1.094)	(0.936)
De facto JI			1.286*	1.283*	1.119	1.341*
			(0.566)	(0.569)	(0.676)	(0.577)
Population growth						−0.132
						(0.207)
Trade openness						−0.004
						(0.004)
Government size						0.006
						(0.020)
Inflation rate						−0.004*
						(0.002)
Constant	0.172	0.291	−0.546	−0.459	−0.690	0.354
	(0.447)	(0.685)	(0.540)	(0.748)	(0.903)	(1.067)
Outlier dummies	YES	YES	YES	YES	NO	YES
Observations	104	104	104	104	104	102
Adjusted-R^2	0.459	0.453	0.481	0.476	0.221	0.486

Note: OLS coefficient estimates, standard errors in parentheses, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. Coefficient estimates on dummies for China, DR Congo, and Trinidad & Tobago omitted. Cook's D of the influential observations in the above order for (5): 0.156, 0.089 and 0.112.

these countries have become "normal" in the sense that they do not exhibit systematically different growth rates after controlling for a set of variables prescribed by standard growth theory. Residual plots and Cook's D identify a set of influential observations. Thus, the results reported in Table 3 are based on regressions that include country dummies for the Democratic Republic of Congo, China, and Trinidad & Tobago. China and the resource-rich Trinidad & Tobago grew on average five percentage points faster than predicted by our model, whereas the war-torn Democratic Republic of Congo underperformed by almost six percentage points. Further regression diagnostics indicate no problems with heteroscedasticity, model specification, or multicollinearity.

The inclusion of both de jure and de facto JI reveals that de jure JI has a negative coefficient but is not statistically significant. The picture changes substantially, however, with regard to de facto JI, the effect of which is statistically significant at the 5 percent level. The coefficient indicates that a country that switches from a completely dependent judiciary to a completely independent one would be expected to grow 1.3 percentage points faster than a country that remained at the original level of de facto JI in an average year. Compared to the results of Feld and Voigt (2003), the coefficient is smaller in size, but estimated with more precision. If these results are robust and causal, they imply that de facto JI plays a very important role in explaining differences in growth rates.[12] If we estimate the same model, but leave out the dummy variables for the DR Congo, China, and Trinidad & Tobago, the t-statistics (indicating marginal significance) are not reliable anymore because of a violation of the normality assumption. The regression results indicate, however, that the estimated coefficient of de facto JI is only slightly reduced to 1.12 thus still showing an economically significant effect. Overall, the estimated effects remain relatively robust. Moreover, we check the robustness of our results by including additional covariates: government consumption, trade openness, and the inflation rate, as well as population growth. Only the inflation rate is significant and has the expected negative sign. The coefficient estimate for de facto JI does not change after adding more control variables.

The fact that the estimates for de facto JI are almost identical to the previous results – even though we use a different time period and a larger country sample than in Feld and Voigt (2003) – is reassuring. And because the two studies use an identical questionnaire, we can go one step further and analyze whether improvements in JI at a given level of JI in the first wave are associated with higher growth rates. We find that countries that improved their de facto scores for a given initial level of JI grow faster, whereas improvements in the de jure indicator exhibit no statistically significant effect. These results are reported in Table 4.

We conclude that de jure JI is not sufficient to generate higher growth rates, whereas de facto JI can predict differences in average growth rates between countries. De facto JI is not only statistically but also economically significant.

5.3. Effect heterogeneity: interactions with covariates

In this paper we view JI as an instrument with which the government can credibly commit to its own promises. Alternative instruments for this purpose include the separation of powers and federalism (as a way to separate powers vertically). Generally, compared to autocracies, democracies might have fewer credibility problems, implying that autocracies will gain relatively more than democracies from high levels of JI – if JI is actually implemented.

Above, we briefly discussed two conflicting hypotheses regarding the effect of form of government in democracies. The conventional view is that presidential democracies are characterized by a stronger separation of powers, which should give these governments a higher commitment capacity. The alternative view is that the president's dominant role could lead to an abuse of power, resulting in instability and slower economic development. Finally, the presence of a free press might reinforce JI and its effects, as transparency makes it more costly for government to interfere in the realm of the judiciary.

Table 5 begins with the interaction between de facto JI and the actually realized degree of checks and balances. We find that the interaction term is significant and that there is a complementary relationship between the two, while the overall effect of de facto JI remains significant as the F-test on joint significance of 5.52 at the bottom of Table 5 indicates. Consequently, we would predict a positive effect of de facto JI in countries with a level of at least three in checks and balances. At a level of three, we estimate a marginal effect on the growth rate of 1.3 percentage points, which would further increase with higher levels of "checks."

When we interact de facto JI with a dummy for federally constituted states, a dummy for bicameralism, or the level of press freedom, we find substitutive relationships in each case.[13] Therefore, it could be argued that judicial independence is effective in promoting growth only in the absence of federalism, bicameralism, and freedom of the press. However, the difference is not statistically significant for any of them and the overall effects of de facto JI as indicated by the F-tests at the bottom of Table 5 remain significantly different from zero, the only exception being the press freedom equation.

When the continuous democracy indicator (polity2) by Marshall et al. (2013) is interacted with de facto JI, the interaction term is not statistically significant, and this does not change when a dichotomous democracy variable by Cheibub et al. (2010) is employed instead.[14] Yet, when we differentiate democracies according to their form of government, we find a growth-enhancing effect of de facto JI in semi-presidential democracies, which benefit significantly more from having an independent judiciary than does any other form of government. Autocracies benefit the least from JI, although this difference is not statistically significant. Another interesting result is that in the complete absence of JI, semi-presidential democracies grow less than any other form of government. Thus, these countries might not only benefit substantially from but may even depend on a de facto independent judiciary.

[12] This effect is very large but unlikely ever to be observed in practice, as no country will simply move from one end of the spectrum to the other. Improving *de facto* JI by one standard deviation implies a predicted increase in the average annual growth rate of 0.3 percentage points.

[13] Freedom of the press is measured by Freedom House (2013).

[14] Regression results available on request.

Table 4
Differences in judicial independence and economic growth.

	(1)	(2)	(3)
De jure JI (old)	−1.923	−2.129*	−1.767
	(1.107)	(0.859)	(1.035)
De facto JI (old)	0.243	1.610*	1.564*
	(0.649)	(0.732)	(0.739)
De jure JI difference	0.522		0.668
	(1.125)		(1.052)
De facto JI difference		1.793**	1.809**
		(0.576)	(0.580)
Initial income	−0.087***	−0.096***	−0.093***
	(0.021)	(0.019)	(0.019)
Education	0.024	0.024	0.025
	(0.014)	(0.013)	(0.013)
Investment	0.100***	0.112***	0.110***
	(0.024)	(0.022)	(0.023)
Transition country	−0.169	−0.145	−0.177
	(0.430)	(0.397)	(0.402)
Constant	1.800*	0.856	0.646
	(0.840)	(0.798)	(0.868)
Outlier dummies	YES	YES	YES
Observations	70	70	70
Adjusted-R^2	0.516	0.582	0.578

Note: OLS coefficient estimates, standard errors in parentheses, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. Coefficient estimates on dummies for China and Trinidad & Tobago omitted.

Finally, we interact de facto JI with the level of initial income to see whether its effect depends on the country's level of development; the interaction term is insignificant. Hence, it does not seem to matter whether a country is poor or rich: the effect of de facto JI will be the same.[15]

5.4. Robustness of the results

As noted above, countries are given a de facto score only if we have information on at least three of the eight components comprising de facto JI. This decision is of course arbitrary. Therefore, as a test of robustness, we change this threshold. Among the countries for which the de facto indicator is based on exactly three variables Armenia, Azerbaijan, and Iran have scores substantially above the level one might expect. Leaving out all nine countries where the index is based on three components, the coefficient estimate on de facto JI increases to 1.53 and stays significant (results available on request). The inclusion of countries with incomplete answers in the de facto section of the survey seems to produce more conservative results.

Another robustness check concerns our inclusion of dummy variables in regressions to deal with overly influential observations. To demonstrate that our results are not affected by the selection of these outliers, we run all our regressions again without country dummies and based on a robust regression estimator that was developed by Li (1985). These regression tables are reported in Online Appendix 2. The differences in the results we find are minor. The effect of de facto JI as reported in Table 3 increases from 1.3 to 1.4 and remains statistically significant. The coefficient on changes in de facto JI as reported in Table 4 decreases from 1.8 to 1.6, but it is still highly statistically significant. The results in Table 5 are unaffected, except that the interaction term with federalism is now statistically significant. This indicates that de facto JI is less important for economic growth under federalism, which would be in line with the argument of Weingast (1993) that federalism can serve as an alternative constitutional commitment mechanism to JI. In sum, we find that our results are robust to minor changes in the construction of our JI-indicator and to the use of a robust regression estimator.

6. Conclusions and open questions

Based on a questionnaire answered by local experts, we construct a de jure and a de facto indicator for JI. Since exactly the same questionnaire was used in a previous study (Feld and Voigt, 2003), we now have information on changes in both de jure and de facto JI for a large number of countries. The findings of the previous paper are confirmed: de jure JI does not have a significant influence on growth, whereas de facto JI does have a robust statistically significant effect. Based on the differences in de facto JI between the two waves, we find that improvements in de facto JI at given levels in the first wave are associated with higher growth rates.

With respect to the relationship between de facto JI and other attributes of the political system, we find that the realized level of checks and balances complements a high level of de facto JI. The growth performance of semi-presidential democratic countries appears to depend heavily on the presence of an actually independent judiciary. And finally, the growth-enhancing effect of de facto JI is independent of a country's income level, that is, poor countries benefit from high levels of de facto JI just as much as high-income countries.

[15] This result can be used to rebut the allegation by Rios-Figueroa and Staton (2012) that Feld and Voigt's (2003) analysis suffers from a sample selection problem in the sense that poor countries are underrepresented. The interaction effect indicates that this should not be a problem.

Table 5
Judicial independence, constitutional traits, and economic growth.

	(1)	(2)	(3)	(4)	(5)	(6)
De jure JI	−0.581	−0.052	−0.133	−0.476	−0.362	−0.154
	(0.940)	(0.917)	(0.912)	(0.988)	(1.001)	(0.916)
De facto JI	−1.501	1.653*	2.155*	2.062	0.219	1.279
	(1.249)	(0.629)	(0.830)	(1.396)	(0.892)	(0.776)
Checks	−0.528*					
	(0.262)					
df-JI*checks	0.949*					
	(0.388)					
Federalism		1.099				
		(1.001)				
df-JI*federalism		−2.311				
		(1.463)				
Bicameralism			0.866			
			(0.771)			
df-JI*bicameralism			−1.643			
			(1.141)			
Press freedom				0.005		
				(0.020)		
df-JI*press freedom				−0.019		
				(0.026)		
Presidential					−0.596	
					(0.933)	
Semi-presidential					−3.288**	
					(1.178)	
Parliamentary					−0.371	
					(1.160)	
df-JI*presidential					0.308	
					(1.379)	
df-JI*semi-presidential					5.099**	
					(1.709)	
df-JI*parliamentary					0.514	
					(1.659)	
df-JI*initial income						0.001
						(0.073)
Constant	1.562	−0.668	−0.871	−0.420	0.623	−0.457
	(1.006)	(0.770)	(0.819)	(1.445)	(0.860)	(0.810)
F statistic	5.52	3.58	3.60	2.24	3.51	2.52
p-value	0.006	0.032	0.031	0.112	0.011	0.086
Outlier dummies	YES	YES	YES	YES	YES	YES
Observations	100	103	104	103	103	104
Adjusted R^2	0.489	0.483	0.479	0.471	0.503	0.470

Note: OLS coefficient estimates, standard errors in parentheses, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. Coefficient estimates on initial income, investment, education, and transition country, as well as on dummies for China, DR Congo, and Trinidad & Tobago omitted. F statistic reported for joint test of de facto JI and all interaction terms in the model.

This paper adds to the evidence that de facto JI and economic growth are significantly and robustly correlated and employs updated objective indicators of JI to do so. Now there are follow-up questions to be answered. Given that JI induces faster growth, what are the exact transmission channels through which this effect manifests? Further: What is the exact relationship between judicial independence on the one hand and judicial accountability on the other? And how does the independence of the judiciary interact with the independence of other important actors who belong to the "justice system" of government, such as the police, the prosecutors, bailiffs, prison guards, and so on?

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Individuals: Jorge Alberto Fierro Abella (Colombia), Agresta (The Agresta Firm - New York, United States of America), Kofi Akainyah (A & A Law Consult, Ghana), Tarik H. Arida (Arida Law Firm, Jordan), Irena Bachanovikj (Macedonia), Roger Ballard-Tremeer (The Republic of Angola), Guy J. Bandana Guerrero (GUY JOSE BENDANA-GUERRO & ASOCIADOS, Nicaragua), Chen Bao (Belgium), Sabela Oubina Barbolla (Carlos III University, Spain), Santiago Basabe-Serrano (Department of Political Studies. Facultad

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.ejpoleco.2015.01.004.

Appendix 1. Indicators of Judicial Independence

Country	*De Jure* (Old)	*De Jure* (New)	*De Facto* (Old)	*De Facto* (New)
Albania		0.828		0.508
Angola		0.783		
Argentina	0.665	0.722	0.333	0.167
Armenia	0.629	0.584	1.000	1.000
Australia	0.817	0.575	0.819	0.870
Austria	0.733	0.655	0.900	0.743
Azerbaijan	0.451	0.638		0.867
Bahamas	0.646		0.450	
Bangladesh	0.587	0.586	0.429	0.294
Belarus		0.452		0.300
Belgium	0.825	0.629	0.806	
Belize		0.599		0.503
Benin	0.691	0.445	0.550	0.757
Bolivia	0.726	0.634	0.560	0.333
Bosnia and Herzegovina		0.844		0.480
Botswana	0.841	0.825	0.414	0.960
Brazil	0.907	0.712	0.494	0.825
Bulgaria	0.397	0.762	0.133	0.667
Cambodia	0.341	0.504	0.200	0.708
Cameroon		0.690		0.233
Canada	0.681	0.733		0.714
Chile	0.778	0.788	0.575	0.710
China	0.406	0.554	0.370	0.417
Colombia	0.939	0.779	0.529	0.486

(continued)

Country	*De Jure* (Old)	*De Jure* (New)	*De Facto* (Old)	*De Facto* (New)
Congo, Democratic Republic		0.599		0.267
Costa Rica	0.685	0.621	0.920	0.933
Cote d'Ivoire	0.507	0.678	0.433	0.600
Croatia	0.570	0.671	0.657	0.350
Cyprus	0.817	0.742	0.743	0.400
Czech Republic	0.761	0.739	0.167	0.717
Denmark	0.779	0.712	0.813	0.650
Dominican Republic	0.839	0.753		0.750
Ecuador	0.835	0.738	0.388	0.375
Egypt	0.708	0.715	0.240	0.967
El Salvador		0.634		0.381
Equatorial Guinea		0.364		0.550
Eritrea		0.628		
Estonia	0.641	0.842	0.700	0.731
Ethiopia		0.656		0.217
Fiji	0.729		0.436	
Finland	0.544	0.587	0.450	0.560
France	0.634	0.689	0.786	0.607
Georgia	0.893	0.754	0.850	0.850
Germany	0.729	0.781	0.800	0.943
Ghana	0.464	0.525	0.300	0.800
Greece	0.833	0.843	0.500	0.481
Guatemala	0.499	0.465	0.529	0.481
Guyana		0.696		
Haiti	0.538			
Honduras	0.555	0.575		0.638
Hong Kong		0.812		0.950
Hungary	0.628	0.688	0.821	0.594
Iceland	0.554	0.454	0.675	0.360
India	0.629	0.804	0.708	0.750
Indonesia	0.300	0.528		0.631
Iran		0.485		0.933
Ireland		0.677		0.950
Israel	0.663	0.679	0.860	0.650
Italy	0.793	0.858	0.858	0.944
Japan	0.622	0.614	0.900	0.517
Jordan	0.573	0.604	0.200	0.267
Kazakhstan	0.538	0.362		
Kenya	0.709	0.785	0.175	0.543
Korea, South	0.607	0.663	0.588	0.463
Kuwait	0.574		1.000	
Kyrgyzstan		0.599		0.669
Laos		0.307		0.850
Latvia		0.658		0.600
Lebanon		0.496		0.433
Lesotho		0.769		0.867
Liberia		0.633		1.000
Lithuania	0.447	0.619	0.433	0.875
Macedonia		0.714		0.536
Madagascar	0.468	0.651	0.800	0.669
Malawi		0.521		0.500
Malaysia	0.313	0.389	0.270	0.270
Mauritania	0.569		0.600	
Mauritius	0.797			
Mexico	0.804	0.778	0.707	0.719
Moldova		0.549		0.550
Mongolia		0.706		0.567
Montenegro	0.465	0.750	0.100	0.536
Morocco	0.275	0.326		0.320
Mozambique	0.441	0.338	0.520	0.860
Myanmar		0.583		0.971
Namibia	0.684	0.362		0.950
Nepal	0.799	0.691	0.520	0.629
Netherlands	0.631	0.600	0.467	1.000
New Zealand	0.587	0.625	0.783	0.800
Nicaragua	0.357	0.603	0.320	0.300
Niger	0.423		0.080	
Nigeria	0.553	0.754	0.243	0.567
Norway	0.468	0.516	0.901	0.800

(continued on next page)

(continued)

Country	*De Jure* (Old)	*De Jure* (New)	*De Facto* (Old)	*De Facto* (New)
Pakistan	0.765	0.748	0.525	0.183
Panama	0.572		0.388	
Paraguay	0.658	0.576	0.490	0.467
Peru	0.485	0.678	0.160	0.420
Philippines	0.909	0.934	0.731	0.486
Poland	0.693	0.538		0.880
Portugal	0.530	0.781	0.706	0.711
Romania	0.548	0.919		0.571
Russia	0.845	0.362	0.133	0.686
Rwanda		0.585		0.133
Senegal	0.567	0.548		0.333
Serbia		0.522		0.533
Sierra Leone		0.566		0.133
Singapore	0.851	0.548	0.421	0.936
Slovakia	0.569	0.691	0.319	0.621
Slovenia	0.869	0.869	0.431	0.431
South Africa	0.681	0.767	0.825	0.886
Spain	0.551	0.744	0.750	0.439
Sri Lanka	0.476	0.527	0.813	0.943
Sudan		0.300		0.829
Sweden	0.605	0.494	0.700	0.680
Switzerland	0.459	0.490	0.943	0.933
Taiwan	0.575	0.798	0.863	0.914
Tajikistan		0.407		0.588
Tanzania	0.265	0.638		0.950
Thailand		0.728		0.629
Trinidad and Tobago	0.596	0.820	0.388	0.270
Tunisia		0.602		0.350
Turkey	0.774	0.795	0.800	0.743
Uganda	0.632	0.702	0.250	0.850
Ukraine	0.703	0.439	0.543	0.371
United Arab Emirates		0.531		
United Kingdom	0.626	0.385	0.830	0.950
United States	0.685	0.534	0.592	0.543
Uruguay	0.577	0.498	0.450	0.757
Uzbekistan		0.527		0.350
Vanuatu	0.377		0.320	
Venezuela	0.650	0.649	0.400	0.700
Vietnam	0.159	0.438		0.333
Yemen	0.617	0.677	0.400	0.533
Zambia	0.703		0.100	
Zimbabwe	0.723		0.131	

Appendix 2. Variable Description

Variable	Description
Economic Growth	Average annual growth rate of GDP per capita over the period 1990 to 2008 based on "rgdpna" by Feenstra et al. (2013).
Initial Income	GDP per capita in the first year of observation (1990 or later) based on "rgdpe" by Feenstra et al. (2013).
Education	Share of the population over 15 with complete secondary education (1990 or later) by Barro and Lee (2013).
Investment	Share of investment in GDP based on "csh_i" by Feenstra et al. (2013).
Transition Country	Dummy variable coded according to http://www.imf.org/external/np/exr/ib/2000/110300.htm.
De Jure JI	Own coding; see Section 4 and Online Appendix 1 for details.
De Facto JI	Own coding; see Section 4 and Online Appendix 1 for details.
Population Growth	Average annual population growth rate over the period 1990 to 2008 by Feenstra et al. (2013).
Trade Openness	Average level of trade openness over the period 1990 to 2008 based on "openk" in the Penn World Table 7.1.
Government Size	Share of government consumption in GDP based on "csh_g" by Feenstra et al. (2013).
Inflation Rate	Average annual inflation rate over the period 1990 to 2008 in the World Development Indicators.
De Jure JI (Old)	Data from Feld and Voigt (2003).
De Facto JI (Old)	Data from Feld and Voigt (2003).
De Jure JI Difference	*De jure* JI - *De jure* JI (old).
De Facto JI Difference	*De facto* JI - *De facto* JI (old).
Checks	Level of checks and balances in 2000 based on "checks" by Keefer and Stasavage (2003).
Federalism	Dummy variable (hybrids treated as unitary) by Norris (2009), coded according to Watts (1998).

(continued)

Variable	Description
Bicameralism	Dummy variable by the Inter-Parliamentary Union (2013).
Press Freedom	Average level of press freedom over the period 1990 to 2008 by Freedom House (2013).
Democracy (Polity)	Level of democracy or autocracy on a scale from −10 to + 10 (polity2) by Marshall et al. (2013).
Democracy (DD)	Political regime in 2008 based on "democracy" by Cheibub et al. (2010).
Autocracy	Political regime in 2008 based on "democracy" by Cheibub et al. (2010).
Presidential Democracy	Political regime in 2008 based on "regime" by Cheibub et al. (2010).
Semi-Pres. Democracy	Political regime in 2008 based on "regime" by Cheibub et al. (2010).
Parliamentary Democracy	Political regime in 2008 based on "regime" by Cheibub et al. (2010).

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