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Explaining Constitutional Change:

The Case of Judicial Independence

Bernd Hayo*

and

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Abstract

This paper studies the factors driving changes in judicial independence (JI) as incorporated in constitutions. Two indicators of constitutionally safeguarded JI are constructed. Variations in these indicators are identified based on changes in the constitutions of as many as 100 countries that occurred between 1950 and 2005. Four groups of factors are conjectured to be relevant for explaining these changes. We find only weak evidence for the insurance theory of judicial independence but strong evidence that the characteristics of individual leaders—such as how they acquired or lost power—play an important role in explaining changes in constitutionally safeguarded JI. This paper contributes not only to the literature on JI but also to the theory of endogenous constitutions.

Key Terms: judicial independence, constitutional change, endogenous constitutions, relevance of leaders.

JEL classification: H11, K10, P48.

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The results presented in this paper are the outcome of a substantial effort in coding constitutions. The project, "Comparative Constitutions Project," was originally started by Zachary Elkins et al. Most of the coding of the variables presented here was done by a team of research assistants composed of Marc Berendsen, Dante Castillo, Nora El Bialy, Nora Heil, Jens Merte, and Max Thesing. The team was coordinated by Jerg Gutmann. The team's help is gratefully acknowledged. Previous versions of this paper were presented at workshops at the University of Catania, Haifa and Bologna and at the annual meeting of the European Association of Law & Economics in Stockholm (2012). Suggestions by participants are gratefully acknowledged.

Explaining Constitutional Change: The Case of Judicial Independence

1. Introduction

Independence of the judiciary is a key element of the separation of powers construct. This concept as to how government should be organized originated during the Age of Enlightenment and has been one of continuing and growing interest to political theory scholars ever since. For Montesquieu, the judiciary was "en quelque façon nulle"; more recent treatises have noted a "global expansion of judicial power" (Tate and Vallinder 1995). In this paper, we analyze the factors that have led to changes in constitutionally safeguarded judicial independence. Previous research suggests that de facto JI rather than de jure JI appears to be conducive to economic growth (Feld and Voigt 2003, 2006). Hayo and Voigt (2007) show that although de jure and de facto judicial independence are not very highly correlated, de jure JI is the single most important predictor for de facto JI. If de jure JI has important consequences for political as well as economic outcomes, then understanding the determinants of de jure JI is of crucial significance.

Our study also contributes to the nascent research program of endogenous constitutions. Rather than taking constitutions as given, this literature focuses on identifying the main determinants of constitutional change (Aghion et al. 2004, Hayo and Voigt 2010a, Ticchi and Vindigni 2010). In a related paper analyzing change in constitutional rules about the form of government, we find that leadership characteristics play an important role in this context (Hayo and Voigt 2012). This finding suggests that individual traits of politicians need to be taken into account in work on endogenous constitutions.

In this paper, we study the determinants of changes in de jure JI as set forth in constitutional documents using multivariate estimation methods and employing a new large-scale panel dataset covering up to 100 countries over the period 1950 to 2005. We provide only a brief overview of our novel dataset here as it is described thoroughly in Hayo and Voigt (2010b).[1]

We construct two indicators of constitutionally safeguarded JI—a narrow one and a broad one. The narrow one is a dummy variable simply recording whether or not JI is explicitly mentioned in a constitution. The broad one is a latent factor derived from statistical factor analysis based on as many as 29 variables. We find that aspects of a country's political structure as well as individual characteristics of the relevant political leaders are strong predictors of changes in constitutional rules relating to JI.

[1] Based on the same worldwide dataset, Gutmann et al. (2012) describe the existence and change of judicial review in the constitution, which we consider a special aspect of JI.

The rest of the paper is organized as follows. Section 2 contains a brief survey of the relevant literature. Section 3 presents our conjectures as to the drivers of changes in constitutionally safeguarded JI and also contains a description of the data used to test the conjectures. Our measures of JI are described in Section 4 and the empirical strategy in Section 5. The results are presented and discussed in Section 6. Section 7 concludes.

2. Survey of the Literature

Two strands of literature are relevant here: the first one is concerned with the determinants of JI and the second one with determinants of constitutional rules more broadly.

Landes and Posner's (1975) analysis is a seminal contribution to the determinants of JI. In their "interest group theory of judicial independence," the authors argue that JI is in the interest of rational legislators because it allows them to enter into long-term deals with interest groups. If legislators can credibly promise some legislation favorable to interest groups and promise, in addition, that this legislation will remain unchanged over a long period of time, interest groups will be willing to pay a higher price for having the legislation implemented. Thus, utility-maximizing legislators have an incentive to make the judiciary more independent. The function of an independent judiciary is thus to protect the original intent of the legislators against future majorities that might have different interests. Landes and Posner's (1975) contribution has been widely discussed and criticized. Some scholars attempt to test it empirically, with mixed results. Voigt (1997) summarizes theoretical and empirical contributions to the theory. One of the theory's many weaknesses deserves special mention here: if legislators are assumed to be rational everywhere, there should be no variation in the degree of JI across countries. However, the recent descriptive study by Hayo and Voigt (2010b), which is based on a large sample of countries, shows that there is substantial cross-country variation. Thus, there is some doubt as to the validity of Landes and Posner's (1975) theory.

Inspired by the Japanese experience with JI, Ramseyer (1994) hypothesizes that politicians' post-constitutional expectations regarding two dimensions are of key importance for explaining changes in JI broadly conceived, namely, their expectation about (1) whether elections will continue to be held and (2) whether they will stay in power. If government members answer both questions in the affirmative, there should be no change toward more JI. Stephenson (2003) develops a more formal model along these lines. Hanssen (2004) puts forward a model of strategic institutional choice in the spirit of Ramseyer (1994) and tests its implications in the context of U.S. states. He finds that institutions fostering JI are more likely to arise under conditions of tight political competition and substantial differences in the positions taken by political parties. This literature is interested in JI broadly conceived;

however, we focus on constitutionally safeguarded JI only, which makes application of the theory less straightforward. First, it is difficult to safeguard policy decisions of an incumbent government expecting to lose the next election through enhancing constitutional JI. Second, even if this was the case, constitutional change usually requires supermajorities, implying that a large part of the current opposition must be willing to accept the changes. Since it is likely that the expectations of the current government and the current opposition regarding the next election are similar, why would the current opposition agree to a reduction of its future discretionary power?

Ginsburg's (2002) contribution is sometimes called the "insurance theory of judicial independence." Whereas Ramseyer (1994) is interested in in-period choices, Ginsburg explains the incentive of constitution makers. He expects their preferences regarding JI to be determined by the degree of uncertainty they face at the constitutional stage: if there is a great deal of uncertainty regarding their later position, they have a greater incentive to include JI (more precisely, judicial review, which we consider a part of JI) in the constitution. The term "insurance theory of judicial independence" is appropriate because by safeguarding JI in the constitution, constitution makers who foresee the possibility of being on the "other side of the fence" in the future use it as insurance to protect themselves against post-constitutional majorities that have interests detrimental to their own.

The second strand of literature relevant to this paper's topic is that which is interested in endogenizing constitutions more generally. Aghion et al. (2004) ask how much "unchecked power" a society should delegate to its leaders, study under what conditions societies can be expected to choose that optimal degree of delegation, and, finally, engage in some cross-country analysis. They equate "insulation" with unchecked power. For example, autocrats are more insulated than democratically elected governments. Within democracy, presidential systems are more insulated than parliamentary ones. What is the central driving force behind this variation in insulation? Aghion et al. (2004) find that insulation is positively and significantly correlated with both ethnic and linguistic fractionalization, meaning that highly fragmented societies are less democratic. However, if these fragmented societies are democratic, they can be expected to be presidential rather than parliamentary.

Ticchi and Vindigni (2010) seek to identify the factors determining the choice between "majoritarian" and "consensual" constitutions (the dichotomy was introduced by Lijphart 1999). "Majoritarian" constitutions are characterized not only by plurality rule, but by a number of other characteristics, including that the government is dominated by the executive and that governments are usually one-party governments. "Consensual" constitutions are characterized not only by having proportional representation, but also by more of a balance between the legislative and executive powers and this form of government is usually a

coalition, that is, a several-party government. Ticchi and Vindigni hypothesize that the factor driving the choice between majoritarian and consensual systems is the ex ante degree of income inequality: if it is relatively high, a majoritarian constitution is more likely; if it is relatively low, a consensual constitution is more likely.

Finally, Hayo and Voigt (2010a, 2012) analyze the main determinants of changes in government, that is, switches from parliamentary to presidential systems and vice versa. The more recent paper deserves explicit mention because, in addition to standard political, socio-demographic, and economic factors, it introduces (i) indicators of the process by which constitutions are generated, (ii) the influence of war and its outcome, and (iii) characteristics of relevant individual leaders as explanatory variables. The latter two factors are included in the vector of potential determinants considered here.[2]

3. Conjectures and Data

In this paper, we are interested in explaining changes in the degree to which JI is constitutionally safeguarded. Previous papers inquiring into the reasons for the first-time choice of both JI and judicial review include time-invariant explanatory factors such as geographic location and colonial history. Given that we investigate changes and, therefore, estimate our models in differences, time-invariant variables simply drop out. Put differently, our prime focus is on time-variant variables as potential determinants of constitutional change. From an economic point of view, the underlying assumption is that time-invariant factors cannot explain changes in the constitution at specific points in time.

In its most general sense, constitutional change can be thought of as the consequence of disequilibrium, which, in turn, is the result of a change in some basic conditions. These changes in the basic conditions can be mediated via changes in (1) the political system, (2) political conflicts, (3) leading politicians, that is, decision makers, and (4) the socioeconomic situation. In the remainder of the theory section of this paper, we discuss various factors that could cause change in constitutionally safeguarded JI and that also belong to one of these four categories. Rather than testing a formalized model, our analysis is primarily explorative in nature.

The first block of variables refers to specific characteristics of the political system. Regarding the potential relevance of changes in the political structure to changes in JI, our arguments mostly revolve around the degree of democracy. Democratization can be interpreted as a promise of the current elite(s) to include more (all) groups into collective decision making. On

[2] Note that the first group, indicators of the process by which constitutions are generated, is basically time invariant and, therefore, cannot be studied in the present framework.

the one hand, this promise needs to be credible and making government decisions subject to judicial control could be one way of accomplishing this. On the other hand, if a democracy is characterized by fractionalization across political parties, it will be much more difficult to change the constitution. In our analysis, we look at the following factors: changes in the degree of democracy, changes in democratic competitiveness, and uncertainty about the degree of democratization.

Given that democracy is a prime example of an "essentially contested concept" (Gallie 1956), we consider two indicators: Marshall and Jaggers's (2002) widely used Polity 2 measure and Vanhanen's (2000) concept of democratic competition and participation. Vanhanen operationalizes competition by the percentage of votes not cast for the largest party, whereas he measures participation by the percentage of the population that actually voted in the last election. His indicator is the product of these two variables.

Marshall and Jaggers (2002) also present a variable that indicates the degree to which there are informal rules regulating participation in the political process. This type of rule is found in both Western-type democracies and in one-party states; it merely takes different forms, namely: (1) "unregulated," (2) "multiple identities" (there are a few stable and enduring groups but few common interests), (3) "sectarian" (indicating intense factionalism and government favoritism), (4) "restricted" (significant groups, issues, and/or types of conventional participation are regularly excluded from the political process), and (5) "regulated" (stable and enduring groups compete for political influence with little use of coercion). Participation rules are an important aspect of political systems and provide a general picture of how the interests of specific groups are transmitted to political decision makers.

In addition, uncertainty about the degree of democracy in a country can have a negative impact on the government's ability to make credible commitments. Using the Polity 2 measure, we generate an indicator for degree of democratic uncertainty based on the conditional variance estimated in the framework of a GARCH(1,1) model (see Bollerslev 1986).

A second issue can be summarized as "political conflicts." Political conflict can have different effects on constitutional change. For example, internal violence can disrupt the policy-making process in a country and thereby delay constitutional amendment. However, if the internal conflict leads to a new political constellation, the outcome could very well be an increase in constitutional law making to reflect the new political power distribution. To account for various forms and intensities of internal political conflict, we include data on domestic conflicts, such as the number of anti-government demonstrations and the number of

assassinations, as well as government retaliatory measures, such as purges of the opposition. The conflict data are taken from the dataset developed by Banks (2004).

The third group of factors conjectured to determine changes in constitutionally safeguarded JI involves individual traits of leading politicians. Economists have long neglected the potential relevance of individuals; their emphasis on the relevance of institutions is accompanied by a relative lack of attention to the importance of individuals.[3] Ex ante, the characteristics of leaders are expected to be of particular relevance in times of political disequilibrium, that is, when the likelihood for constitutional change is high.

We believe that both the way leaders achieve power as well as the way they lose it can have an effect on constitutionally safeguarded JI. Prima facie, it seems straightforward to assume that leaders who acquire power through irregular means are more likely to reduce JI, but remember that we are dealing with de jure JI. Thus, rational leaders might think that increasing formal JI is a relatively cheap signal and they might, hence, be more likely to increase than reduce it. Further, the number of years a leader spends in office might have an effect. Our conjecture here is that longer terms in office make leaders more self-assured and lead them to reduce JI. Finally, the leader's gender may make a difference. Over the last decade, a number of papers have presented evidence that the gender of decision makers can influence political outcomes. For instance, Dollar et al. (2001) find that a larger share of female parliamentarians is significantly correlated with lower levels of corruption. Generalizing this finding, it could be that female leaders are more likely to implement higher degrees of JI than are their male counterparts.[4]

The Archigos dataset published by Goemans et al. (2009) contains specific information on individual leaders. We include the following leader-related variables in our analysis: age at taking office, a dummy variable indicating gender, a variable indicating years in office, a dummy variable capturing a change in leadership, and dummy variables indicating whether

[3] However, economists have started to investigate the role of leaders in different contexts. For example, Jones and Olken (2005) show that the unexpected death of a leader can have substantial repercussions on the country's growth. Besley et al. (2005) show that education reduces the likelihood that politicians will use power opportunistically, whereas Besley et al. (2011) show that education influences both economic growth and the probability of military conflicts. Göhlmann and Vaubel (2007) analyze the impact of the professional background of central bankers on inflation. Dreher et al. (2009) provide evidence suggesting that politicians' professional background has an impact on the likelihood of implementing market-liberalizing reforms. Hayo and Neumeier (2012) study the composition of public expenditure in the German Laender (states) using the socioeconomic status of prime ministers as their main variable of interest. They find strong and theory-consistent evidence that prime ministers tend to favor fiscal policies supporting the social class in which they were socialized. In contrast to economics, in law-related literature, judges' individual traits have been the subject of intensive analysis for a number of years. Segal and Spaeth (2002) is one of the most important contributions to this line of research.

[4] Related research includes Washington (2006), who finds that members of Congress who have daughters generate more women-friendly policies.

the leader took office through regular means, irregular means, or was installed by another state. We also have information on how leaders exit office. Dummy variables capture whether they lost office through regular means, whether they died of natural causes while in power, had to retire early due to ill health, or committed suicide. Dummy variables also describe irregular losses in power, deposition by an external power, or leaders still in office during our sample period. Finally, we include information about what happened to leaders one year after exiting office. Dummy variables capture whether they were exiled, imprisoned, or killed.

With our fourth group of variables, we attempt to capture the socioeconomic situation of countries. If the economy is perceived as developing poorly and the lack of JI is seen as responsible for this, an increase in formal JI is a possible response. But why would anybody attribute poor economic development to a lack of JI in the first place? Any government, when making any kind of policy announcement, faces a credibility problem. If it promises secure property rights for private investors, why should it keep its promise once the investment has been made? This problem is sometimes called "the dilemma of the strong state" and an independent judiciary could be one way of reducing this dilemma by giving judges the authority to decide whether the government has kept its promises. Thus, a lack of private investment causing poor economic development can indeed be attributed to a lack of JI.

Similar arguments can be made with regard to other policy areas. Consider, for example, the interest rate a government needs to pay when issuing sovereign bonds. The less credible a government's promises, the higher the rate it will have to pay. Again, an independent judiciary might alleviate the credibility problem. To proxy for (poor) economic development, we rely on frequently used indicators such as economic growth, the government share in GDP, openness, and the inflation rate. Additionally, we also take into account population growth, as a particularly fast- or slow-growing population could create difficulties for economic development.

The potential role of time and the age of a constitution are our final potential determinants of changes in JI. The central conjecture underlying this category is that constitutional rules are subject to fads and fashions. Moreover, the constitutions of many former colonies were strongly influenced by their former colonial powers. Over time, these societies have chosen to adjust at least some aspects of these "colonial" constitutions. Therefore, it is important to take into account when a country became independent and/or adopted its first constitution and the period during which fundamental constitutional change occurred. Given that it is difficult to model these effects, we simply include deterministic control variables and do not attempt to interpret them.

4. Measuring Constitutionally Safeguarded Judicial Independence

We construct two indicators of constitutionally safeguarded JI—a narrow one and a broad one. The narrow one is straightforward: we simply look at constitutions to see if they contain an explicit declaration as to the independence of the central judicial organ(s) and construct a dummy variable, called JIDummy, which is coded 1 if constitutionally guaranteed JI exists and 0 otherwise. We code this variable for as many as 100 countries on an annual basis between 1950 and 2006.

The advantage of JIDummy is that it is a straightforward measure of de jure JI and simple to construct. Yet, a sentence formally declaring the judiciary to be independent might be little more than a declaration of intent; that is, it is not clear whether a simple declaration of JI guarantees JI in practice. Although we do not test explicitly for de facto JI in this paper (on this issue, see Hayo and Voigt 2007), we believe that providing broader de jure support for JI in the constitution may enhance de facto JI. Some constitutions explain JI at great length and detail the appointment procedure, tenure, salary rules, court accessibility, and how cases are to be allocated to individual judges, as well as the judiciary's authority in regard to judicial review. We argue that the inclusion of at least some of these aspects increases the likelihood of observing greater de facto JI.[5]

The appointment procedure for judges may have a notable effect on the court's independence. As JI, inter alia, is intended to protect citizens from the illegitimate use of power by other government branches, as well as to settle disputes between branches of government, the judiciary ought to be as independent as possible from the influence of these other branches. We hypothesize that the most independent method of judicial appointments is when it is done by professionals (other judges or jurists). Presumably, the least independent method is appointment by one powerful politician (e.g., the prime minister or minister of justice).

In constructing the broad indicator for JI we also take into account aspects related to the appointment procedure. We argue that a procedure under which members of the judicial system have a great deal of influence on the nomination and approval of the chief justice and justices is likely helpful for JI. Thus, in our analysis we include constitutional indicators measuring whether the judiciary nominates the chief justice of the highest ordinary court and approves nominations for the chief justice. In addition, court members ought to have sufficient expertise, so ensuring that (i) the chief justice must be a lawyer and that (ii) all justices of highest ordinary court must be lawyers seem sensible precautions against

[5] Our coding effort began with the preliminary data provided by Zachary Elkins et al. in their "Comparative Constitutions Project" (2009), available at www.comparativeconstitutionsproject.org. We checked, and sometimes corrected, all their codings and filled in many missing observations.

undermining factual JI. In a similar vein, one might want to ensure that (iii) chief justices must have a certain amount or type of education and that they are (iv) nonfelons.

Judicial tenure is crucial to the independence of the judiciary. We assume that judges are especially independent if they are appointed for life (or up to a mandatory retirement age) and cannot be removed from office except by legal procedure. Judges are less independent if their terms are renewable because they have an incentive to please those who reappoint them.

In construction of the broad indicator, the following aspects were taken into account. What is the maximum term for judges for on highest ordinary court? Is it from 1 to 10 years or infinite? What restrictions are there on the number of terms members of the highest ordinary court may serve? Are there provisions for dismissing judges? Under what conditions can judges be dismissed? For example, what happens if they have committed a crime or engaged in dubious conduct or have become incapacitated? Who can propose the dismissal of judges? Is this the exclusive decision of the first (or only) chamber of the legislature or can other bodies make such a proposal?

Further, giving members of other branches of government the power to set judges' salaries gives judges an incentive to take these members' preferences explicitly into account. General rules ensuring judges' salaries tend to increase de facto JI. There are at least three ways this can be done, namely, safeguarding nominal salaries, real salaries, or relative salaries. The first possibility offers little protection in an inflationary environment or over longer periods of time. The second possibility ensures a constant absolute living standard, but could be detrimental to judges' social position in a high-growth economy. The third method of protecting the relative income position of judges over time protects their social position but does not ensure a specific living standard. The aspect coded for the broad JI indicator is: Does the constitution explicitly state that judicial salaries are protected from governmental intervention?

The authority delegated to the constitutional court does not directly affect its independence. Yet, the highest courts must have a minimum amount of authority in order to act as a check on other government branches. If the constitution is interpreted as the most basic formal layer of rules restraining (and enabling) government, then it is crucial that the court have the power to decide whether legislation conforms to the constitution. This is sometimes called the power of constitutional or judicial review.

In our analysis, we take into account various aspects of judicial review. Does the constitution assign responsibility for interpreting the constitution exclusively to the supreme court? Doing so would enhance the court's independence. Judicial review is a necessary condition for

Ginsburg's (2002) "insurance theory": members of the constitutional assembly can only insure themselves against shifting majorities by delegating the competence of judicial review to the court(s). Who can initiate challenges to the constitutionality of legislation? Allowing very broad access to judicial review, for instance, by the public through complaints, likely reduces JI, whereas a procedure under which these complaints are channeled through lawyers and courts likely helps maintain JI. Moreover, the consequences of judicial review, at least to some extent, determine the power of a constitutional court. In our investigation, we include indicators measuring the effect of a determination of unconstitutionality: (i) the law is void, (ii) it is void as to a specific case, but continues on the books, and (iii) the law is returned to legislature for revision/reconsideration.

If courts are required to publish their decisions, such decisions can become subject to public debate, which increases judges' incentive to present coherent and legally convincing arguments, thereby making it more difficult for representatives of other government branches to influence judicial decisions. Transparency will be even higher if the courts also publish well-founded dissenting opinions. The broad JI indicator captures whether the constitution provides for publication of judicial opinions by the highest ordinary court. Furthermore, we measure whether one of the following aspects is applicable to opinions from the highest ordinary court: (i) reasons are required in court decisions, (ii) dissenting opinions are allowed, and (iii) dissenting opinions are explicitly prohibited.

Again, these constitutional rules were coded for as many as 100 countries on an annual basis across the period from 1950 to 2005. Ex ante, many things are unclear from a theoretical point of view: the precise coding of individual variables, potential complementarities between them, the necessity of attaching different weights to the single variables, and so on. Given that we perceive there to be a low likelihood of resolving these issues on the basis of theoretical arguments, we follow a data-driven empirical approach. Specifically, we apply statistical factor analysis and identify the latent variable underlying our various indicators. In principle, the quality of the factor depends on the choice of individual variables. To ensure the robustness of our analysis, we construct three broad factors for JI differentiated by the number of variables included (see Appendix 1 for more information on the variables underlying the factor analyses).

Our broadest factor, JIFactor, is based on 29 constitutional indicators. Key statistics for this factor are set out in Table 1. We obtain an eigenvalue greater than 4 for the first estimated factor and explain 30% of the total variance. Since not all of these indicators affect JI in a straightforward way, we compute an alternative factor, JIFactorA, employing a subset of 22 indicators. We exclude variables for which we do not have quite as strong theoretical priors or that have very small estimated factor loadings. Again, we find a large eigenvalue and the

explanatory power of the first factor rises to 39%. Our last factor, JIFactorB, is based on only 15 indicators. It is computed by selecting from JIFactor only those variables with factor loadings larger than 0.3. The first factor is based on a similarly large eigenvalue and now explains more than 50% of the variance.

Table 1: Outcome of Factor Analysis

	Number of Variables Included	Eigenvalue	Variance Explained	Factor Loading on JI
JIFactor	29	4.5	30%	0.20
JIFactorA	22	4.0	39%	0.22
JIFactorB	15	4.1	54%	n.a.

Note that the factor loading (the equivalent to a correlation) on JI is relatively low and below the variable selection threshold applied to the computation of JIFactorB.

Calculating correlation coefficients between the three estimated factors measuring JI and our simple indicator JIDummy leads to the results shown in Table 2.

Table 2: Correlation Coefficients of Alternative Indicators for JI

	JIFactor	JIFactorA	JIFactorB
JIFactor	1		
JIFactorA	0.97	1	
JIFactorB	0.96	0.90	1
JIDummy	0.20	0.23	0.15

Thus, the three indicators derived from the factor analyses are highly correlated. Although JIFactorB contains only about half as many variables as JIFactor, the correlation coefficient is still very close to unity. We can safely conclude that our derivation of a broad indicator is highly robust and does not depend on the influence of doubtful individual variables. We also discover that the narrow JI indicator is not highly correlated with the broad JI indicators derived from the factor analyses, which reflects the relatively low factor loadings on this variable reported above.

Based on the results of this preliminary analysis, we continue our analysis based on two alternative dependent variables measuring JI: JIDummy, our most narrow indicator, and JIFactor, our broadest indicator.

5. Empirical Strategy

Constitutional rules change very little over time and hence their empirical indicators have a high degree of persistence. Identification of causal relationships is more or less impossible or has to be based on strict theoretical priors. Empirically, probably the only thing that can be discovered is some sort of multivariate correlation between de jure JI and the various explanatory variables.

Therefore, we adopt a two-facet approach that facilitates interpreting our results as causal. First, we employ a specification in first differences, which means we explain changes in de jure JI by changes in the explanatory variables, at least where doing so makes economic sense. We thus circumvent the issue of persistence in the dependent variable as well as in many explanatory variables. Note that this approach also avoids potential problems with the conventional difference-in-difference approach, namely, underestimated standard errors (Bertrand et al. 2004), as the transformation removes the first-order autocorrelation typically found for institutional variables. By differencing the variables, we also remove all issues related to possible stochastic nonstationarity of some variables, for example, GDP per capita, which is typically ignored in the institutional economics literature. Any remaining deterministic trends are potentially captured by a time trend and decade dummies. This differencing approach has the drawback that all time-invariant explanatory variables are dropped from the model. However, we do not have to worry about including a large number of country dummies to allow for the possibility that the error term is correlated with the explanatory variables.

Second, to take into account time lags of constitutional reform and dispense with any remaining endogeneity issues, we lag most of the explanatory variables by one period, at least where doing so can be justified on a priori grounds. Thus, we study whether a change in a variable last year causes a change in the degree of de jure JI this year and interpret the outcome of this analysis in a causal way.

None of the above-discussed theories provide any guidance in terms of the timing of institutional change. Put differently, the issue of how long it takes for the constitution to change after a change in an explanatory variable is rarely if ever addressed in the extant literature. On the surface, it seems straightforward to include richer dynamics as long as the panel framework is sufficiently large. However, many of our explanatory variables are dummies, and including lags of a large number of dummy variables creates a substantial amount of multicollinearity, making estimation infeasible. Therefore, to incorporate the possibility that certain variables may have an influence over a period of time rather than in

only one specific year and as a robustness test of our main specification, we consider a lag period of up to five years for those variables that are not coded as dummies.

Applying this methodology to our first dependent variable, JIDummy, we compute first differences of this dummy, which gives the change in a particular country at a specific point in time. For a given year, the resulting variable can be coded as 1 if the country included de jure JI in its constitution, –1 if it removed JI from its constitution, or as 0 if there was no change. Given the three distinct outcomes, we estimate the influence of explanatory variables with an ordered logit model, where larger (smaller) values imply an increase (decrease) in JI.

We proceed in a similar way with our second dependent variable, JIFactor, except that differencing now yields a metric variable, which allows applying standard regression estimation techniques.

To improve estimation efficiency and fully take into account possible collinearity among all potential explanatory variables, we follow Hendry (1993) and proceed from a general model to a specific one. Applying a consistent reduction test ensures that the reduced model is a more efficiently estimated and congruent representation of the general model.

6. Estimation Results for the Narrow Indicator of JI

Our estimation results for the narrow indicator of JI are summarized in Table 3. The first column reports the results from an ordered logit analysis employing as a dependent variable JIDummy. The explanatory variables are jointly significant at a 1% level of significance and generate a high pseudo-R^2 of 50% (see Lines 5 and 3, respectively). This fit does not derive from the time-based variables, which are jointly insignificant (see Line 5). Thus, there are no specific periods during our sample that are characterized by a significantly different number of changes in JI. In a rigorous testing-down process, we cannot reject the reduction restriction (see Line 6) and simplify the model to the one on the right-hand side of Table 3. Although much smaller, the reduced model still shows a high pseudo-R^2 of 42% and jointly significant variables. The superiority of the reduced model is confirmed by both the Akaike and Schwarz information criteria (see Line 4). Not all variables in the reduced model are individually significant but collinearity prevents simplifying the model further without violating the testing-down restriction.

Table 3: Explaining Changes in JIDummy (Ordered Logit Model)

	General model		Reduced model	
Variables	Coefficients	Standard errors	Coefficients	Standard errors
A) Political system indicators				
Constitution-related indicators:				
Year of new constitution	-0.02*	0.009	-0.01*	0.006
New constitution	-0.72	0.791		
First constitution	5.83***	1.276	4.73***	1.016
Degree of democracy:				
Degree of democratization	0.08	0.099		
Uncertainty about degree of democratization	0.004	0.003		
Democratic competition and participation	-0.10**	0.040	-0.09***	0.026
Change in types of political participation:				
Toward unregulated	n.a.			
Away from unregulated	-0.05	1.185		
Toward restricted	-0.12	1.620		
Away from restricted	4.35***	1.062	3.11***	0.863
Toward multiple identities	-2.12**	1.054	-0.45	0.812
Away from multiple identities	0.82	1.311		
Toward sectarian	-2.79*	1.565	-0.94	0.710
Away from sectarian	1.53	1.268		
Toward regulated	1.31	1.212		
Away from regulated	4.14***	1.589	2.44**	1.028
B) Political conflict indicators				
Political unrest:				
Change in government	0.48	0.664		
Assassinations	0.03	0.065		
General strikes	-0.19	0.355	-0.15	0.203
Guerrilla warfare	0.43**	0.187	0.21*	0.126

Government crises	-0.51*	0.300	-0.41*	0.219
Purges	0.36**	0.157	0.38***	0.117
Riots	-0.13	0.152		
Revolutions	0.33	0.429	0.16	0.383
Anti-government demonstrations	0.12	0.131		
External war:				
Currently involved in militarized interstate dispute	0.12	0.449		
Winner militarized interstate dispute	-1.37	1.065		
Loser militarized interstate dispute	-0.71	0.773		
C) Political leader indicators				
Leader's characteristics:				
Age when becoming leader	-0.004	0.024		
Female	2.11**	1.046	1.92**	0.896
Years as leader	-0.16***	0.054	-0.10***	0.037
Leader entering office:				
Leader reached power through regular means		Reference		
Leader reached power through irregular means	1.84**	0.852	1.71**	0.716
Leader directly installed by another state	-1.70	1.827		
Leader's loss of power:				
Leader lost power through regular means		Reference		
Leader died of natural causes while in power	-0.83	0.976		
Leader retired due to ill health	-4.27***	0.900	-3.01***	0.756
Leader committed suicide	-2.03	1.310		

Leader lost power through:				
Irregular means	-1.69**	0.788	-1.28*	0.760
Deposed by another state	1.00	1.152		
Still in power	0.97	1.150		
Within one year after leaving office:				
No noteworthy event		Reference		
Exile	2.99***	0.990	1.65***	0.587
Imprisonment	-0.84	1.318		
Death	3.32	2.824		
D) Socioeconomic indicators				
Demographic variables:				
Population growth	0.20	0.152		
Economic variables:				
Real GDP growth rate	5.41*	3.086		
Inflation rate	0.001	0.003		
Openness	0.02	0.014		
Government share in GDP	-0.27	2.484	-1.88	2.266
E) Time periods				
Year	0.01	0.102		
Period 1960s	0.60	1.617		
Period 1970s	0.56	2.189		
Period 1980s	-0.39	2.895		
Period 1990s	0.17	4.186		
Period 2000s	1.62	4.832		
Cut value 1	-32.96		-31.36	
Cut value 2	-16.58		-17.31	
(1) No. of observations	1609		1609	
(2) Log likelihood	-69.84		-82.3	
(3) Pseudo-R^2	0.50		0.42	
(4) Information criteria				
Akaike	246		207	
Schwarz	531		320	

(5) Tests of joint significance:		
All	$Chi^2(52) = 364$***	$Chi^2(19) = 163$***
Time variables	$Chi^2(6) = 2.1$	n.a.
(6) Testing-down restriction		$Chi^2(32) = 40$

Notes: All variables, except time periods and constitution-related indicators, enter the model lagged by one year and as first differences. Standard errors are robust to heteroscedasticity. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

To facilitate interpretation of the regression, we show average marginal effects of the significant variables from the reduced model in Table 4. Note that the estimated effects are symmetric in terms of size, that is, statistically, we cannot reject the hypothesis that the variables' effects on the probability of change apply to both adoption and removal of JI from the constitution with opposite signs. In the interpretation, we therefore concentrate on the effect a variable has on the probability of adopting de jure JI.

Table 4: Average Marginal Effects of Reduced Model in Table 3

	Including JI in constitution	No change	Removing JI from constitution
A) Political system indicators			
Year of new constitution	-0.0001**	0.00001	0.0001
First constitution	0.029***	-0.003	-0.025***
Democratic competition and participation	-0.001***	0.0001	0.001**
Change in types of political participation:			
Away from restricted	0.019***	-0.002	-0.016**
Away from regulated	0.015**	-0.002	-0.013*
B) Political conflict indicators			
Guerrilla warfare	0.001	-0.0002	-0.001*
Government crises	-0.003	0.0003	0.002
Purges	0.002***	-0.0003	-0.002**
C) Political leader indicators			
Female	0.012**	-0.001	-0.010*

Years as leader	-0.001**	0.0001	0.001**
Leader entering office:			
Leader reached power through irregular means	0.010***	-0.001	-0.009**
Leader's loss of power:			
Leader retired due to ill health	-0.018***	0.002	0.016**
Leader lost power through:			
Irregular means	-0.007	0.001	0.007
Within one year after leaving office:			
Exile	0.010***	-0.001	-0.009*

Notes: Reported figures are averages of marginal effects estimated for all existing values of the explanatory variables. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

Starting with the political system indicators, we find that the older a constitution, the less likely we are to observe a legal change toward explicitly including JI. Quantitatively, the effect is small. A one-year increase in the age of a constitution lowers the probability of such a revision by 0.01 percentage points. Thus, when comparing a 100-year-old constitution with a 1-year-old constitution, we find that the likelihood of a constitutional change toward including JI is 1 percentage point higher in the latter case.

A larger effect is found in the case of first constitutions. The likelihood of including JI in the first constitution of a country is almost 3 percentage points higher than in the case that the country has already adopted a new constitution in the past. This suggests that constitutional change is incremental in first constitutions, whereas the consideration of including JI has been already sufficiently discussed in the case that a new constitution was already adopted in a country sometime in the past.

Strong political competition significantly decreases the likelihood of JI being included in the constitution. The impact is quite small, though: a one unit greater change in political competition lowers the probability of including JI in the constitution by 0.1 percentage points. Thus, a one standard deviation increase in political competition decreases this probability by 0.3 percentage points. We interpret this finding as supporting our theoretical conjecture that greater fractionalization of political parties makes it more difficult to change the constitution.

A change in the prevailing type of political participation in a country also has a significant effect on the likelihood of including JI in the constitution. As shown in Table 4, the two individually significant effects are movements away from restricted and regulated systems of political participation. Changing the method of political participation so that it is less restricted and regulated increases the probability that JI will be included in the constitution by 2 and 1.5 percentage points, respectively. Although not precisely estimated, the coefficients for the other political participation variables support the interpretation that freer political participation is conducive to constitutional change involving JI.

Political conflict appears to be relevant to the inclusion of JI in the constitution. A change in two of the individually significant variables, guerrilla warfare and purges, increases this likelihood, whereas government crisis has a negative impact. One percent more guerrilla activity, purges, or government crisis changes the likelihood of including JI in the constitution by 0.1, 0.2, or 0.3 percentage points, respectively. The quantitative effects are very small: a change of these variables by one standard deviation affects the probability by about 0.2 percentage points. Arguably, changes in the number of government crises are an indication that the government is less able to act decisively to initiate constitutional change. In the case of an increase in the number of guerrilla activities and purges, the government appears to act in a more unitary fashion, implying that it may also be more able to carry out constitutional reform.

Our estimation results indicate that characteristics of political leaders are statistically significant. However, in terms of quantitative importance, the various individual characteristics do not have particularly strong effects. First, we find that under female leaders, it becomes more likely that JI will be included in an existing constitution; the probability increases by more than 1 percentage point. Second, more experienced leaders are significantly less likely to include JI in the constitution. One standard deviation more years in power as a leader lowers the probability of constitutional change by about 1 percentage point. Third, leaders entering office through irregular means are significantly more likely to amend the constitution by explicitly mentioning JI. Again, the increase in probability is about 1 percentage point. Fourth, the way a leader loses his or her power is important. In the aftermath of a leader retiring due to ill health, a change in the constitution becomes less likely by about 2 percentage points. If he or she lost power through irregular means, the probability of amending the constitution by referring to JI declines by almost 1 percentage point. We interpret these two finding as evidence that it is helpful to have a leader backing the constitutional change. If the leader has to step down unexpectedly because of health reasons, the constitutional reform project is more likely to stall. Fifth, if after losing power (in whatever way), the leader is forced into exile, the probability of constitutional change

increases by 1 percentage point. This suggests that the new leader is pointing the country in a different political direction, one that involves constitutional change.

In a next step, we analyze the potential impact of richer dynamics on the likelihood of including JI in the constitution by adding a lag period of up to five years for those variables not coded as dummies to the reduced model in Table 3. It is reassuring that none of the significant variables discussed above are seriously affected by this change in the specification.[6]

For each of these variables, we provide three types of information in Table 5: (i) whether the five-year lags are significantly different from zero, (ii) the net effect of the lag structure, and (iii) the net effect against zero.

Table 5: Explaining JIDummy: Dynamic Adjustment of Non-Dummy Variables

	Test of lags against zero	Net effect of coefficients	Test of net effect against zero
A) Political system indicators			
Degree of democracy:			
Degree of democratization	$Chi^2(5) = 3.3$	-0.23	$Chi^2(1) = 0.3$
Uncertainty about degree of democratization	$Chi^2(5) = 5.9$	0.01	$Chi^2(1) = 2.3$
Democratic competition and participation	$Chi^2(5) = 19$***	-0.01	$Chi^2(1) = 0.01$
D) Socioeconomic indicators			
Demographic variables:			
Population growth	$Chi^2(5) = 21$***	-0.04	$Chi^2(1) = 0.03$
Economic variables:			
Real GDP growth rate	$Chi^2(5) = 6.4$	16.33	$Chi^2(1) = 4.2$**
Inflation rate	$Chi^2(5) = 24$***	-0.11	$Chi^2(1) = 4.6$**
Openness	$Chi^2(5) = 6.2$	0.06	$Chi^2(1) = 1.8$
Government share in GDP	$Chi^2(5) = 6.7$	-8.49	$Chi^2(1) = 3.03$*

Notes: *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

[6] To conserve space, not all the coefficient estimates are set forth in Table 5; however, all omitted results are available on request.

We find that only lags of democratic competition, population growth, and inflation are jointly significant. However, in the first two cases, the net effect is not significantly different from zero. Inflation now has a statistically significant negative impact on the probability of including JI in the constitution. Studying the dynamic pattern in more detail reveals that the effect of the inflation rate on constitutional JI appears to have a three- to five-year transmission lag. Marginal effects for a 1 percentage point change in the inflation rate in the third and fifth lag are extremely small. The combined increase in the likelihood of including JI in the constitution is only 0.01 percentage points. Even a change by one standard deviation yields a probability impact of only 0.2 percentage points. Finally, we find that the net effect of real GDP growth has a significantly positive effect on the likelihood of constitutional change, and government share in GDP a significantly negative one. Thus, while including richer dynamics adds additional significant variables in the case of JIDummy, their economic impact appears to be limited.

7. Estimation Results for the Broad Indicator of JI

Next, we model JIFactor, our broad indicator of JI. Given that this variable is cardinally scaled as a result of the factor analysis, we can employ standard estimation techniques. Although all potential country-fixed effects have been removed, it is still possible that the error term is behaving non-spherically. In this case, applying OLS generates a biased estimation of standard errors and inefficient coefficient estimates. Therefore, we apply feasible generalized least-square (FGLS) panel data estimation techniques. Although this only guarantees consistent but not unbiased estimates, this should not be a problem in light of our large sample size.

Table 6 contains the estimates for the general and the reduced model. The general model is characterized by jointly significant variables and an overall R^2 of 12%, which is not bad for a model in first differences. In spite of some individually significant coefficients, we do not find a jointly significant impact of the time variables, which matches the outcome for the narrow indicator. We then simplify the model by excluding 28 variables and ensure that the testing-down restriction is not violated (see Line 6). The reduced model is given in the right-hand part of Table 6. The overall R^2 drops to 7%, but information criteria support the reduced model too (Lines 3 and 4, respectively). However, there is collinearity present between the remaining variables, as a number of them are not individually statistically significant. Given that our dependent variable is based on a factor analysis, the coefficients in Table 6 cannot readily be interpreted. Therefore, in Table 7, concentrating on the individually significant variables, we study the estimated effects with the help of standardized coefficients and elasticities.

Table 6: Explaining Changes in JIFactor (FGLS Model)

	General model		Reduced model	
Variables	Coefficients	Standard errors	Coefficients	Standard errors
A) Political system indicators				
Constitution-related indicators:				
Year of new constitution	-0.00004	0.0001	0.00003	0.0001
New constitution	0.07	0.093		
First constitution	0.05	0.123	0.133*	0.078
Degree of democracy:				
Degree of democratization	0.003	0.005		
Uncertainty about degree of democratization	0.0004	0.0003		
Democratic competition and participation	-0.001	0.001	-0.002*	0.001
Change in types of political participation:				
Toward unregulated	n.a.			
Away from unregulated	0.08	0.066	-0.021	0.026
Toward restricted	-0.03	0.038		
Away from restricted	0.18*	0.092	0.162*	0.086
Toward multiple identities	-0.09	0.057		
Away from multiple identities	0.07	0.060		
Toward sectarian	-0.13**	0.062	-0.082*	0.043
Away from sectarian	0.06	0.039		
Toward regulated	-0.04	0.069		
Away from regulated	0.08	0.061	-0.005	0.021
B) Political conflict indicators				
Political unrest:				
Change in government	-0.02	0.019		
Assassinations	0.01	0.005		
General strikes	0.0001	0.003	0.001	0.002
Guerrilla warfare	-0.003	0.003	-0.003	0.003

Government crises	-0.01	0.007	-0.005	0.007
Purges	0.001	0.004	0.001	0.003
Riots	-0.002	0.004		
Revolutions	0.002	0.008	0.005	0.007
Anti-government demonstrations	0.004	0.003		
External war:				
Currently involved in militarized interstate dispute	-0.01	0.009		
Winner militarized interstate dispute	0.04	0.038		
Loser militarized interstate dispute	0.02	0.041		
C) Political leader indicators				
Leader's characteristics:				
Age when becoming leader	0.0001	0.0004		
Female	0.02	0.013	0.024**	0.011
Years as leader	-0.001*	0.001	-0.001**	0.0004
Leader entering office:				
Leader reached power through regular means		Reference		
Leader reached power through irregular means	0.02*	0.013	0.015	0.013
Leader directly installed by another state	-0.08	0.071		
Leader's loss of power:				
Leader lost power through regular means		Reference		
Leader died of natural causes while in power	0.005	0.010		
Leader retired due to ill health	-0.03*	0.017	-0.038**	0.016
Leader committed suicide	0.02	0.030		

Leader lost power through:				
Irregular means	-0.01	0.010	-0.015*	0.008
Deposed by another state	0.03	0.017		
Still in power	-0.0004	0.021		
Within one year after leaving office:				
No noteworthy event		Reference		
Exile	0.02	0.011	0.017*	0.009
Imprisonment	-0.04	0.026	-0.039*	0.023
Death	-0.002	0.023		
D) Socioeconomic indicators				
Demographic variables:				
Population growth	0.001	0.002	-0.002	0.002
Economic variables:				
Real GDP growth rate	0.07	0.059	0.046	0.048
Inflation rate	0.0002	0.0002	0.0002	0.0002
Openness	0.0003	0.0004		
Government share in GDP	0.07	0.045	0.056	0.038
E) Time periods				
Year	0.002*	0.001		
Period 1960s	-0.02	0.022		
Period 1970s	-0.04*	0.024		
Period 1980s	-0.09**	0.041		
Period 1990s	-0.08	0.053		
Period 2000s	-0.09	0.064		
Constant	-4.47*	2.560	-0.038	0.140
(1) No. of observations	1487		1487	
(2) No. of countries	48		48	
(3) Overall R^2	0.12		0.07	
(4) Information criteria				
Akaike	11660		11613	
Schwarz	11909		11735	

(5)	Tests of joint significance:		
	All	$Chi^2(48) = 6.7e07$***	$Chi^2(23) = 148$***
	Time variables	$Chi^2(6) = 9.1$	n.a.
(6)	Testing-down restriction		$Chi^2(28) = 37$

Notes: All variables, except time periods and constitution-related indicators, enter the model lagged by one year and as first differences. Standard errors are robust to heteroscedasticity. *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively. Note that due to problems with computing the log likelihood, the information criteria are based on the residual sums of squares (see Bonate 2011).

We commence interpretation of the results with the political system variables and find that first constitutions contain more components relevant for a change in JI than constitutions in countries that adopted a new constitution some time ago in their history. Judging from the standardized coefficients, this is the largest effect of all explanatory variables. The marginal elasticity is fairly large but, given that this is a dummy variable, of little practical relevance. Studying the difference in effects of a first constitution compared to a constitution that replaced another one, we find a more than 60 percent higher value for the change in JIFactor. Thus, this variable is not only statistically significant but also highly relevant for explaining constitutional change.

An increase in the change of democratic competition significantly reduces the change in the degree of JI. However, its relative impact is small, as can be seen from the standardized coefficient. A 1 percent higher degree of democratic competition lowers the change in JIFactor by only 0.13 percent. More important are the effects associated with changes in the prevailing type of political participation. Specifically, moving away from a system of restricted political participation generates large effects. With a standardized coefficient of 0.14, it has the second largest impact on the change in the degree of JI and adopting a less restricted form of political participation increases the chance of changing JI by 77%, the greatest impact that we measure in our framework. Adopting a sectarian type of political system reduces the likelihood of change in JIFactor. This effect is fairly large compared to most of the other variables, but only half as large as that of moving away from a restricted system, as can be seen by the corresponding standardized coefficients and elasticities.

Table 7: Standardized Coefficients and Elasticities of Reduced Model in Table 6

	Standardized coefficient	Elasticities (in %) (at means)	Elasticities (in %) (dummy change)
A) Political system indicators			
First constitution	0.18	2.03	63.3
Democratic competition and participation	-0.04	-0.13	n.a.
Change in types of political participation:			
Away from restricted	0.14	0.94	77.3
Toward sectarian	-0.07	-0.53	-39.2
C) Political leader indicators			
Female	0.02	0.21	11.6
Years as leader	-0.05	-2.75	n.a.
Leader's loss of power:			
Leader retired due to ill health	-0.12	-3.85	-18.2
Leader lost power through:			
Irregular means	-0.02	-0.14	-7.3
Within one year after leaving office:			
Exile	0.04	1.02	8.2
Imprisonment	-0.08	-1.33	-18.6

Notes: Values are computed at means of variables.

The second and only other group for which we obtain individually significant coefficients is leader characteristics. Under female leaders, it is more likely that JI will be strengthened in the constitution. The impact is relatively small compared to that of other explanatory variables, though, as the standardized coefficient is only 0.02. Still, moving from a male to a female leader increases the change in JIFactor by roughly 12 percent.

The longer a leader is in office, the less likely he or she is to support a change toward more JI. The quantitative effect is sizeable, as one more year in power reduces the change in the broad JI indicator by almost 3 percent. For example, comparing a leader at the end of a typical second term of being in power with a newcomer, the former has a 30 percent lower probability of modifying the constitution toward JI.

The way a leader loses power plays a role as well. If the leader retires due to bad health, it is less likely that the change in JI is positive. With a value of –0.12, the standardized coefficient is relatively large in absolute terms. Comparing the situation of retirement due to bad health with other circumstances of retirement shows that the change in constitutional JI is almost 20 percent lower in such a situation. Change toward more JI is hindered when a leader loses power through irregular means. However, both in terms of standardized coefficient as well as in terms of elasticity, this effect is much smaller than the previous one. Our estimates suggest that the change in the broad JI indicator is about 7 percent lower. We think that the impact on JI of losing power due to health reasons or by irregular means bears some similarity to findings by Jones and Olken (2005), who use unexpected changes in leadership to identify leader effects on the economic outcome of a country. They report that such changes in leadership have a significant influence on economic growth. In our context, we derive a negative result, namely, that unexpected changes in leadership contribute to stalling constitutional reforms. Or, to put it in positive terms, the absence of unexpected shocks in leadership may be conducive to constitutional change.

What happens to the leader after he or she leaves office appears to be relevant too. Constitutional change toward more JI becomes more likely when the former leader is exiled, whereas his or her imprisonment has the opposite effect. The latter variable's influence (–0.08) is about twice as strong as the former's (0.04). An exiled leader increases the change in JIFactor by 8 percent and an imprisoned leader reduces it by 18 percent.

We again look at whether the lag structure of the non-dummy variables provides additional insight into determinants of change in JIFactor. Table 8 sets out the outcome of statistical tests after adding five lags to the reduced model in Table 6.[7] This modification in the model's

[7] To conserve space, not all the coefficient estimates are set forth in Table 8; however, all omitted results are available on request.

specification does not lead to notable changes in the impact of the variables discussed in Table 7.

Table 8: Dynamic Adjustment of Non-Dummy Variables from Reduced Model in Table 6

	Test of lags against zero	Net effect of coefficients	Test of net effect against zero
A) Political system indicators			
Degree of democracy:			
Degree of democratization	$Chi^2(5) = 3.0$	-0.01	$Chi^2(1) = 1.7$
Uncertainty about degree of democratization	$Chi^2(5) = 22.3$***	0.001	$Chi^2(1) = 5.7$**
Democratic competition and participation	$Chi^2(5) = 4.0$	0.0004	$Chi^2(1) = 0.01$
D) Socioeconomic indicators			
Demographic variables:			
Population growth	$Chi^2(5) = 2.6$	-0.002	$Chi^2(1) = 0.2$
Economic variables:			
Real GDP growth rate	$Chi^2(5) = 10.1$*	0.29	$Chi^2(1) = 4.0$**
Inflation rate	$Chi^2(5) = 12.9$**	-0.001	$Chi^2(1) = 2.1$
Openness	$Chi^2(5) = 7.8$	0.001	$Chi^2(1) = 0.9$
Government share in GDP	$Chi^2(5) = 10.7$*	-0.15	$Chi^2(1) = 1.1$

Notes: *, **, and *** indicate significance at a 10%, 5%, and 1% level, respectively.

Four variables are jointly significant: uncertainty about degree of democratization, real GDP growth, the inflation rate, and government share in GDP. Only in the case of changes in uncertainty about degree of democratization and GDP growth do we observe significant net effects, whereas the respective dynamics of the other two variables appear to neutralize their impact. Combining the estimated elasticities for the five lags yields a value of about 0.60 for both variables. However, the aggregated standardized coefficients are almost 0.70 in the case of political uncertainty but less than 0.20 in the case of real GDP growth. In terms of the underlying dynamics, we find that the most significant lag is the second for changes in political uncertainty and the fifth for the GDP growth rate. Our results for the democratic uncertainty indicator can be interpreted as providing some support for Ginsburg's (2002) "insurance theory of judicial independence." He argues that constitutionally anchored JI is more likely in conditions of political uncertainty, which is what we find. However, all in all,

these effects are not particularly large compared to our estimates in Table 7 and therefore we arrive at the same conclusion as in the previous section, namely, that allowing for higher dynamics can affect the results of single variables but does not change the general conclusion.

8. Conclusion and Outlook

In this paper, we identify the determinants of changes in constitutionally safeguarded JI based on a sample of as many as 100 countries and covering the period 1950 to 2005. Based on the rather sketchy theoretical literature, we propose four groups of explanatory factors related to political system, political conflict, political leader, and socioeconomic situation. We generate two alternative indicators for legal JI, a narrow one focusing on whether there is a passage referring to JI in the constitution, and a broad one generated by a factor analysis based on 29 aspects of a constitution that involve important dimensions of JI. Comparing the estimation results for the two indicators allows deriving robust conclusions about the importance of explanatory factors.

Both indicators for change in constitutional JI are significantly explained by a variety of explanatory variables. We find that the common determinants relate to political system and political leaders. Regarding the former, countries still operating under their original constitution are more likely to experience amendments introducing JI than are countries that adopted a new constitution sometime in the past. A second political system indicator refers to the degree of democratic competition and participation. We find that more political competition seems to undermine a country's ability or willingness to initiate constitutional change involving an increase in constitutionally anchored JI. A third indicator measures the prevailing type of political participation. If countries move toward more open forms of participation, specifically, if they move away from excluding significant groups, issues, and/or types of participation from the political process, the likelihood of constitutional change increases significantly.

The second group of variables contains characteristics of individual leaders. Under female leadership, it is more likely that constitutional change leading to higher JI will occur. The reverse is found for the length of time leaders have been in power: the longer they rule, the less likely we are to observe constitutional change involving JI. We find significant evidence that the way leaders lose power helps predict such changes: if a leader retires due to ill health or was ousted by irregular means, constitutional change becomes less likely. Finally, if one year after leaving office, the former leader is forced into exile, the chances of including JI in the constitution increase.

The remarkable finding that socioeconomic factors play a limited role at best is in accord with our previous findings regarding changes in the form of government (Hayo and Voigt 2012). Moreover, political conflict, measured by civil unrest as well as internal and external war, appears to play a rather limited role.

We find statistically significant evidence supporting the "insurance theory of judicial independence" (Ginsburg 2002), according to which higher levels of political uncertainty will cause higher levels of JI. Our dynamic estimates suggest that the greatest impact of political uncertainty on constitutional change occurs after two years. The combined elasticity of the political uncertainty indicator is 0.7, which is sizeable but certainly does not amount to a major driving force of constitutional reform.

Institutional economics, with its emphasis on institutional constraints, has been a huge success. However, its emphasis on the constraining—and enabling—role of institutions may be blinding it to the relevance of individuals and their concrete traits. The next step in economic research, not only with regard to the determinants of JI, thus might well be in the direction of complementing the institutional dimension with an individual dimension. Most of the variables connected with politicians do not refer to individual characteristics proper (with the exception of their gender, of course) but to specific events caused or suffered by them. But previous research shows that individual traits, such as education, can make an important difference. Thus these traits should also be taken into account in future research.

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Appendix 1: Variables for Factor Analysis (all coded as dummies)

(1) Judicial independence mentioned in constitution?

(2) Does the constitution provide for judicial opinions of the highest ordinary court?

(3–5) Which of the following aspects is mentioned about opinions for the highest ordinary court? (i) reasons are required in court decisions, (ii) dissenting opinions are allowed, and (iii) dissenting opinions are explicitly prohibited

(6) Judiciary nominates chief justice of the highest ordinary court?

(7) Judiciary approves of nominations for the chief justice?

(8) Chief justice must have a certain education?

(9) Chief justice must be a nonfelon?

(10) Chief justice must be a lawyer?

(11) All justices of highest ordinary court must be lawyers?

(12) To whom does the constitution assign the responsibility for interpretation of the constitution? Supreme court only

(13–15) Who has standing to initiate challenge to the constitutionality of legislation? (i) public (by complaint), (ii) lawyers, and (iii) courts

(16–18) What is the effect of a determination of unconstitutionality? (i) law is void, (ii) law is void for specific case, but remains on the books, and (iii) law is returned to legislature for revision/reconsideration

(19) Are there provisions for dismissing judges?

(20–21) Under what conditions can judges be dismissed? (i) crimes and other issues of conduct and (ii) incapacitated

(22) Who can propose the dismissal of judges? First (or only) chamber of the legislature

(23) Does the constitution explicitly state that judicial salaries are protected from governmental intervention?

(24–25) What is the maximum term length for the chief justice of the highest ordinary court? (i) 1 to 10 years or (ii) infinite

(26) What restrictions are in place regarding the number of terms the chief justice of the highest ordinary court may serve? Maximum of 6 terms

(27–28) What is the maximum term length for judges for the highest ordinary court? (i) 1 to 10 years or (ii) infinite

(29) What restrictions are in place regarding the number of terms members of the highest ordinary court may serve: (i) maximal 6 terms

JIFactor: Based on 29 variables (1)–(29)

JIFactorA: Based on 22 variables (1)–(6), (8)–(13), (16)–(17), (19)–(26)

JIFactorB: Based on 15 variables (2)–(4), (7)–(9), (10), (12), (19), (20)–(22), (24), (26)

Appendix 2: List of Variables

Age when taking office: Actual age of leader in the year when taking office; source: ARCHIGOS.
Anti-government demonstrations: Number of anti-government demonstrations in a specific year; source: Banks (2004, variable S18F1).
Assassinations: Number of assassinations in a specific year; source: Banks (2004, variable S17F1).
Currently involved in militarized interstate dispute: Dummy equal to 1 if a militarized interstate dispute takes place in the current year; source: Correlates of War Project.
Degree of democratization: Revised Combined Polity Score with a scale ranging from +10 (strongly democratic) to –10 (strongly autocratic); source: Marshall and Jaggers (2002).
Democratic competition and participation: The percentage of votes not cast for the largest party (competition) times the percentage of the population that actually voted in the election (participation). This product is divided by 100 to form an index that in principle could vary from 0 (no democracy) to 100 (full democracy); source: Vanhanen (2000, 2005).
Dependent territory lost: Impulse dummy equal to 1 if a country lost dependent territory to its adversaries after a militarized interstate dispute in the current year; source: Correlates of War Project.
Dependent territory won: Impulse dummy equal to 1 if a country won dependent territory from its adversaries after a militarized interstate dispute in the current year; source: Correlates of War Project.
End of militarized interstate dispute: Impulse dummy equal to 1 if a militarized interstate dispute ends in the current year; source: Correlates of War Project.
First constitution: Impulse dummy equal to 1 if a new constitution is the first constitution of a state; source: Widner.
Female: Dummy equal to 1 if current leader is female; source: ARCHIGOS.
General strikes: Number of general strikes in a specific year; source: Banks (2004, variable S17F2).
Government crises: Number of government crises in a specific year; source: Banks (2004, variable S17F4).
Government share in GDP: Share of government expenditures in GDP in %; source: Heston et al. (2006), own computations.
Guerrilla warfare: Number of armed activities aimed at the overthrow of present regime in a specific year; source: Banks (2004, variable S17F3).
Homeland territory lost: Impulse dummy equal to 1 if a country lost homeland territory to its adversaries after a militarized interstate dispute in the current year; source: Correlates of War Project.
Homeland territory won: Impulse dummy equal to 1 if a country won homeland territory from its adversaries after a militarized interstate dispute in the current year; source: Correlates of War Project.
Inflation rate: Rate of change of GDP deflator in PPP units; source: Heston et al. (2006), own computations.
Intermediate internal armed conflict: Intermediate internal armed conflict; source: Gleditsch et al. (2002).
Initiators of constitutional change: Dummy variables indicating whether legal initiative for constitutional change comes from executive, legislative, referendum, or constitutional assembly/convention.
Minor internal armed conflict: Minor internal armed conflict; source: Gleditsch et al. (2002).
Internal war: Internal war; source: Gleditsch et al. (2002).

Knowledge distribution: Combination of the arithmetic mean of the number of students at universities or other institutions of higher education per 100,000 inhabitants of the country and literates as a percentage of adult population; source: Vanhanen (2000, 2005).
Leader committed suicide: Dummy equal to 1 if a leader committed suicide while in office; source: ARCHIGOS.
Leader died of natural causes while in power: Dummy equal to 1 if a leader died while in office; source: ARCHIGOS.
Leader directly installed by another state: Dummy equal to 1 if a leader took office through direct intervention of another state; source: ARCHIGOS.
Leader lost power through regular means: Dummy equal to 1 if a leader left office through regular means; source: ARCHIGOS.
Leader lost power by being deposed by another state: Dummy equal to 1 if a leader left office after direct intervention by another state; source: ARCHIGOS.
Leader lost power via irregular means: Dummy equal to 1 if a leader left office through irregular means; source: ARCHIGOS.
Leader still in office: Dummy equal to 1 if a leader is still in office; source: ARCHIGOS.
Leader attained power through regular means: Dummy equal to 1 if a leader took office through regular means; source: ARCHIGOS.
Leader attained power through irregular means: Dummy equal to 1 if a leader took office through irregular means; source: ARCHIGOS.
Leader retired due to ill health: Dummy equal to 1 if a leader retired early from office because of ill health; source: ARCHIGOS.
Loser militarized interstate dispute: Impulse dummy equal to 1 if a country loses a militarized interstate dispute in the current year; source: Correlates of War Project.
New constitution: Impulse dummy equal to 1 if a new constitution comes into existence in the current year; source: Widner.
Openness: Exports plus imports divided by GDP in %; source: Heston et al. (2006).
Political participation—multiple identities: Relatively stable and enduring political groups compete for political influence at the national level—parties, regional groups, or ethnic groups that are not necessarily elected, but that have few recognized, overlapping (common) interests; source: Marshall and Jaggers (2002).
Political participation—regulated: Relatively stable and enduring political groups regularly compete for political influence and positions with little use of coercion. No significant groups, issues, or types of conventional political action are regularly excluded from the political process; source: Marshall and Jaggers (2002).
Political participation—restricted: Some organized political participation is permitted without intense factionalism, but significant groups, issues, and/or types of conventional participation are regularly excluded from the political process; source: Marshall and Jaggers (2002).
Political participation—sectarian: Political demands are characterized by incompatible interests and intransigent posturing among multiple identity groups and oscillate more or less regularly between intense factionalism and government favoritism; source: Marshall and Jaggers (2002).
Purges: Number of systematic eliminations of political opposition in a specific year; source: Banks (2004, variable S17F5).
Real GDP growth rate: Growth rate of real gross domestic product per capita in U.S. dollars converted using PPP in %; source: Heston et al. (2006), own computations.
Real GDP: Real gross domestic product per capita in U.S. dollars converted using PPP; source: Heston et al. (2006).
Revolutions: Number of successful or unsuccessful revolutionary actions in a specific year; source: Banks (2004, variable S17F7).

Riots: Number of riots in a specific year; source: Banks (2004, variable S17F6).
Share of family farms: The area of family farms as a percentage of total cultivated area or total area of holdings; source: Vanhanen (2000, 2005).
Share of urban population: Urban population as a percentage of total population; source: Vanhanen (2000, 2005).
Start of militarized interstate dispute: Impulse dummy equal to 1 if a militarized interstate dispute starts in the current year; source: Correlates of War Project.
Uncertainty in the degree of democratization: The conditional variance of the combined Polity Score estimated in the framework of a GARCH(1,1) model; source: Marshall and Jaggers (2002), own computations.
Winner militarized interstate dispute: Impulse dummy equal to 1 if a country wins a militarized interstate dispute in the current year; source: Correlates of War Project.
Within one year after leaving office—death: Dummy equal to 1 if within one year after leaving office the former leader is killed; source: ARCHIGOS.
Within one year after leaving office—exile: Dummy equal to 1 if within one year after leaving office the former leader is exiled; source: ARCHIGOS.
Within one year after leaving office—imprisonment: Dummy equal to 1 if within one year after leaving office the former leader is imprisoned; source: ARCHIGOS.
Within one year after leaving office—no noteworthy event: Dummy equal to 1 if within one year after leaving office no negative events happen to the former leader; source: ARCHIGOS.
Year: Year ofobservation.
Years as leader: Number of years the current leader has been in office; source: ARCHIGOS.
Year with change in leader: Impulse dummy equal to 1 if a country undergoes a change in leadership in the current year; source: ARCHIGOS.
Year of new constitution: Year when the current constitution was adopted; source: Widner.