

Economic Growth and Judicial Independence: Cross Country Evidence Using a New Set of Indicators

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Abstract

Interest in the possible relationship between economic freedom and economic growth has burgeoned in recent years and most studies have found economic freedom to be conducive to economic growth. Yet, economic freedom is a broad concept that includes very different aspects. The rule of law is a precondition for a high degree of economic freedom. In this paper, it is therefore asked whether a crucial aspect of the rule of law – judicial independence – is also conducive to economic growth. Two indicators of judicial independence are introduced: (i) a *de iure* indicator focusing on the legal foundations of judicial independence and (ii) a *de facto* indicator focusing on the factually ascertainable degree of judicial independence. An econometric model is estimated on the basis of data from 65 countries. While *de iure* judicial independence does not have an impact on economic growth, *de facto* judicial independence positively influences real GDP growth per capita in a sample of 56 countries.

Keywords: Economic Growth, Rule of Law, Judicial Independence

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1 Introduction

Thriving market economies depend on strong states that secure private property rights and their voluntary transfer. Yet, the strength of the state can be its greatest weakness: if it is strong enough to secure private property rights, it could also be strong enough to attenuate them or even to expropriate its citizens (Weingast 1993). A simple promise to honor private property rights in the future will not be credible: the citizens know that after they have invested, the state has an incentive not to keep its promises. In such a setting, an independent judiciary could make all actors better off: if it is able to make the representatives of the state stick to their promises, additional investment could not only lead to higher income and growth but also to higher tax receipts of the state.

It would thus seem that rational politicians should have introduced judicial independence for long. But simply promising an independent judiciary might not be sufficient to induce additional investment: as long as potential investors do not believe that the judiciary will really be impartial, they might not change their investment behavior. It thus seems to make sense to distinguish two kinds of judicial independence (JI), namely *de iure* and *de facto* JI. Whereas *de iure* JI can be derived from looking at the letter of the law, *de facto* JI is the independence factually enjoyed by judges and justices which will be the result of their effective term lengths, of the degree to which their judgments have an impact on government behavior etc.

In this paper, it is analyzed whether judicial independence is also conducive to economic growth. Two indicators of judicial independence are introduced: (i) a *de iure* indicator focusing on the legal foundations of judicial independence and (ii) a *de facto* indicator focusing on the factually ascertainable degree of judicial independence. For a sample of 65 countries an econometric model is estimated according to which real GDP growth per capita between 1980 and 1998 is explained by judicial independence and standard controls. While *de iure* judicial independence does not have any impact on economic growth, *de facto* judicial independence

positively influences GDP growth. The model is extended by checking the robustness of the results to proxies for economic freedom, legal origin of a country and political stability.

The remainder of the paper is organized as follows: *Section 2* elaborates possible consequences of JI on economic growth in a little more detail. In *Section 3*, a short overview of the approaches used to measure the JI is given. *Section 4* presents the two indicators. In *Section 5*, the econometric model is introduced, *Section 6* contains the discussion of the econometric analysis, and *Section 7* concludes.

2 The Crucial Importance of Judicial Independence for Economic Growth and Development

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 whom implementation depends. It would further imply that judges – apart from their decisions not being implemented – do not have to anticipate negative consequences as the result of their decisions, such as (a) being expelled, (b) being paid less, or (c) being made less influential.

Three archetypical interaction situations in which JI is important can be distinguished:

- (1) *In cases of conflict between citizens*: If contracting parties voluntarily entered into a contract and one of the parties believes that the other side hasn't lived up to the contract, impartial dispute resolution is important. As long as both sides expect the judiciary to be impartial, they can save on transaction costs while negotiating the contract. On average, lower transaction costs will lead to more welfare-enhancing transactions taking place.
- (2) *In cases of conflict between government and the citizens*, the citizens are in need of an organization that can adjudicate who is right, i.e. who has acted according to the law. The judiciary will not only have to ascertain the constitutionality of newly passed legislation but also to check whether the representatives of the state have followed the procedural devices that are to safeguard the rule of law. If the judiciary is not independent from executive and legislature, citizens will not trust in the relevance of the rule of law.
- (3) *In cases of conflict between various government branches*: In the absence of an impartial arbiter, conflicts between government branches are most likely to develop into power games. An independent judiciary can keep them within the rules laid out in the constitution.

Among the many functions of government, the reduction of uncertainty is of paramount importance. But the law will only reduce uncertainty if the citizens can expect the letter of the law to be followed by government representatives. An independent judiciary could thus also be interpreted as a device to turn promises – e.g. to respect property rights and abstain from expropriation – into credible commitments. If it functions like this, citizens will develop a

longer time horizon which will lead to more investment in physical capital but also to a higher degree of specialization, i.e., to a different structure of human capital. All this means that JI is expected to be conducive to economic growth.

3 Approaches Used to Measure Judicial Independence and Its Effects on Economic Growth

Research concerning the possible impact of economic freedom on economic growth got a boost with the publication of the Economic Freedom Index (EFI; Gwartney, Lawson, and Block 1996). The EFI contains some variables that capture important aspects of the rule of law in general and judicial independence in particular. Part five of the components of the index is entitled „Legal Structure and Property Rights“ and consists of two components, namely the legal security of private ownership rights and the “Rule of Law: Legal Institutions, Including Access to a Nondiscriminatory Judiciary That Are Supportive of the Principles of Rule of Law.” Data for this variable are provided by the publishers of the International Country Risk Guide (ICRG) an organization, which sells information to private firms interested in business relations. Though the data are certainly very interesting, they do have their shortcomings. ICRG generates these data by relying on expert opinions. Nobody answering to these polls has a complete picture of all the countries surveyed. The grades attributed to the countries depend on the expectations one has with regard to them. These will be influenced (a) by the home countries of those being polled and (b) by what those being polled have heard about the country before. Subjective measures thus contain the risk of reverse causation: performance perceptions might bias the ratings given by those asked.

Apparently, Gwartney et al. (2000, 236) are not entirely satisfied with the data provided by ICRG. They write: “Because the ICRG ratings inexplicably increase from the mid-1990s to late 1990s, all ratings were adjusted using the maximum and minimum procedure used in other components in order to make the component consistent over time.” This trend might have been the reason for the organization producing the ICRG not to include exactly the question that has been used as a proxy for the rule of law in the past in its surveys any longer.

Nevertheless, Knack and Keefer (1995) find that the ICRG index is correlated with economic growth in a statistically significant way. Increasing the index by one standard deviation would lead to an annual increase in expected growth of 1.2 percentage points. De Haan and Sturm (2000) emphasize that the relationship between the level of economic freedom and the growth rate of real per capita GDP is not robust, while changes of economic freedom have a robust positive effect on per capita GDP growth.

In contrast to these studies, Brunetti, Kisunko and Weder (1998) are interested in the credibility of the respective rule set perceived by local entrepreneurs. *Prima facie*, their approach is quite convincing: it is the locals who have to live with the respective rules on a daily basis. It is furthermore their perceptions of this rule set that is decisive for their business decisions.

Yet, in addition to the problems connected with subjective indicators just alluded to, this approach is based on an implicit hypothesis which would seem to be highly controversial: focusing exclusively on the formal credibility of a rule set would mean that its material content can safely be neglected which is a very far-reaching hypothesis. Brunetti et al. (1998) argue that subjective measures of uncertainty are superior to objective measures because these would not measure uncertainty but instability.

In this paper, we introduce a set of indicators that is as objective as possible. It is not based on any subjective evaluations and can thus be replicated by anybody interested in doing so. This is clearly not the case for the ICRG and similar measures such as those provided by Freedom House (published annually) or the Heritage Foundation/Wall Street Journal (also published annually). The components making up our indicator of judicial independence reflect the major aspects one has conventionally in mind when talking about these concepts. Since the two indicators introduced here are restricted to judicial independence, the number of aspects included is a lot higher than in other broader indices. A third advantage of the indicators introduced here is that they clearly distinguish between *de iure* und *de facto* JI. If there is a divergence between the two, institutional economists would be interested in pinning down the factors explaining the divergence.

4 Introducing Two New Indicators

4.1 Why Focus on the Highest Courts?

The focus of our analysis is on a measure of the independence of an entire government branch. In many states, this branch is made up of thousands of decision-makers. Often, there is an elaborate division of labor between specialized courts. In federal states, there is usually a state judiciary, which is separate from the federal one. In short, complexity needs to be radically reduced.

We therefore propose to focus on just one court for every country, namely its highest court. Regardless of whether it deals exclusively with constitutional issues (as, e.g., the German Constitutional Court) or whether it is the Supreme Court for all areas of law (as, e.g., the U.S. Supreme Court), it will deal with interpreting the Constitution. If the Constitution is viewed as the most basic rule set of a state, its interpretation will be of great importance. The court system is organized hierarchically, with the higher courts being able to overrule the sentences of the lower courts. It is therefore the independence of the highest court that is important for the degree of judicial independence observed in a polity.

4.2 *A de iure* Indicator for Measuring Judicial Independence

This measure is solely based on the legal foundations as found in legal documents.¹ We draw on 23 characteristics grouped into twelve variables in order to assess JI. Each of the twelve variables can take on values between 0 and 1 where greater values indicate a higher degree of JI. A country with a maximum degree of JI could thus get a sum of 12. Unfortunately, for some of the countries included in this sample, we were not able to get data for all 12 variables. We therefore decided to divide the sum of the coded variables by the number of variables for which data was available. The indicator can thus take on any value between 0 and 1. Here is a list of the 12 variables and the reasoning used for coding them:

- (1 and 2) The independence of judges is dependent upon the stability of the set of institutional arrangements within which they operate. Formally, the stability of the powers and procedures of the court depend 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. This does only hold, however, if a majority is needed to change the constitution, which is more inclusive than that which is needed 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 appointment procedure of the judges may have a notable effect on the independence of the court. As it is *inter alia* supposed to protect citizens from illegitimate use of powers by the authorities as well as to settle disputes between the branches of government, it ought to be as independent as possible from the other branches. We hypothesize that the most independent procedure for judicial appointment is by professionals (other judges or jurists). The least independent method is appointment by one powerful politician (the prime minister or the minister of justice, e.g.).
- (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 terms are renewable because they have an incentive to please those who can reappoint them.
- (7) Further, if their salaries are determined by the members of one of the other government branches, this raises incentives to take the preferences of these members explicitly into

1. For a more detailed description of the survey, the data underlying the indicators of judicial independence and the coding of the different variables see Voigt (2001). The full text of the questionnaire on which the two indicators are based is reprinted in the appendix. The appendix also includes the detailed coding of the two indicators of judicial independence.

account. General rules that their salary cannot be reduced increase, in turn, the independence of the judiciary.

- (8) Additionally, judges need to be paid adequately in comparison with other jobs that qualified lawyers can exercise such as practicing as a private lawyer or teaching as a university professor.
- (9) Another component of judicial independence is the accessibility of the court and its ability to initiate proceedings. A court which is accessible only by a certain number of members of parliament or other officials will be less effective in constraining government vis-à-vis its citizens than a court, which is accessible by every citizen who claims that her rights are violated.
- (10) If the allocation of cases to the various members of the court is at the discretion of the chief justice, his influence will be substantially greater than that of the other members of the court. It follows that in such an institutional environment, it could be interesting to try to “buy” just the chief justice. We expect independence to be larger if there is a general rule according to which cases are allocated the responsibility of single members of the court.
- (11) The competencies assigned to the constitutional court do not bear directly on its independence. Yet, highest courts must have certain competencies in order to be able to check the behavior of the other government branches. If the constitution is interpreted as the most basic formal layer of rules that is to restrain (and to enable) government, then constitutional review, i.e. the competence of the court to check whether legislation is in conformity with the constitution is crucial.
- (12) If courts have to publish their decisions, they can be scrutinized by others and the reasoning can become subject to public debate. This can be interpreted as making it more difficult for representatives of the other government branches to have irrelevant considerations influence their decisions. The transparency will be even higher if the courts publish dissenting opinions.

4.3 A *de facto* Measure for Judicial Independence

We now turn to possible ways of measuring JI not as it is written down in legal documents but as it is factually implemented. As with regard to the *de iure* indicator, no one single proxy adequately reflects all relevant aspects of JI. To assess *de facto* JI, eight variables have been 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 iure* indicator is based on various legal documents. Even if they are changed frequently, exact values can be calculated for every single point in time, depending on the formal

validity of the respective documents. This does not hold for *de facto* JI. The factual term length of Highest Court judges cannot be calculated right after a new constitution has been passed but will be the result of years of living with the legal documents. We therefore base the *de facto* indicator on quite a long period, namely that between 1960 and today. This means, of course, that the indicator will be very sticky in comparison to the *de iure* indicator. Some respondents simply did not answer to the second part of the questionnaire because they believed it did not apply to their countries. The countries of Central and Eastern European are a case in point here: all of them passed new constitutions after 1990. According to the time span proposed by our indicator, the treatment of the judiciary by socialist regimes still weighs heavily on today's *de facto* values. We chose this approach because we think the past matters for how JI is evaluated by citizens and other potential investors. A government – or more broadly: a regime – will not be able to build up a reputation as law-abiding or JI-respecting overnight. Here is a list of the eight variables and the reasoning used for coding them:

- (1 – 3) A crucial aspect of the *de facto* JI will be the effective average term length of the members of the highest court. For coding, we simply multiplied the effective average term length in years with 0.05. In other words: a country gets the highest possible rating if the average term length is twenty years (or more). If the actual term length and the one to be expected on the basis of the legal foundations deviate, the country is coded 0 in the following variable. Removing a judge before the end of term is a serious breach of JI. Whenever that has occurred at least once, the country is coded 0 for that variable.
- (4) The influence of a judge depends on the number of other judges who are members of the same court. By increasing the number of judges, the weight of those judges who do not decide along the lines of the preferences of the median members of the other branches can supposedly be diminished. This is exactly what President Roosevelt had in mind with his plan to “pack” the Supreme Court. It was thus asked how many times the number of judges had been changed since 1960.
- (5 – 6) The importance of an adequate income was already discussed with regard to the *de iure* indicator. With regard to the *de facto* situation, we are interested to learn whether the incomes of judges have at least remained constant in real terms. But the efficacy of courts does not only depend on the income level of judges but also on the number of clerks employed, the size of the library, the availability of modern computer equipment etc. We have tried to take this aspect into account by asking for the development of the court's budget as an organization.
- (7) Any change in the basis of the legal foundation of the highest court will increase uncertainty among its potential users, i.e. will be counter to one of the most fundamental functions of the law. Frequent changes of the respective legal rules are here interpreted as an indicator for low *de facto* independence.

- (8) The *de facto* degree of judicial independence is low if decisions of the highest court, in order to be implemented, depend on some action of one (or both) of the other branches of government and this cooperation is not granted. The more frequently this has been the case, the less independent is JI supposed to be factually.

The *de iure* indicator has been calculated for 75 countries. Getting data for the *de facto* indicator is more difficult than for the *de iure* indicator. In order to ensure a minimum amount of accuracy, countries were only ranked if a minimum of three variables could be coded. This explains the lower number of countries ranked here (namely 66). Information was enquired by country experts via a questionnaire that was e-mailed to them jointly with a short paper explaining purpose and hypotheses of the enterprise. For filling in the questionnaire, the country experts did not have to make personal evaluations of the situation in the country, but were asked to simply give information on the legal structure of the judiciary. Among the country experts are Supreme Court judges, law professors, lawyers but also activists from organizations such as Transparency International. Mails were sent to far more than 75 experts but many recipients never answered or promised to fill in the questionnaire later. The choice of countries could be called “biased random” due to a number of factors: contacts to legal experts are not equally spread around the world, use of e-mail is also not equally distributed around the world. But cultural factors might also play in. The Far East and Africa are clearly underrepresented in our study.

4.4 A Comparison of Indicators

The ranking of countries according to the *de iure* index (*Appendix 2*) surely contains more than one surprise: among the nine top-scoring countries, there is not one single OECD-member. Long established democracies with affluent economies such as the U.S. or Switzerland fare rather badly: the U.S. is ranked 30th, Switzerland with its 67th rank even belongs to the lowest-ranked quintile. However, this ranking solely reflects JI as it is written down in various legal documents. Politicians all over the world have incentives to promise to their citizens that the judiciary will be independent. Most of the top-ranked countries have, e.g., close ties with the U.S. and U.S.-American legal thinking, which emphasizes the importance of judicial independence.² Large parts of Georgia’s Constitution were drafted by law professors from the Chicago Law School. It is not astonishing that they put heavy emphasis on the formal independence of the judiciary. What will be more interesting therefore is to inquire whether the *de facto* indicator reflects a similar ranking or whether the two indicators diverge.

2. These countries outrank the U.S. because some of the competencies that the U.S. Supreme Court factually holds – such as constitutional review – only emerged over time but are not fixed in the constitution. Most of the more recent constitutions incorporate this competence on the constitutional level.

There is indeed a notable divergence between both indicators of judicial independence. Not a single country in the ‘Top Ten’ of the *de iure* JI index is in the ‘Top Ten’ of the *de facto* JI index. Moreover, like in the case of the *de iure* index, the ranking of the *de facto* index is rather unexpected: The good results of Armenia and Kuwait in the ranking (*Appendix 3*) can probably be made plausible by the low number of variables used (namely 3), but this does not explain the good ranking of, say, Turkey (six variables) or Taiwan (eight). On the other hand, the good ranking of Switzerland as well as the fact that there is no EU member state among the lowest quintile conforms more strongly to common prejudices. Among the lowest quintile are only one OECD-member (the Czech Republic which has been a member since 1995), but some of the East European and African states that one would intuitively expect to fare badly.

It cannot be completely excluded that some questionnaire respondents pursue their own agenda and have an incentive to make reality fit to it: a loyal citizen could try to make his country look better than it really is whereas a political activist striving for improvement might try to make her country look worse than it really is. Respondents may have a tendency to give the ‘socially desired’ answers.

It must be noted that in principle, a judiciary that scrupulously follows the wishes of – say – the executive could score very well in the *de facto* score: a dictator could nominate one’s family and friends as judges; as long as they conformed to his wishes, he would not have any incentives to kick them out of office, to reduce their salary or the budget of the court etc. This can indeed not be entirely excluded. The question would be as to what aspects we could check for in order to insure that this is not the case. The number of laws struck down by the highest court as unconstitutional (may be as a proportion of all laws passed) is not a good proxy for a number of reasons: (i) often, the highest court does not have the competency to initiate constitutional review; it thus depends on others initiating this process; (ii) the legislature will not naïvely maximize the utility of its median member but will try to anticipate the position of the court and will subsequently adjust its own position in order not to be called back by the court.³ In that sense, a law that is struck down by the court represents an expression of faulty expectations concerning jurisdiction by the majority of the legislature.

We now turn to discussing the correlation with various indicators that serve similar purposes (*Table 1*). The ICRG data have already been mentioned above. We use them as they are reprinted by the authors of the Economic Freedom Index (Gwartney, Lawson, and Samida 2000). Unfortunately, this means that they have already been corrected.⁴ It is still astonishing

3. Voigt (1999) explores the relevant strategic interactions between the members of the three government branches in more detail.

4. Ratings for some countries rated here were not provided for by ICRG: Estonia and Lithuania were rated on the basis of Poland and Russia, Slovenia on that of the Czech Republic and Slovakia. Another country for

that the correlation with our *de iure* indicator does not even have a positive sign; this is the case with the correlation between our *de facto* indicator and the ICRG data but the correlation is less from being perfect even then. Something similar happens with the data provided by the Economist Intelligence Unit (EIU) that are supposed to proxy for the transparency and accountability of the legal systems of 60 countries. Again, the correlation with the *de iure* index does not have a positive sign, while the one with our *de facto* indicator does.

Table 1: Correlation Matrix of the Indicators of Judicial Independence with Other Indicators

	<i>De iure</i>	<i>De facto</i>	ICRG	EIU	Freedom House	Heritage/Wall Street Journal	Smithey
<i>De iure</i>	1						
<i>De facto</i>	0.141	1					
ICRG	-0.167	0.527	1				
EIU	-0.063	0.374	0.619	1			
Freedom House	-0.076	-0.291	-0.476	-0.790	1		
Heritage/Wall Street	-0.153	-0.339	-0.607	-0.840	0.721	1	
Smithey	-0.258	0.277	-0.007	-0.170	0.068	0.334	1

Notes: ICRG is the Economic Freedom Index (Gwartney, Lawson, and Samida 2000); EIU is an index on the basis of data provided by the Economist Intelligence Unit on transparency and accountability of the legal systems; Freedom House represents the civil liberties on a scale between 1 and 7 where 1 represents the best possible value. Note that a negative sign with the other indicators stands for a positive correlation. Heritage/Wall Street Journal is another index of economic freedom. The variable used here is the one on property rights. The rights are on a scale between 1 and 5 where 1 stands for the highest possible value (correlations should thus have a negative sign safe for the one with the Freedom House data) and ‘Smithey’ is the shorthand for the various degrees of ‘judicial power and independence’ chosen in the transition countries of Central and Eastern Europe as reported and calculated by Smithey and Ishiyama (2000).

‘Smithey’ is the shorthand for a paper by Smithey and Ishiyama (2000) who try to explain the various degrees of ‘judicial power and independence’ chosen in the transition countries of Central and Eastern Europe. They construct a ‘judicial power score’ that has some similarities with the one constructed here. It is very surprising that it is negatively correlated with our *de iure* score whereas it is positively correlated with our *de facto* score. Part of the problem might be the small sample overlap: data from both sets exist for only 14 countries.

Many correlation coefficients are very low which is irritating at first sight. It can be argued however that the various indicators measure different things. If the correlation between these

which we provide original data was scored according to the ratings of apparently similar countries, namely Mauritius on that of Botswana.

indicators is relatively low, it simply means that the relationship is not as straightforward as sometimes assumed. But let us now turn to an econometric analysis of the impact of judicial independence on economic growth.

5 Estimation Approach and Data Description

The workhorse for the empirical analysis is an equation that de Haan and Sturm (2000) call ‘a variant of the Extreme Bounds Analysis (EBA)’ (p. 228) with the difference that we do not report the extreme bounds but different estimation results providing for the extreme bounds. According to this approach the following equation is estimated:

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

where ΔY_i is average real GDP growth per capita of country i between the years 1980 and 1998, M_i is a vector of standard explanatory variables of country i , JI_i are the *de iure* and *de facto* indicators of judicial independence in country i , Z_i is a vector of additional explanatory variables in country i that are introduced to check the robustness of the baseline model, and ε_i is an error term.

Average real GDP growth per capita is obtained from the new Penn World Tables Version 6.0 (Heston, Summers and Aten 2001) which has been authorized for use in the end of December 2001. The data set poses however particular problems with respect to Eastern European countries. Since the data of these countries in the nineties are not comparable to data in the eighties or do even not exist for the eighties because these are newly created states, real GDP growth per capita had to be averaged for these countries depending on the first date GDP data are available instead of averaging it for the time period 1980 to 1998.⁵ The use of the PWT 6.0 data set reduces the sample from 75 countries covered by the *de iure* index and 66 countries covered by the *de facto* index to 65 and 56 countries respectively. Compared to Appendix 2 and 3, the countries Bahamas, Croatia, Cyprus, Kuwait, Montenegro and Vanuato had to be excluded from the sample.

The vector M_i consists of three variables, which are robustly linked to economic growth according to previous studies (see de Haan and Sturm 2000). These variables are the level of initial real GDP per capita (in our sample, ‘initial’ is 1980), private and public investment in

5. Real GDP growth per capita is averaged in the following way: Slovak Republic 1987 to 1998, Czech Republic and Slovenia 1990 to 1998, Bulgaria and Russia 1991 to 1998, Armenia 1992 to 1998, Estonia and Lithuania 1993 to 1998, Azerbaijan and Kazakhstan 1994 to 1998 and Georgia 1996 to 1998. Germany is coped with by using a ‘smoothing algorithm’ for the structural shift between West German and Unified German growth data. Real GDP growth per capita thus reflects less and less the long run growth rate that is supposed to be measured according to the underlying growth theory. This is particularly problematic in the case of Georgia.

percent of GDP averaged over the period 1980 to 1998, and the percentage of secondary school attained in the total population aged 15 and more in 1980. With the exception of the latter variable, which is from the Barro and Lee data set, these data are from the PWT 6.0.

The additional economic variables making up for the vector Z_i are average government consumption in percent of GDP between 1980 and 1996, openness measured by the sum of exports and imports in percent of GDP, average population growth between 1980 and 1998, and the average inflation rate, all from the PWT 6.0 data set. The reasoning for an inclusion of these variables for testing robustness of the impact of judicial independence stems from a whole bunch of empirical growth studies. Again, de Haan and Sturm (2000) provide an excellent selective survey on these arguments. In addition to these standard additional variables, the economic freedom indices are included for robustness checks in order to find out whether the impact of JI still holds if variables are included that may partly incorporate JI as a component. Since these economic freedom indices are not yet fully available after 1990 the sample used is reduced further to 42 countries. Moreover, the data by La Porta et al. (1999) on the legal origin of countries as well as the political stability data by the World Bank (2001) are used to test robustness of the growth impact of JI to the legal and political environment.

The empirical strategy is following along the lines underlying the model described above. First, the baseline regressions are performed adding the two JI indicators in turn. In a second step, the robustness of these results to outliers is checked because the shorter time period in which data are available for Eastern European and CIS countries may lead to specific problems. In a third step, the JI indices are differentiated into their single components. Fourth, the additional variables are included in the regression. We present equations in which they are included in turn and all together. Several further variations of these regressions are not reported here which were also performed in order to check robustness. Finally, the robustness of the results to the construction of the *de facto* JI variable is tested. As mentioned above, those countries were included in the regression analysis that reported at least three components of the *de facto* index. Of course, it is an arbitrary decision how many questions one wants to have replied to. Since particularly the ranking of those countries with only three components appears to be surprising, e.g. Armenia, Kuwait, but also the Netherlands, regressions are reported for countries that answered four of the questions underlying the *de facto* JI index. The cross section analysis is performed by the simple OLS technique while inference is based on t-statistics computed on the basis of White heteroscedasticity consistent standard errors.

6 Estimation Results

The estimation results of the baseline specification are presented in *Table 2*. It is obvious that the three basic economic variables explain average real economic growth per capita only modestly. This is not improved if the *de iure* JI indicator is introduced in the model. The adjusted R^2 increases from 12 to 15 percent. On the other hand, the explanatory variables have

the expected signs and have some explanatory power. Initial real GDP per capita has a negative impact on economic growth that is significant on the 1 percent significance level. Thus, a catch up-effect can be observed in the cross-country sample used here as well. The real investment share has the expected positive impact on economic growth and is significant on the 5 percent level. While the secondary school attainment rate has the expected positive impact it does not reach any conventional significance level. Given the inclusion of Eastern European and CIS countries to a cross-country sample and the potential problems in the reliability of their data from the eighties, the results for schooling should not be too disturbing.

Table 2: OLS-Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, Baseline Specifications

<i>Variables</i>	(1)	(2)	(3)	(4)
<i>De iure</i> Judicial Independence	–	3.567 (1.22)	–	2.194 (0.70)
<i>De facto</i> Judicial Independence	–	–	4.608* (2.23)	4.509* (2.22)
Real GDP per capita in 1980 (in \$ 1'000)	-0.163** (2.69)	-0.183** (2.56)	-0.265** (2.80)	-0.269** (2.76)
Secondary School Attainment Rate in 1980 (in %)	0.047 (1.20)	0.050 (1.27)	0.063 (1.35)	0.065 (1.36)
Real Gross Domestic Investment (in % of GDP), Average in 1980-1998	0.119* (2.06)	0.115* (2.00)	0.120* (2.41)	0.116* (2.21)
Constant	-0.711	-2.918	-2.936	-4.325
\bar{R}^2	0.120	0.146	0.283	0.282
SER	2.658	2.618	2.451	2.453
J. -B.	207.089**	134.128**	102.883**	69.457**
Observations	65	65	56	56

The numbers in parentheses are the absolute values of the estimated t-statistics, based on the White heteroscedasticity-consistent standard errors. ‘***’, ‘*’ or ‘(*)’ show that the estimated parameter is significantly different from zero on the 1, 5, or 10 percent level, respectively. SER is the standard error of the regression, and J. -B. the value of the Jarque-Bera-test on normality of the residuals.

Adding the *de iure* JI indicator to the baseline regression does not alter the estimation results. *De iure* JI has the expected positive impact on average real GDP growth per capita but it is not significantly different from zero. Introducing *de facto* JI instead of *de iure* JI noticeably changes the estimation results however. It nearly doubles the explanatory power of the empirical model measured in the adjusted R^2 . Moreover, and as expected, *de facto* JI has a positive impact on real economic growth per capita and is significantly different from zero on the 5 percent significance level. This result does not change if both indicators of JI are introduced in one equation. *De facto* JI has a significantly positive impact on economic growth while the

positive impact of *de iure* JI is not significant. A basic problem in all equations presented in *Table 2* is the fact that the hypothesis of a normal distribution of the residuals of each equation can be rejected on the 0.1 percent significance level. These test statistics indicate that outliers may be hiding in the data set that might drive the results.

Table 3: OLS-Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, Robustness to Outliers

<i>Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>De iure</i> Judicial Independence	–	0.730 (0.41)	–	–	-0.894 (0.50)	-0.936 (0.51)
<i>De facto</i> Judicial Independence	–	–	2.840(*) (1.98)	3.241* (2.15)	2.853(*) (1.97)	3.252* (2.14)
Real GDP per capita in 1980 (in \$ 1'000)	-0.166** (3.41)	-0.170** (3.34)	-0.197** (3.42)	-0.188** (3.07)	-0.194** (3.27)	-0.184** (2.93)
Secondary School Attainment Rate in 1980 (in %)	0.044(*) (1.78)	0.044(*) (1.79)	0.032 (1.26)	0.018 (0.68)	0.030 (1.12)	0.016 (0.58)
Real Gross Domestic Investment (in % of GDP), Average in 1980-1998	0.154** (3.69)	0.152** (3.60)	0.162** (4.28)	0.172** (4.36)	0.165** (4.40)	0.175** (4.47)
Dummy for Georgia	14.977** (13.55)	14.734** (10.82)	13.850** (10.19)	13.413** (11.00)	14.142** (9.39)	13.722** (9.81)
Dummy for Eastern European and CIS Countries	-1.816* (2.09)	-1.803* (2.09)	-1.035 (1.13)	–	-1.028 (1.09)	–
Constant	-1.013	-1.459	-2.281	-2.521	-1.708	-1.920
\bar{R}^2	0.532	0.526	0.616	0.610	0.610	0.604
SER	1.938	1.952	1.795	1.809	1.809	1.822
J. -B.	3.587	3.966	0.095	0.608	0.057	0.453
Observations	65	65	56	56	56	56

For notes see *Table 2*.

An analysis of the residuals reveals that Georgia and a few other transition countries are outliers to any statistical criteria. In the case of Georgia, the country for which only a short term growth rate is used, it appears reasonable to introduce a dummy variable taking on the value of one for Georgia and zero otherwise. In addition, a dummy variable is introduced that takes on a value of one if the country is from Eastern Europe or the CIS and zero otherwise. Including both dummy variables, the estimation results in *Table 3* indicate that the hypothesis of normality of the residuals cannot be rejected any more according to the Jarque Bera test statistics. In each equation in *Table 3*, this procedure of controlling for outliers improves the esti-

mation results. Real GDP growth per capita can be explained to about 50 to 60 percent. Aside the dummy variables that capture the impact of outliers and are highly significant, the three basic economic variables keep their impacts, have the expected signs and are significant at least at the 10 percent significance level.

Including the indicator of *de iure* JI does not change these results qualitatively. As in *Table 2*, *de iure* JI has the expected positive impact but does not reach any conventional significance level. The impact of *de facto* JI is not fully robust to outliers. The coefficient of this indicator is strongly reduced and is significant at the 10 percent level only. However, *column (3)* in *Table 3* also indicates that the dummy variable for Eastern European and CIS countries is not significantly different from zero. Performing a Likelihood ratio test on redundancy of this dummy variable reveals that the hypothesis that this variable is redundant cannot be rejected (LR-statistic = 1.988). Excluding the dummy for these transition countries, *column (4)* reveals that the dummy for Georgia is already sufficient to successfully control for outliers. The Jarque-Bera statistic indicates that the null hypothesis of normality of the residuals cannot be rejected at any conventional significance level. Again, the results do not change if both indicators of JI are introduced in one equation. The dummy variable for Georgia is the only notable outlier and has to be controlled for. *De facto* JI is significantly increasing real GDP growth per capita. The impact of *de iure* JI is neither significant nor is it robust to outliers. Introducing the dummy variables in addition to *de facto* JI and *de iure* JI, the sign of the indicator of *de iure* JI reverses, although it is far from reaching significance. From this basic robustness analysis, it can thus be concluded that *de facto* JI has a relatively robust and significant positive impact on GDP growth while the growth impact of *de iure* JI is zero.

6.1 Analyzing Single Indicators

From the previous results, a natural question emerges: What is driving the differing results with respect to *de iure* and *de facto* JI? The answer to that question is not easily accomplished because the answers to the single questions underlying both indices are not complete for each question. In order to circumvent this problem a method is used that can be found quite often in survey studies: The missing values are set to the mean of each variable. Although this might appear to be a questionable method, it provides insights as to whether there are specific components of JI that exert particular impacts on economic growth. This procedure is used to analyze the impact of single indicators and the results are presented in *Table 4* without and with the dummy variable for Georgia for each set of JI indicators.

It is most interesting to note first that without controlling for the outlier of Georgia, the equation analyzing *de iure* JI is not well specified. Of the basic economic variables, only initial real GDP per capita has a marginally significant impact. According to the F-statistic on the null hypothesis that the coefficients of all variables are jointly not significantly different from

Table 4: OLS-Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, 65 Countries, Single Indicators

<i>Variables</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
Competences of Highest Court Enumerated	-1.060 (0.14)	-1.858 (0.27)	–	–
Procedures Specified	3.207 (0.35)	11.227* (2.20)	–	–
Accessibility Specified	8.466 (1.52)	5.715 (1.38)	–	–
Time Length Specified	5.725 (0.45)	7.060 (0.54)	–	–
Number of Judges Specified	2.416 (0.16)	-6.341 (0.57)	–	–
Supermajority Requirement	1.880 (1.01)	1.697 (1.01)	–	–
Agreement Requirement of Branches of Government	-1.243 (0.60)	-0.922 (0.53)	–	–
Majorities at Different Points in Time	1.281 (0.28)	1.622 (0.41)	–	–
Election Facilities of the Members of the Highest Court	0.361 (0.37)	0.041 (0.05)	–	–
Term of Office	-3.070(*) (1.75)	-2.280 (1.52)	–	–
Parliaments Election Period	1.050(*) (1.74)	1.034(*) (1.77)	–	–
Reelection Possibility of Judges	2.184 (1.59)	1.223 (1.19)	–	–
Removal of Judges from Office	-0.052 (0.06)	-0.113 (0.14)	–	–
Measures against Income Reductions of Judges	0.549 (0.62)	-0.020 (0.03)	–	–
Adequate Payment of Judges	0.858 (0.53)	-0.292 (0.26)	–	–
Accessibility to Highest Court	-1.999 (1.41)	-0.958 (0.86)	–	–
Rule for Allocation of Cases	-1.147 (1.47)	-0.921 (1.47)	–	–
Discretion for Allocation of Cases	-2.618* (2.02)	-1.707(*) (1.83)	–	–
Preview of the Power of Constitutional Review	-0.412 (0.37)	-0.344 (0.33)	–	–

Table 4 (cont.): OLS-Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, 65 Countries, Single Indicators

<i>Variables</i>	(1)	(2)	(3)	(4)
Publication Requirements	1.850 (1.19)	0.624 (0.55)	–	–
Effective Average Term Length of Judges	–	–	0.161 (0.09)	-0.805 (0.67)
Deviation from ‘Normal’ Average Term Length	–	–	1.907(*) (1.78)	1.262 (1.58)
Effective Removals before End of Term	–	–	1.252 (1.41)	0.560 (0.86)
Changes of the Number of Judges	–	–	1.059 (1.29)	1.266 (1.39)
Real Income Improvements	–	–	2.016** (2.89)	1.669* (2.44)
Real Constancy of the Budget of the Highest Court	–	–	-0.263 (0.45)	-0.383 (0.67)
Number of Changes of Relevant Articles of the Constitution	–	–	0.480 (0.26)	1.675 (1.18)
Implementation Deficit of Court’s Rulings	–	–	0.317 (0.30)	0.751 (0.77)
Real GDP per capita in 1980 (in \$ 1'000)	-0.156 (1.52)	-0.071 (0.94)	-0.231** (3.12)	-0.184** (3.20)
Secondary School Attainment Rate in 1980 (in %)	0.053 (1.41)	0.022 (0.80)	0.053 (1.29)	0.016 (0.67)
Real Gross Domestic Investment (in % of GDP), Average in 1980-1998	0.092(*) (1.84)	0.135* (2.70)	0.120(*) (1.81)	0.186** (4.98)
Dummy for Georgia	–	13.419** (8.42)	–	13.723** (11.61)
Constant	-4.978	-4.672	-4.817	-4.902
\bar{R}^2	0.144	0.493	0.224	0.564
SER	2.621	2.018	2.496	1.872
J. -B.	41.776**	0.016	140.789**	0.031
F-statistic	0.955	1.176	2.918**	2.327*

The numbers in parentheses are the absolute values of the estimated t-statistics, based on the White heteroscedasticity-consistent standard errors. ‘***’, ‘*’ or ‘(*)’ show that the estimated parameter is significantly different from zero on the 1, 5, or 10 percent level, respectively. SER is the standard error of the regression, and J. -B. the value of the Jarque-Bera-test on normality of the residuals. The F-statistic is the value of the Wald-Test on the hypothesis that all indicators of judicial independence in one equation are jointly equal to zero.

zero (not shown in *Table 4*), these variables cannot explain GDP growth (F-statistic = 1.470). This is reflected as well by the Wald test on the joint significance of all indicators of *de iure*

JI (the F-statistic that is reported in the table): The hypothesis that they have no impact on economic growth cannot be rejected at any conventional significance level. What this exercise is showing, however, is the diverse picture of influences of all these variables of *de iure* JI. While most of them have no significant impact, the sign of their impacts differs from variable to variable leaving no clear-cut impression as to how these results can be interpreted. Summing the indicators up and consolidating them in a single index reflects the diverging impacts as well. *De iure* JI has no impact on GDP growth.

This is different in the case of *de facto* JI as *columns (3) and (4) of Table 4* indicate. The Wald test on joint significance of the eight components of *de facto* JI reveals that the hypothesis that these variables jointly have no impact on real GDP per capita growth can be rejected on the 5 percent significance level. This result is merely reflecting the result for the composite index of *de facto* JI, but it clarifies as well that the single components of *de facto* JI exert a more homogeneous positive impact on GDP growth. Moreover, it appears to be statistically most important that judges of the highest courts keep their real income at least constant in real terms. The respective variable is by far the most important variable in statistical terms. But even for the remaining variables, the hypothesis that they are not influencing GDP growth can be rejected on the 10 percent significance level (F-statistic = 1.900).⁶

These results underline a conjecture mentioned above: Judicial independence in some countries may solely be written down in legal documents without actually keeping up judicial independence *de facto*. This conjecture is indirectly corroborated by these results. Judicial independence is important for economic growth, but it cannot be simply obtained by changes in law. It must be backed up by actually living judicial independence.

6.2 Robustness to Additional Economic Variables

As usual, the impact of the *de facto* JI indicator may be reflecting third variables that are not yet included in the estimation equation. Put differently, an omitted variable bias might influence the estimation results. In order to check the robustness of the results to the inclusion of other variables, average government consumption in percent of GDP, openness, average population growth, average inflation and several indicators of economic freedom that include some assessment of judicial independence are included in the equation that is robust to the impact of outliers. They are first introduced in turn and then in each possible permutation. Finally, they are included together in one equation.

6. It might be argued that there is a reversed causation between economic growth and real income improvements of judges. The higher economic growth, the better the income possibilities. It has to be noted however that salaries of judges are nominally fixed in long-term contracts for most countries such that real income improvements much more strongly depend on inflation performances and to the indexation of these salaries to inflation.

The results are presented in *Table 5*. None of these variables has a single significant impact on GDP growth. Only the indicators of economic freedom are jointly significant as the Wald test reported in *columns (5) and (6) of Table 5* indicates. Introducing them together (in a reduced sample without East European and CIS countries), government consumption, population growth and inflation have negative impacts on real GDP growth per capita at least on the 10 percent significance level, while the basic economic variables remain robust.

Table 5: Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, Robustness to Inclusion of Other Variables I

<i>Variables</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>	<i>(6)</i>
<i>De iure</i> Judicial Independence	-0.965 (0.52)	-1.186 (0.65)	-0.809 (0.43)	-0.928 (0.51)	-2.785(*) (1.95)	-1.422 (0.98)
<i>De facto</i> Judicial Independence	3.111* (2.08)	3.059(*) (1.90)	3.315* (2.14)	3.379* (2.32)	2.893 (1.57)	3.228* (2.13)
Real GDP per capita in 1980 (in \$ 1'000)	-0.194** (3.06)	-0.193** (3.13)	-0.203* (2.66)	-0.196** (3.43)	-0.226** (3.45)	-0.363** (3.74)
Secondary School Attainment Rate in 1980 (in %)	0.020 (0.73)	0.019 (0.66)	0.010 (0.39)	0.032 (1.15)	0.026 (1.08)	0.032 (1.53)
Real Investment (in % of GDP), Average in 1980-1998	0.168** (4.24)	0.190** (4.69)	0.178** (4.59)	0.168** (5.05)	0.148** (4.36)	0.177** (5.03)
Average Government Consumption (in % of GDP)	-0.030 (0.82)	–	–	–	–	-0.074(*) (1.82)
Openness (in % of GDP)	–	-0.005 (0.75)	–	–	–	-0.006 (0.89)
Average Population Growth, 1980-1998	–	–	-0.215 (0.64)	–	–	-0.865* (2.37)
Average Inflation Compared to U.S.	–	–	–	-0.023 (1.33)	–	-0.071* (2.19)
F-statistic of Other Indicators of Economic Freedom	–	–	–	–	3.376*	4.117**
\bar{R}^2	0.601	0.602	0.601	0.612	0.463	0.620
SER	1.830	1.826	1.830	1.804	1.421	1.196
J. -B.	0.389	0.709	1.225	0.278	2.927	0.090
Observations	56	56	56	56	42	42

For notes see *Table 4*. Results for the single indicators of economic freedom, the dummy for Georgia and constant are not reported.

More importantly, however, the positive impact of *de facto* JI on economic growth per capita remains relatively robust. Its significance drops slightly beyond the 10 percent significance level in the case other economic freedom indicators are additionally introduced.⁷ The impact of the economic freedom indicators is, however, not absolutely robust to the inclusion of additional economic variables such that the positive impact of *de facto* JI on economic growth per capita is restored.

In addition to economic freedom in general, judicial independence may be the result of the legal and political environment in general. For example, judicial independence may depend upon the legal tradition of a country such that judicial independence is less pronounced, say, in countries with a Socialist or French legal origin. The effect of judicial independence measured in the regressions above may then only reflect the impact of another variable not included in the regressions. In order to capture the impact of the legal origin of a country, the respective variables reported by La Porta et al. (1999) are included in the regressions. These are five dummy variables taking on the value of one in the case of English, French, Socialist, German or Scandinavian legal origin, respectively. Because these dummies together are perfectly collinear, Scandinavian legal origin is used as the reference group. Like judicial independence might be the result of the legal origin, it may also be shaped by political stability. It is easy to grant judges *de facto* judicial independence in quiet times, but much more difficult in cases of political turmoil. Since political turmoil is usually leading to economic crises (and vice versa), the positive impact of JI on economic growth would simply reflect the impact of political stability, and an omitted variable bias would result. Political stability is controlled for by a variable on the lack of political instability provided by the World Bank (2001).

Checking the robustness of the effects of JI on economic growth on these two variables, we start with the equation reported in *column (6)* of *Table 5* excluding the economic freedom indicators and add both (groups of) variables in turn, include them together and finally add the economic freedom indicators again. The results are reported in *Table 6*. The consideration of these additional variables does not change the results neither of the JI indicators nor of the economic controls. The legal origin dummies together are not significantly different from zero according to the Wald-tests reported in *Table 6*. The lack of political instability is not significantly different from zero as well.

7. It looks strange to include the economic freedom indicators in addition to the indices of *de iure* and *de facto* judicial independence if the former already includes some aspects of judicial independence. However, it has to be noted that the judicial independence indices capture this particular effect of components included in the economic freedom indicator properly by using multivariate regression analysis. The measured effect of the economic freedom indicators is thus only that of the other components excluding judicial independence. An alternative method would be the explicit exclusion of that specific component from the economic freedom indicators. Both methods are equivalent.

Table 6: Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, Robustness to the Inclusion of Other Variables II

<i>Variables</i>	(1)	(2)	(3)	(4)
<i>De iure</i> Judicial Independence	-1.027 (0.51)	-0.073 (0.04)	-0.430 (0.21)	-2.167 (1.67)
<i>De facto</i> Judicial Independence	3.343* (2.02)	3.119(*) (1.97)	3.123(*) (1.81)	3.717* (2.38)
Real GDP per capita in 1980 (in \$ 1'000)	-0.299** (3.77)	-0.314** (4.49)	-0.347** (4.62)	-0.410** (3.82)
Secondary School Attainment Rate in 1980 (in %)	0.034 (1.06)	0.037 (1.37)	0.039 (1.32)	0.033 (1.49)
Real Investment (in % of GDP), Average in 1980-1998	0.173** (4.27)	0.162** (4.11)	0.167** (3.76)	0.189** (4.31)
Average Government Con- sumption (in % of GDP)	-0.020 (0.51)	-0.021 (0.67)	-0.020 (0.52)	-0.068 (1.23)
Openness (in % of GDP)	-0.003 (0.47)	-0.006 (0.95)	-0.006 (1.00)	-0.010 (1.35)
Average Population Growth, 1980-1998	-0.883* (2.29)	-0.400 (0.86)	-0.720 (1.60)	-1.354* (2.31)
Average Inflation Compared to U.S.	-0.031 (1.33)	-0.034 (1.50)	-0.028 (1.10)	-0.076* (2.39)
English Legal Origin	0.150 (0.20)	–	0.338 (0.45)	0.526 (0.59)
Socialist Legal Origin	-1.553 (1.42)	–	-1.278 (1.24)	-2.376 (1.39)
French Legal Origin	-0.602 (0.99)	–	-0.325 (0.55)	-0.463 (0.84)
German Legal Origin	-0.872 (0.97)	–	-0.825 (0.90)	-0.975 (1.44)
Lack of Political Instability	–	0.798 (1.01)	0.775 (0.97)	-0.221 (0.36)
F-statistic of Legal Origin Dummies	1.349	–	1.225	1.029
F-statistic of Other Indicators of Economic Freedom	–	–	–	2.863*
\bar{R}^2	0.607	0.626	0.612	0.595
SER	1.815	1.785	1.818	1.234
J. -B.	1.836	1.449	0.566	0.108
Observations	56	56	56	42

For notes see *Table 4*. Results for the single indicators of economic freedom, the dummy for Georgia and constant are not reported.

De facto JI keeps its significantly positive impact however (at least at the 10 percent significance level) while *de iure* JI is not significantly different from zero on any conventional significance level and keeps the unexpected negative sign. In addition to the political and legal variables reported, robustness tests were performed using indicators of ethnic/linguistic fractionalization of a country, of the number of coups and of the age of the constitutions. The *de facto* indicator of judicial independence remained robust to any of these additional specifications not reported here.

6.3 Robustness to Construction of the *de facto* Judicial Independence

Given these rather robust results, the reliability of the constructed JI indicators may raise the only remaining doubts on the validity of the estimation results. A final test of robustness is thus concerned with a check as to how robust the impact of judicial independence, in particular the *de facto* JI indicator, is to changes in the definition of that variable. As noted above, countries were only included in the sample of the *de facto* indicator if they replied to at least three of the eight components comprising *de facto* JI. This decision is of course arbitrary. We could as well have demanded each other number between 1 and 8. We therefore change our reservation number of replies to that question as a robustness test. A glance at *Appendix 3* reveals that the countries providing replies to only 3 components are already the strangest countries in the ranking. For example, the two highest ranking countries Armenia and Kuwait do not have a strong record for judicial independence, while the Netherlands and the Czech Republic may be ranked too low according to usual prejudice.

Table 7 therefore contains the entries of six estimated equations by using a *de facto* JI indicator based on at least 4 components of that index. The number of observations is then reduced to only 50 (39). We first reproduce the baseline regressions controlling for outliers, then *column (6)* of *Table 5* and finally three equations of *Table 6* controlling for several additional political and legal control variables. It is not necessary to describe these results in more detail. Of course, the point estimates of the single variables changes. This is however no surprise given the changes in sample size and in the indicator for *de facto* JI. The latter impact turns out to be even stronger in statistical and economic terms: Significance levels are slightly higher and the size of the coefficient is higher as well. The inclusion of countries incompletely answering to the survey in the *de facto* indicator obviously weakens the results. All in all, this is strong evidence for a positive impact of judicial independence on economic growth.

Table 7: Regressions of GDP Growth per Capita from 1980 to 1998 on Judicial Independence and Controls, Robustness to Construction of de facto Judicial Independence

<i>Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>De iure</i> Judicial Independence	-1.477 (0.79)	-1.422 (0.75)	-1.949 (1.38)	-1.947 (0.91)	-1.449 (0.67)	-1.894 (1.31)
<i>De facto</i> Judicial Independence	4.553* (2.59)	4.912** (2.76)	3.145(*) (1.99)	4.957* (2.42)	4.609* (2.18)	3.656* (2.29)
Real GDP per capita in 1980 (in \$ 1'000)	-0.245** (3.57)	-0.242** (3.60)	-0.333** (3.13)	-0.325** (3.82)	-0.370** (4.41)	-0.369** (3.21)
Secondary School Attainment Rate	0.031 (1.07)	0.023 (0.84)	0.035 (1.48)	0.030 (0.85)	0.036 (1.06)	0.025 (0.87)
Real Investment (in % of GDP)	0.154** (5.06)	0.160** (5.26)	0.169** (4.70)	0.159** (3.98)	0.151** (3.47)	0.169** (3.52)
Gov. Consumption (in % of GDP)	–	–	-0.085* (2.27)	-0.057 (1.27)	-0.056 (1.24)	-0.090(*) (1.75)
Openness (in % of GDP)	–	–	-0.005 (0.69)	-0.003 (0.44)	-0.006 (0.87)	-0.009 (1.01)
Average Population Growth, 1980-1998	–	–	-0.734* (2.08)	-0.603 (1.58)	-0.492 (1.11)	-0.985 (1.58)
Average Inflation Compared to U.S.	–	–	-0.086** (2.93)	-0.017 (0.57)	-0.018 (0.58)	-0.093** (3.00)
English Legal Origin	–	–	–	-0.260 (0.31)	-0.011 (0.01)	0.701 (0.70)
Socialist Legal Origin	–	–	–	-1.497 (1.17)	-1.277 (1.00)	-1.688 (0.94)
French Legal Origin	–	–	–	-1.232(*) (1.74)	-0.909 (1.34)	-0.610 (0.83)
German Legal Origin	–	–	–	-1.615 (1.66)	-1.518 (1.51)	-0.636 (0.80)
Lack of Political Instability	–	–	–	–	0.726 (0.94)	0.153 (0.24)
Dummy for Georgia	13.077** (7.71)	12.662** (9.11)	–	12.377** (6.32)	12.783** (6.10)	–
Dummy for CEE and CIS Countries	-0.724 (0.64)	–	–	–	–	–
F: Legal Origin	–	–	–	1.904	1.767	0.750
F: Econ. Freedom	–	–	4.938**	–	–	3.861*
\overline{R}^2	0.641	0.644	0.637	0.628	0.630	0.604
SER	1.791	1.785	1.197	1.825	1.839	1.250
J. -B.	0.231	0.488	1.524	0.003	0.017	0.606
Observations	50	50	39	50	50	39

For notes see Table 4. Results for constant are not reported.

7 Conclusions and Open Questions

Using two new indicators of judicial independence, a *de iure* and a *de facto* indicator that are obtained from a survey among experts in the different countries, we have analyzed the impact of judicial independence on economic growth. While *de iure* judicial independence does not have an impact on economic growth, *de facto* JI positively influences real GDP growth per capita in a sample of 56 countries. This distinction between *de iure* and *de facto* JI indicates that it does not suffice to write JI in legal documents. It is necessary to shape JI by additional informal procedures that may be accompanied and enforced by informal social sanctions. Issues like the average term length of judges, its deviation from the term lengths to be expected based on legal documents, effective removals of judges before the end of their terms as well as a secure income for the judges appear to be more important for economic growth than *de iure* independence. The impact of *de facto* JI on economic growth is robust to outliers, to the inclusion of several additional economic, legal and political control variables and to the construction of the index. It can thus be concluded that judicial independence matters for economic growth.

Some caveats for the interpretation of these results have to be mentioned. It has to be emphasized that this is the first study that is undertaken by using these new indicators of JI. First, the database is not yet completed. From time to time, responses from surveyed ‘latecomers’ drop in. These additional observations could be included in the analysis in order to obtain full confidence of the results presented in this paper. Second, the economic database used, i.e. the update of the Summers and Heston data set to PWT 6.0, may still be subject to revision although it was authorized in the end of 2001 while this study was revised such that corrections could be considered. Nevertheless, the results presented in this paper are already promising.

In future studies, it might be interesting to test for the independence not of constitutional courts, but of commercial courts. It could be the case that private investors are primarily interested in how commercial and not constitutional disputes are resolved. Further, one might want to fine-tune some of the variables of the *de facto* indicator: right now, any deviation between expected and effective term-length will lead to a reduction of a country’s score. It, however, makes sense to distinguish between politically motivated and other changes. A divergence might simply be due to a judge dying before the end of his term. This distinction could also be made with regard to some other variables.

In addition, there seem to be some similarities between JI and central bank independence (CBI) that deserve further research. Over the last couple of years, a literature analyzing the relationship between CBI and monetary stability has emerged (Berger, de Haan and Eijffinger 2001 is a survey). In the CBI-literature, the degree of independence has been taken as an exogenous variable. The explanation of the different degrees of the *de facto*-independence remains a clear deficit of the theory (Berger 1997). But it almost suggests itself to hypothesize

that an independent judiciary is a precondition for an independent central bank – and thus to endogenize CBI. This hypothesis could, of course, be extended to other independent government agencies such as antitrust agencies, statistical offices etc. It could, of course, also be the case that there is a high correlation between the two but that the (*de facto*) CBI is not caused by the (*de facto*) JI because a third variable helps to explain both. This third variable could consist of cultural elements (see, e.g., Hayo 1998 or Voigt 1999).

Bibliography

- Berger, H. (1997); Die aktuelle Debatte um Zentralbankunabhängigkeit: Theoretische und empirische Fragen, *Zeitschrift für Unternehmensgeschichte* 41:89-111.
- Berger, H., J. de Haan and S. Eijffinger (2001); Central Bank Independence: An Update of Theory and Evidence, *Journal of Economic Surveys* 15:3-40.
- Brunetti, A., G. Kisunko and B. Weder (1998); Credibility of Rules and Economic Growth: Evidence from a Worldwide Survey of the Private Sector, *The World Bank Economic Review* 12:353-384.
- Gwartney, J., R. Lawson and W. Block (1996); *Economic Freedom of the World: 1975 - 1995*. Vancouver et al.: The Fraser Institute et al.
- Gwartney, J. R. Lawson and D. Samida (2000); *Economic Freedom of the World: 2000 Annual Report*. Vancouver et al.: The Fraser Institute et al..
- Haan, J. de and J.E. Sturm (2000); On the Relationship between Economic Freedom and Economic Growth, *European Journal of Political Economy* 16:215-241.
- Hayo, B. (1998); Inflation Culture, Central Bank Independence and Price Stability, *European Journal of Political Economy*, 14:241-263.
- Heston, A., Summers, R. and B. Aten (2001), *Penn World Table, Version 6.0*, Center for International Comparisons at the University of Pennsylvania (CICUP), December 2001.
- Knack, St. and Ph. Keefer (1995); Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures, *Economics and Politics* 7:207-227.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1999); The Quality of Government, *Journal of Law, Economics and Organization* 15: 222-279.
- Smithey, Sh. and J. Ishiyama (2000); Judicious Choices: Designing Courts in Post-Communist Politics, *Communist and Post-Communist Studies* 33:163-182.
- Voigt, S. (1999); Implicit Constitutional Change - Changing the Meaning of the Constitution Without Changing the Text of the Document, *European Journal of Law and Economics* 7:197-224.
- Voigt, S. (2001); Making Promises Credible – Introducing Two New Indicators Measuring Judicial Independence, mimeo, Ruhr University of Bochum 2001.
- Weingast, B.R. (1993), Constitutions as Governance Structures: The Political Foundations of Secure Markets, *Journal of Institutional and Theoretical Economics (JITE)* 149: 286-311.
- World Bank (2001), Aggregate Governance Indicators, Washington, http://www.worldbank.org/research/growth/corrupt_data.htm.

Appendix 1: Text of the questionnaire combined with coding used

**Making Promises Credible –
Independent Courts as a Proxy for the Rule of Law
QUESTIONNAIRE**

Please return to:

Prof. Dr. Stefan Voigt
Economic Policy, Economics
Ruhr-University Bochum
D-44780 Bochum
Germany

Dear Reader,

This research project is an attempt to make judicial independence measurable and thus comparable between countries. I would be grateful if you could help me with your knowledge concerning the country on which you are an expert. I would appreciate if you could (a) answer the following questions, and (b) could indicate good sources to get the desired information (primary as well as secondary).

If you are interested, I would be pleased to keep you informed on the progress concerning the indicator. In that case, please provide me with your address. Of course, the easiest way to return the questionnaire is by e-mail.

Thank you very much for your help. Yours sincerely

Stefan Voigt

Country for which information is provided:

A *de iure* measure for court independence

- (1) Is the highest court mentioned in the constitution? (1/2) YES () NO
- a. Are its competencies enumerated in the constitution? (1/8) YES () NO
- b. Are its procedures specified in the constitution? (1/8) YES () NO
- c. Is access to the highest court specified in the constitution? (1/8) YES () NO
- d. Are the arrangements concerning the members of the highest court enumerated in the constitution?
- aa. Is the term length specified in the constitution? (1/16) YES () NO
- bb. Is the number of judges specified in the constitution? (1/16) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (2) How difficult is it to amend the constitution?
- a. Is a majority necessary that is above that necessary for changing ordinary legislation? (1) YES () NO
- b. How many branches of government have to agree? (1/4) 1; (1/2) 2; (3/4) 3
- c. Are majority decisions necessary at different points in time? (1/4) YES () NO

* Note on coding concerning this question: The sum of b and c provided that a is answered in the affirmative

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (3) How are the members of the highest court elected/nominated? (PLEASE TICK THE APPROPRIATE LETTER)
- a. Judges are nominated and elected by one or more members of the executive
- b. Judges are nominated by one or more members of the executive and are elected by parliament (or a committee thereof).
- c. Judges are nominated by one or more members of the executive and are elected by the judiciary.
- d. Judges are nominated and elected by parliament (or a committee thereof).

- e. Judges are nominated by parliament (or a committee thereof) and are elected by one or more members of the executive.
- f. Judges are nominated by parliament (or a committee thereof) and are elected by the judiciary.
- g. Judges are nominated and elected by the judiciary.
- h. Judges are nominated by the judiciary and are elected by one or more members of the executive.
- i. Judges are nominated by the judiciary and are elected by parliament (or a committee thereof).
- j. Judges are nominated by the judiciary, the legislature, or the executive and are elected by actors not representing any government branch (academics, the public at large

		Competence to elect/appoint members of highest court		
		Executive	Legislature	Judiciary
Competence to nominate members of highest court	Executive	0	1/3	2/3
	Legislature	1/3	0	2/3
	Judiciary	2/3	2/3	1

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(4) What is the legal term length of the judges on the highest court?

NUMBER OF YEARS _____

In comparison, parliament's election period in number of years _____

Concerning legal term length, emphasis in the institutional arrangement is usually either on a specification in number of years or on a fixed retirement age. We thus need two coding scales. Here they are:

<u>Term of office(too)</u>	<u>coding</u>
≥ 12 years	1,0
$10 \leq too < 12$	0,8
$8 \leq too < 10$	0,6
$6 \leq too < 8$	0,4
$4 \leq too < 6$	0,2

4 > too 0,0

Often, judges are appointed rather later in their careers. Early and mandatory retirement is hypothesized to constrain ji because judges could be less daring during their first couple of years in office. We used the following coding:

<u>Too</u>	<u>coding</u>
for life	1,0
Mandatory retirement ($mr \geq 75$ years)	1,0
$65 \leq mr < 75$	0,8
$65 > mr$	0,6.

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(5) Can judges be reelected? (0) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(6) How can judges be removed from office? (PLEASE TICK THE APPROPRIATE LETTER)

- | | |
|--|----|
| a. only by judicial procedure; | 1 |
| b. by decision of one or more members of the executive; | 0 |
| c. by decision of parliament (or a committee thereof); | 0 |
| d. by joint decision of one or more members of the executive and of parliament (or a committee thereof). | ½. |

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(7) Is there a measure against income reduction of judges? Is there a mechanism securing adjustment in real terms? (1) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(8) Are the judges paid adequately?

- a. Are they paid more than university professors? (1/3) YES () NO
- b. Are they paid more than an average private lawyer? (1/3) YES () NO
- c. Are they paid as well as the minister of justice? (1/3) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (9) Who has the possibility to access the highest court?
- a. Individuals in any case relevant to the constitution and with which they are personally concerned. 1
 - b. Individuals, but only in a subset of cases relevant to the constitution (such as human rights) ½.
 - c. Only other government branches. 0

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (10) Is there a general rule allocating the responsibility concerning incoming cases to specific judges? (1) YES () NO
(or does the chief justice have discretion on the allocation of cases?) () YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (11) Does the constitution (or the law establishing the highest court) preview the power of constitutional review? (1) YES () NO
- Are there any limits to it**
(e.g., only before a law has been promulgated?) () YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

- (12) Does the highest court have to publish
- (a) the main reasons for a decision (1/3) YES () NO
 - (b) an extended proof? (1/3) YES () NO
- (12) Are dissenting opinions published regularly? (1/3) YES () NO

A de facto measure for court independence

(13) What has been the effective average term length of judges since the respective legal foundations have been passed? IN NUMBER OF YEARS _____

For coding, the number of years was multiplied by 0.05.

a. does it deviate from the average term length to be expected by the legal foundations? (0) YES () NO

b. How many judges have been removed from office before end of term? NUMBER _____

For coding, any positive number led to a zero-coding.

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(14) How many times has the number of judges been changed since 1960? NUMBER _____

The answers were coded using the following table:

<u>Number of changes</u>	<u>Coding</u>
0	1,0
1-2	0,8
3-4	0,6
5-6	0,4
7-8	0,2
more	0,0

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(15) Has the income of judges remained at least constant in real terms since 1960? (1) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(16) Has the budget of the highest court remained at least constant in real terms since 1960? (1) YES () NO

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(17) How often have the relevant articles of the Constitution (or the law on which the highest court is based) been changed since 1960?

NUMBER OF CHANGES _____

The answers were coded according to the key used for variable 14.

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

(18) In how many cases has one of the other government branches remained inactive when its action was necessary for a decision to become effective?

NUMBER OF CASES _____

The answers were again coded according to the key used for variable 14.

A GOOD SOURCE FOR MORE DETAILED INFORMATION IS _____

General comments (please feel free to make any comment):

Appendix 2: The *de iure* Index

In the following table, the *de iure* index is presented in the rank order that emerged as a result of the coding:

Rank	Country	Index Value	No. Of Var.				
1	Colombia	0,939	12	36	Israel	0,663	12
2	Phillipines	0,909	10	37	Hungary	0,651	11
3	Brazil	0,907	12	38	Venezuela	0,650	12
4	Georgia	0,893	12	39	Bahamas	0,646	12
5	Slovenia	0,869	12	40	Estonia	0,641	11
6	Singapore	0,851	12	41	France	0,634	11
7	Russia	0,845	11	42	Netherlands	0,631	12
8	Botswana	0,841	12	43	Armenia	0,629	12
9	Ecuador	0,835	12	44	India	0,629	12
10	Greece	0,833	10	45	Japan	0,622	12
11	Belgium	0,825	10	46	Jordan	0,615	8
12	Australia	0,817	11	47	Korea, South	0,607	12
13	Cyprus	0,817	12	48	Sweden	0,605	10
14	Mexico	0,804	12	49	Trinidad/ Tobago	0,596	10
15	Nepal	0,799	12	50	Taiwan	0,575	12
16	Mauritius	0,797	11	51	Kuwait	0,574	10
17	Italy	0,793	12	52	Croatia	0,570	11
18	Paraguay	0,781	8	53	Slovakia	0,569	12
19	Denmark	0,779	11	54	Spain	0,551	12
20	Chile	0,778	9	55	Romania	0,548	7
21	Pakistan	0,765	12	56	Kazakhstan	0,538	11
22	Czech Republic	0,761	12	57	Portugal	0,530	10
23	South Africa	0,761	11	58	Ivory Coast	0,507	11
24	Austria	0,733	11	59	Guatemala	0,499	11
25	Germany	0,729	12	60	Montenegro	0,465	11
25	Fiji Islands	0,729	11	61	Ghana	0,464	7
27	Kenya	0,709	12	62	Switzerland	0,459	12
28	Egypt	0,708	12	63	Azerbaijan	0,451	10
29	Poland	0,693	11	64	Lithuania	0,447	11
30	USA	0,685	12	65	Mozambique	0,441	12
31	Costa Rica	0,685	12	66	China	0,406	12
32	Namibia	0,684	12	67	Bulgaria	0,397	12
33	Canada	0,681	10	68	Vanuatu	0,377	10
34	Turkey	0,678	12	69	Malaysia	0,313	8
35	Argentina	0,665	12	70	Morocco	0,275	5
				71	Tanzania	0,265	12

N=71; mean=0,654; standard deviation=0,157.

Among them 16 countries from Central and Eastern Europe; mean_{CEE}=0,623; standard deviation-_{CEE}=0,151; in comparison EU (11 memberstates considered): mean: 0,695; standard deviation: 0,104.

Appendix 3: The *de facto* Index

Ranking and scores according to the *de facto* indicator:

Rank	Country	Index Value	No. Of Var.			
1	Armenia	1,000	3	32	Colombia	0,571 7
1	Kuwait	1,000	3	33	Jordan	0,560 5
3	Switzerland	0,943	7	34	Guatemala	0,550 7
4	Turkey	0,933	6	35	USA	0,546 6
5	Costa Rica	0,920	5	36	Pakistan	0,525 8
6	Austria	0,900	4	37	Mozambique	0,520 5
6	Japan	0,900	4	37	Nepal	0,520 5
9	South Africa	0,867	6	39	Greece	0,500 4
10	Taiwan	0,863	8	40	Brazil	0,494 8
11	Israel	0,860	5	41	Netherlands	0,467 3
12	Italy	0,858	6	42	Bahamas	0,450 4
13	Georgia	0,850	6	43	Fiji Islands	0,436 7
14	Australia	0,819	8	44	Lithuania	0,433 6
15	Denmark	0,813	6	45	Slovenia	0,431 8
16	Belgium	0,800	8	46	Singapore	0,421 7
16	Germany	0,800	6	47	Botswana	0,414 7
16	Hungary	0,800	8	48	Ecuador	0,400 8
19	France	0,780	5	48	Venezuela	0,400 4
20	Spain	0,750	8	50	Trinidad/ Tobago	0,388 4
21	Cyprus	0,743	7	51	China	0,370 5
22	Phillipines	0,731	8	52	Argentina	0,333 6
23	India	0,708	6	53	Vanuatu	0,320 5
24	Mexico	0,707	7	54	Slovakia	0,319 8
25	Portugal	0,706	8	55	Ghana	0,300 3
26	Estonia	0,700	8	56	Malaysia	0,270 5
26	Sweden	0,700	5	57	Egypt	0,240 5
28	Croatia	0,657	7	58	Kenya	0,175 6
29	Paraguay	0,600	3	59	Czech Republic	0,167 3
30	Korea, South	0,588	8	60	Bulgaria	0,133 6
31	Chile	0,575	4	60	Russia	0,133 6
				62	Montenegro	0,100 4

N=62; mean=0,591; standard deviation=0,242.

Among them 11 countries from Central and Eastern Europe; mean_{CEE}=0,477; standard deviation-_{CEE}=0,303; in comparison EU (11 memberstates considered): mean: 0,734; standard deviation: 0,131.