The constitution of economic growth: Testing the prosperity effects of a Madisonian model on a panel of countries 1980-2000

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2007

(27.II.2007 – preliminary version)

The constitution of economic growth
Testing the prosperity effects of a Madisonian model on a panel of countries 1980-2000[1]

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Abstract
Political scientists and economists increasingly agree that institutions may influence economic growth, but there is little general agreement on what institutions tend to produce what consequences. We apply public choice insights for a theoretical analysis that may be termed "Madisonian": Institutions that divide political power between multiple veto players and institutions that protect private property rights may be expected to have positive effects on economic growth. We analyze data from a panel of countries for the period 1980-2000 in order to study the relationships, including a series of "extreme bounds" analyses in order to test the robustness of the statistical results. We find that particularly the presence of secure private property has a significant, positive and robust effect on economic growth and that when outliers are excluded a configuration where political power is dispersed among more veto players has a similar effect.

1. Introduction

Growth matters. Between 1980 and 2000 the average annual economic growth in the countries of the world amounted to 1.2 pct. However, this figure in reality covers quite considerable differences between countries and over the years. The highest average annual

[1] The present joint work is an outgrowth of a number of separate works of ours (Kurrild-Klitgaard 2001; Kurrild-Klitgaard 2002; Kurrild-Klitgaard 2003; Kurrild-Klitgaard and Berggren 2004; Justesen 2004; Justesen 2006). We are grateful to a number of people who commented on these earlier works, including Niclas Berggren, Peter J. Boettke, Otto Brøns-Petersen, Lars Johannsen, Nils Karlson, Ida P. Kristensen, Martin Paldam, and Stefan Voigt.

growth rate 1981-2000 was China's with an impressive 6.17 pct. A number of countries could average annual growth rates of about or above 4 pct., including South Korea, Singapore, Ireland and Botswana. At the other end of the scale are countries like Sierra Leone, Nicaragua, Chad and Togo, who all had negative growth rates of 2 pct. or more.[2] In other words, while some countries have been successful with regard to generating high growth rates, others have failed to do so, and the consequences of achieving the one or the other are, as any good social scientist should know, quite considerable.

Traditionally questions of what determines economic growth have almost exclusively been investigated by economists (e.g. Barro 1997; Sala-i-Martin 1997). A frequent point of departure for economic growth analysis is the theory of convergence (Barro 1991; Barro 1997). This thesis suggests that, everything else being equal, countries which initially are poor will experience higher growth rates than countries that initially are wealthy. The explanation of this is, in Barro's words, that "Poor countries, with low ratios of capital to labor, have high marginal products of capital and thereby tend to grow at high rates" (Barro 1991: 407). The low starting points of poor countries should thus give these an advantage due to the relatively high marginal return on investments and capital, and over time this will result in a convergence in wealth levels between wealthy and poor countries. However, the empirical problem is that the convergence, in absolute terms, to a large extent has not materialized (Barro 1991; Barro 1997). Furthermore, the theory of convergence has in itself problems with regard to specification of the conditions under which economic convergence occurs.

However, just as growth matters, so do—at least according to an often cited truism—institutions (Ostrom 1986; Weaver and Rockman 1993b; Peters 1999). This is, of course, nothing new to economists who have long realized that the basic institutional arrangements of a

[2] The economic growth data derive from *Penn World Tables* (Heston, Summers and Aten 2002).

society may have important effects on its prosperity (cf., e.g., Smith [1776] 1981; North and Thomas 1973; North 1992). But when it comes to the possible importance of political-institutional factors for economic growth the interest has been more recent, and the debate has primarily focused on the relative merits of democracy versus autocracy (e.g., Przeworski and Limongi 1993; Przeworski et al. 2000; Olson 2000). At a theoretical level, some have argued that democratic institutions will limit economic growth, e.g., because political freedom produces an electoral pressure in favor of redistribution. Others have argued that democracy is beneficial for economic growth, e.g., because property rights over-all tend to be safer (due to a more accountable government). Yet others have argued that there might be a less clear relationship, e.g., a curvilinear relationship where an increase in democracy up to a certain point leads to economic growth, but after which the negative effects set in and lead to lower growth (Plümper and Martin 2003). However, so far the empirical results have also been far from clear and unequivocal, i.e., it is not at all clear whether the extent of democracy *per se* has a positive or a negative effect (or no effect) on economic growth, and thus whether the regime form more generally affects prosperity. This lack of evidence perhaps suggests—as Przeworski and Limongi have argued (Przeworski and Limongi 1993: 65)—that the democracy-autocracy distinction may be the wrong political variable to consider, because it may not capture the relevant institutional differences in relation to explanations of variations in economic growth rates.

Nonetheless—or perhaps for that very reason—there has in recent years been an increase in interest in the potential effects of constitutions and various specific political institutions for the importance of macroeconomic consequences, including economic growth.[3]

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[3] See, e.g., Knack and Keefer 1995; Henisz 2000; Stasavage 2002; Kurrild-Klitgaard 2001; Kurrild-Klitgaard 2002; Kurrild-Klitgaard 2003; Persson and Tabellini 2003, to mention just a few. For some surveys of related literature, see,

The purpose of the present study is to contribute to this literature by investigating what role—if any—a particular set of political institutions have for economic growth: The protection of private property rights and the configuration of veto players in a political system.[4] Our contribution is thus the following: First, we give a public choice theoretical perspective on the relationship between, on one hand, property rights and the separation of powers and on the other hand economic growth. We do so through some simple game theoretical models illustrating the absence or presence of specified and enforced property rights and of a separation of political power between more veto players—and how this may influence economic decisions. Such an analysis may be seen as essentially investigating what might be called a "Madisonian" model:[5] One that argues that in order to promote mutually advantageous relationships it is necessary to develop a constitutional framework that combines a separation of powers among several, different veto players with a secure protection of fundamental liberties.

The second contribution of the paper is an empirical analysis of the potential relationships between the political-institutional variables and economic growth, which is undertaken by using panel data for a broad sample of countries of the world for the period 1980-2000. We do this rather than simply analyzing average data for a cross-country selection of countries, and we furthermore conduct robustness tests for the institutional variables through a series of "extreme bounds" analyses.

So, in the following we first present the theoretical perspectives regarding the importance of private property rights, political veto

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e.g., Holcombe 2001; Kurrild-Klitgaard and Berggren 2004; Haan, Lundström and Sturm 2006.

[4] For early applications of similar designs, see Kurrild-Klitgaard 2001, Kurrild-Klitgaard 2002, Kurrild-Klitgaard 2003, Justesen 2004 and especially Justesen 2006.

[5] Cf. Hamilton, Jay and Madison [1787] 2001; Madison 1962. Another term for such a view might be a "constitutional liberalism", cf., e.g., Zakaria 2003; Kurrild-Klitgaard 2006.

players and economic growth (section 2), and subsequently we describe the data and statistical methods used (section 3), followed by the empirical analysis itself (section 4). In conclusion we summarize the most important results.

2. Public choice theory and institutions

Public choice theory is generally understood as being a term signifying the application of the concepts and tools of economic theory for the study of politics (Mueller 2003). Accordingly, the analysis of political and economic processes is based in models of individual actors as being rational maximizers of their subjective expected utility. Actors are, in other words, presumed to act rationally and choose the most efficient means to pursue given goals, while taking the relevant costs and benefits of the situation into consideration. Given such an approach institutions are, first and foremost, seen as ”humanly devised constraints that shape human action” (North 1990: 3). Institutions are thereby the formal and informal rules that influence human action by limiting and determining the set of possible actions, in particular by assigning costs and benefits to alternative actions.

With regard to economic behavior on markets the importance of political institutions is that economic systems in all of the modern world are embedded in political systems (North 1990: 48; Weingast 1995). Political institutions specifically affect 1) the set of allowed actions and strategies, and 2) the relative prices of choosing one action (political or economic) rather than another (Brennan and Hamlin 1995: 288). This creates a structure of incentives that will influence both the economic behavior of individuals and their political decisions. Institutionally induced costs will generally tend to decrease the performance of costly behavior, while other types of behavior may be encouraged and become more advantageous, and both will affect the coordination of economic actions and specify the extent of institutional limits on the power of political decision-

makers, i.e., the costs of making political decisions and what the content of these must or cannot be (Buchanan 2000).

The political economy of private property

Given the view of institutions described here and given that individuals are assumed to behave as rational utility-maximizers, the question becomes one of what consequences a set of political arrangements may have and what implications this has for economic growth. Fundamentally, economic growth presupposes that the actions and interactions of individuals are productive, and that there is a structure of incentives that encourages these to engage themselves in productive behavior and trade rather than in destructive, exploitative and purely redistributive behavior (Olson 2000: 1). The presence of private property rights and an efficient enforcement of these and of contracts will contribute to the definition of such a structure of incentives, and any set of institutional arrangements will tend to affect the costs or benefits on different types of behavior relative to each other (cf. Buchanan 2000). The economic consequences of alternative degrees of protection of property rights may be illustrated by comparing the interaction between individuals in a state-of-nature situation, where property rights are not enforced with a similar situation where an efficient constitutional order affects the relative costs and benefits of alternative actions in such a way that it makes the interaction productive. This may be done through some simple game theoretic forms as done in figures 1 and 2.[6]

The matrix of figure 1 illustrates a strategic-form version of a game situation with two individuals, I and II, who are modeled as if they were interacting simultaneously in a state-of-nature, i.e., in a condition with no organized enforcement of private property. The players each have two alternative strategies: Either survive by

[6] Such a game is frequently used to illustrate a state-of-nature, e.g., in Buchanan and Tullock [1962] 2004: ??; Tullock 1974: ??; Buchanan [1975] 1999: ??; Wagner and Gwartney 1988: 30-33; Buchanan 2000: ??; Kurrild-Klitgaard 2001: 43-45; Kurrild-Klitgaard 2003: 9; cf. Mueller 1997: 125-127.

plundering and stealing the other player's property (S) or alternatively not doing so (S'), and presumably obtaining what he needs through production and exchange, even at the risk at being submitted to plunder himself. The symbols in the cells represent the respective payoffs to the two players, with player I's in the south-west corners and player II's in the north-east. The utility of the payoffs to each of the players may be assumed to be $u_i(\alpha) > u_i(\beta) > u_i(\lambda) > u_i(\delta)$, thus resulting in individual preference orderings over the payoffs that may be given as such: $\alpha_i \succ \beta_i \succ \lambda_i \succ \delta_i$.

Figure 1: Interaction in a state-of-nature

		II: S'	II: S
I: S'		β / β	α / δ
I: S		δ / α	λ / λ

So, in a world where institutions do not enforce property rights, each individual has an incentive to engage in plunder rather than not do so. In the game of figure 1 there are no costs associated with such behavior, and it is therefore profitable to plunder rather than produce: Each player prefers an outcome where he himself plunders (S), while the other does not (S'), which will result in the maximum payoff (α). However, this results in an outcome (S, S), which is the game's only Nash equilibrium; here they both receive a payoff λ which means that they find themselves in a Pareto-inferior situation.[7] No matter what the other player does, it is always

[7] This will also be the outcome (the sub-game perfect equilibrium), if the game is played sequentially and solved by backward induction.

advantageous to steal his property (Tullock 1974; Buchanan [1975] 1999).

The social dilemma of figure 1 thus constitutes the well-known Prisoner's Dilemma situation, i.e. one where there is no mechanism that will lead the players to choose strategies which simultaneously are both individually and collectively optimal. The individually rational strategies will accordingly lead to a collectively suboptimal outcome.

In figure 2 this situation has changed dramatically, since we have assumed that there is a constitutional order which assigns each player a set of property rights, defined as the right to control, use and invest resources, as long as the identical rights of others are not violated (Leblang 1996: 7; North 1990), and where these are efficiently enforced.

Figure 2: Interaction under an efficient constitutional order

			II	
			S′	S
I	S′	β	β	α-σ δ
	S	δ α-σ		λ-σ

This outcome obtains when actions of the type *S*—i.e. violations of property rights—are accompanied by a cost σ, with $\sigma < 0$. That is, σ represents a private and negative payoff, which exclusively is associated with individual violations of private property rights. The players' individual choices of strategies now depend on the relative size of σ. If σ is sufficiently small, i.e. close to zero, then the structure of the game does not change but remains of a Prisoners' Dilemma character. However, the game changes structure if $\beta > \alpha\text{-}\sigma$ or if $\sigma > \alpha\text{-}\beta$, i.e., if the costs of non-cooperative behavior is

sufficiently large. In that case the players will choose the strategy *S′*, where they engage in trade and production rather than plunder. This will lead to a new structure of the game, which now has a unique Nash equilibrium, (*S′*, *S′*), which also is a Pareto-optimal outcome—and one where both players behave in a productive way.

Achieving such a cooperative outcome—understood as one where property rights are not violated—will accordingly take place if a set of institutions introduces sanctions that will make non-cooperative behavior costly, so that the payoffs from cooperation exceeds the payoffs from plunder. The institutionalization of property rights in other words makes behavior predictable—and predictable in a productive direction because they will increase the incentives of humans to devote their time, labor and capital in production and exchange. In contrast, insecure property will increase the risk that the return on such activities is lost. All in all, this suggest that secure property rights are an absolute necessary precondition for economic growth to occur (Leblang 1996: 7). On this background it becomes likely that the presence of private property rights will create an incentive structure that will stimulate the extent of productive behavior and private investments and which will thereby lead to economic growth and—over time—to higher levels of prosperity.

Political institutions, dynamic games and time inconsistency

An important implication of the previous analysis is that rational, utility-maximizing actors may benefit from an institutional arrangement that limits their own behavior relative to each other. There are, so to speak, benefits to be reaped from tying each other's hands (Elster 1985). This is the well-known argument from both classical and modern social contract theory (cf. Hobbes [1651] 1991; Locke [1690] 1988, viz. Buchanan [1975] 1999; Hampton 1986). In some cases, such solutions may be seen as arising from a semi-contractual process; in other cases in may come about in an evolutionary and decentralized fashion; in yet other cases it may involve bandits who in order to reap rents for themselves will have

an incentive to both monopolize the use of violence and offer such public goods as law, peace and protection against arbitrary plunder and expropriation (Olson 1993; Olson 2000; Kurrild-Klitgaard and Svendsen 2003). However, we need not presently be concerned with whether or not such arrangements have arisen through a social contract, or whether or not they could or would do so; the more important point is simply that institutionalized limits on the use and abuse of violence by individuals, so as to let them have security in their property, will tend to be in their mutual interests, no matter the origin (cf. Hume [1777] 1985). Yet, irrespective of the origin and exact form of the protection of property rights, a central problem remains with regard to preventing those entrusted with the power of enforcing rights: How is it possible to credibly commit the agent to only enforcing the protection of property and not expropriating it? Who guards the guardians? In particular, when we are dealing with the centralized monopoly on the use of violence constituted as the state, what will prevent those exercising government powers from exploiting their privileged position for the confiscation of accumulated wealth?

This is, what Barry Weingast has referred to as the fundamental political dilemma for any political-economic system (Weingast 1995: 1). The dilemma consists in the fact that the presence of a government strong enough to enforce property rights in general may be a necessary precondition for this to occur, but that the government's strength simultaneously may constitute a potential threat against the very rights it was supposed to protect. In this case, the government's ability to credibly commit itself to a set of institutions and policies, that will protect private property and be generally conducive to economic growth, will be crucial. It all relates to the so-called "time inconsistency problem", which Blanchard and Fischer define as such: "A policy is dynamically inconsistent when a future policy decision that forms part of an optimal plan formulated at an initial date is no longer optimal from the viewpoint of a later date, even though no relevant new information has appeared in the meantime." (Blanchard and Fischer

1989: 592). That is, to the extent that a set of (Pareto-optimal) policies that have been passed a time t_0, may be changed or modified at a later time t_{0+n}, even though there is no new or relevant information that may explain or justify it, the decision to do so might be said to be dynamically inconsistent (or time inconsistent). This problem is particularly relevant in the light of the fact that many economic activities and investments are irreversible and thereby have the character of being "sunk costs," which, when they have been undertaken, cannot be undone (Stasavage 2002: 41). This creates an asymmetry in relation to the character of political decisions, which in contrast often are reversible and therefore can be undone at a later time. If an investor fears that a government has an incentive to expropriate property or suddenly and arbitrarily increase the taxation of profits *ex post*, this will create an incentive for postponing the activity, changing it or altogether abstaining from engaging in it. The decisions of economic actors with regard to investment, production, trade, etc., accordingly depend not only on previous or contemporary policies and institutions but also, and not least, on their expectations with regard to future policies and the institutions that will regulate the choice of future policies (Kydland and Prescott 1977: 474; cf. Mises [1949] 1966).

Regimes, democracy and economic growth

The question thus becomes how political institutions may be designed so that economic agents will be most likely to form correct expectations with regard to future policies and institutions and notably in such a way that they will have confidence that their activities will be worthwhile.

Traditionally the literature on political institutions and economic growth has tended to focus on the relative merits of democracy versus autocracy when it comes to the protection of property rights, investments and economic growth (cf. Przeworski and Limongi

1993; Olson 1993; Olson 2000).[8] A prominent argument for why democracies should be better at protecting private property is that the electorate has the regular ability to put politicians out of office, and that this may act to discipline politicians with regard to their economic policies (at least compared to those who are not up for reelection), and that this should encourage politicians to take consideration of the broad interests of the electorate rather than the more narrow interests of special interest groups (Olson 1993: 572; cf. Olson 2000). On the other hand, it has been argued that exactly the sensitivity of politicians to electoral pressures may lead to massive redistribution that will tend to divert resources away from long-term beneficial investments in favor of short-term consumption (Meltzer and Richard 1981; Przeworski and Limongi 1993). If that is the case, then it might hamper economic growth and perhaps even lead to recessions, etc. As opposed to this autocracies, according to some, could be seen to be better as resisting and suppressing pressure from the voters in favor of higher salaries, increased public spending and intervention and may instead force decisions through which perhaps are not very popular but may be necessary in order to foster growth.[9] Others have similarly argued that under a democratic process politicians necessarily must react responsively to special interest groups and that this will lead to an underinvestment in public goods and with resources instead going to narrow interests (Olson 1982), while autocracies on the other hand—because of their relative autonomy from the electorate—may better withstand pressure from special interest groups and successfully exclude these from the decision process, so that resources may be invested in a

[8] The most important aspects of democracy would for present purposes be seen as being the minimal procedural elements relating to the possibility of participating in elections that are free, fair and open to competing parties/candidates; in autocracies such procedural elements are either not part of the political process or suppressed (cf. Dahl 1998; Tsebelis 2002: 68-70).

[9] This argument may be found in some form in, e.g., Rodrik's analyses of the development of South Korea and Taiwan under autocratic regimes (Rodrik 1997; Rodrik 2005).

more efficient way (Haggard 1990: 261-262; Przeworski and Limongi 1993: 55-57).

The theoretical implications of democracy versus autocracy are accordingly not unequivocal. Combined with the fact that many empirical investigations have not found clear effects of either democracy or autocracy on growth, this means that the political regime type perhaps does not have the great importance for economic growth (Przeworski and Limongi 1993; Knack and Keefer 1995; Przeworski et al. 2000; Krieckhaus 2004), or alternatively at least not unequivocal effects, e.g., that there may be a non-linear relationship between democracy and economic growth (cf. Barro 1997; Barro 2000b).

Veto players, transaction costs and economic growth

In recent years some scholars have focused on the possibility that the best way to increase the credibility of future political decisions is by designing political institutions in such a way that they will impose direct or indirect restrictions on the possibilities of politicians acting discretionarily and arbitrarily. North and Weingast have, for example, argued that the economic progress of Britain in the years following "The Glorious Revolution" of 1688 was made possible by the fact that the king lost control of many of his legislative rights and privileges (North and Weingast 1989). Specifically, the introduction of a constitutional separation of powers between parliament and king that the latter could no longer unilaterally expropriate wealth; quite on the contrary, the king was now forced to obtain the explicit consent of parliament for the collection of taxes and the taking of new loans.[10]

At a more general level the narrative provided by North and Weingast indicates that it is first and foremost the number and configuration of veto players in the political system that has an importance for the extent to which there exist credible limits with

[10] See North and Weingast 1989: 815-817. For a somewhat dissenting public choice analysis, see Rowley and Dobra 2003.

regard to the possibility of political decision-makers to act discretionary and opportunistically (cf. Henisz 2000; Stasavage 2002).[11] A veto player may in this context be defined as a political actor whose consent (or at least *nil obstat*) is necessary in order for a change to take place in the political status quo, i.e., in order to change a set of existing policies (Tsebelis 2002: 19; cf. Tsebelis 1995).[12] A necessary requirement for changing status quo is thus that an agreement to do so is reached among all the relevant veto players. The number and configuration of veto players in a political system accordingly expresses the extent of relative separation of power within that system, i.e., the extent to which power is concentrated in one actor of divided between two or more veto players.

The fact that a separation of powers institutionalizes a requirement of unanimity among the relevant veto players means that the transaction costs of making a political decision increase relative to situations where only one political actor has the discretionary power to make the ultimate decision. Transaction costs may, following North, be defined as "the cost of measuring the valuable attributes of what is being exchanged and the cost of protecting rights and policing and enforcing agreements" (North 1990: 27). Political transaction costs accordingly are made up by the costs relating to the making of the decision, as well as the costs related to its enforcement (Berggren and Karlson 2003: 103; cf. Buchanan and Tullock [1962] 2004). In the terminology of veto players this means that the political transaction costs, C, may be approximated by the function $C = f(V + H)$, where V measures the number of veto players and H measures their political-ideological compatibility. That is, the political transaction costs are a function of the number of veto

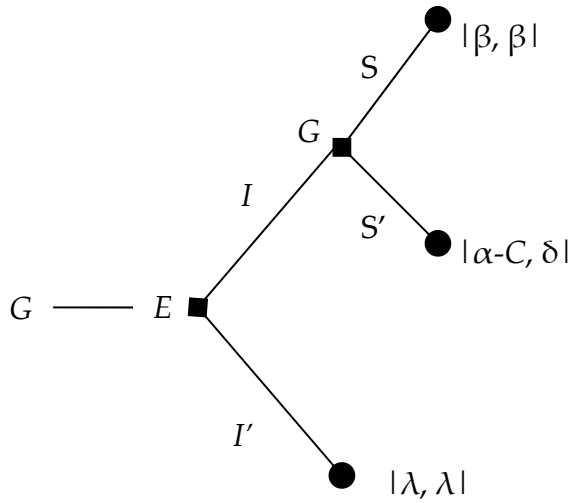
[11] The configuration of veto players is the number of veto players combined with actual political/ideological distance between them.

[12] Veto players may be explicitly defined by a constitutional arrangement (e.g. a president or a second chamber which function as veto players to a first chamber) or they may be *de facto* and partisan in character (such as a coalition partner in a multiparty government).

players and the distances between them (Tsebelis 2002: 26-33; Henisz 2000: 4-8).

The question then is what the potential economic consequences are of political systems with different configurations of veto players and, as a consequence, of different sizes of political transaction costs. The thesis of North and Weingast may more formally and yet very simplified be illustrated by the extensive form game tree of figure 3, which in essence displays an expanded version of a Prisoners Dilemma-like interaction.[13] The game tree may in principle be used for the illustration of two different scenarios: One where the political power is concentrated in the hands of one veto players, and another where political power is divided among several veto players.

Figure 3: A dynamic game between veto player(s) and an economic investor.



t_0 ----------t_1 ----------t_2

Scenario 1: Concentrated political power

[13] We have here presented it as such since this game, in essence, is characterized by being sequential in nature rather than one with simultaneous moves.

In the first scenario it is assumed that the interaction takes places between two players. The one is a veto player, *G*, who possesses discretionary political power, and may choose between seizing the property of the citizens (*S*) or not doing so (*S′*). The second player is *E*, who is an actor on the economic market who has to choose between two alternative strategies, namely to either invest in the economy in question (*I*) or not do so (*I′*). The interaction is presumed to take place with consecutive moves over two time periods (t_1 and t_2), albeit with *G* having previously given a promise of not intervening. The symbols at the end-nodes give the relevant payoffs of the individual players given alternative strategies, with the first symbols giving *G*'s payoff and the second giving *E*'s. *G*'s utility function is presumed to be specifiable by the ordering:

$$u_G(\alpha) > u_G(\beta) > u_G(\lambda),$$

while *E*'s utility function is given by:

$$u_E(\beta) > u_E(\lambda) > u_E(\delta).$$

Given these assumptions the collectively optimal result is one, where *E* chooses to invest, while *G* chooses to honor his original commitment. If *E* chooses not to invest, then he will be guaranteed a payoff λ, whereby he secures himself the better of the two worst outcomes, i.e., a kind of "maximin" strategy.

Before the first round of the game, *G* could at time t_0 issue an *ex ante* promise to *E* about his own future behavior, should *E* choose to invest (*I*). *G* might for example promise *E* not to expropriate or increase taxation on *I*'s investment, i.e., play strategy *S′*. *G*'s alternative, given that *E* chooses to invest (*I*), is in period t_2 to seize *I*'s investment (i.e. play *S*). However, reneging on the original promise from period t_0 will result in a cost *C*, which must be subtracted from the benefits gained by accumulating *E*'s property (α).

Problems arise when the transaction costs, C, in a situation with only one veto player are relatively small, because in that case it becomes relatively cost-free for G to renege on his original promise in period t_2. If we make the simplifying assumption that $C \approx 0$ in political systems with only one veto player, then the problem arises because E may form the expectation that G's promise is not credible, since the incentives will be incompatible *ex post*. So, if E chooses to invest and the game proceeds to period t_2, then G will have an incentive to choose S rather than S' because this provides him with the payoff α rather than β. But because $u_G(\alpha) > u_G(\beta)$, G thereby has an incentive to behave in a time-inconsistent manner by first promising (at t_0) not to intervene and then to subsequently renege on the promise (at t_2), but as a consequence thereof E will choose not to invest (I'), resulting in the game ending in the sub-game perfect equilibrium situation corresponding to the suboptimal payoffs $|\lambda$, $\lambda|$.

The general problem of the game thus consists of the fact that the players despite an obvious incentive to engage in agreements or making optimal promises *ex ante* often do not have an incentive to honor such promises *ex post* (North and Weingast 1989: 806; Shepsle 1991: 247). This problem is exacerbated in the example considered here by the feature that the political decision-maker has discretionary power: This gives the player privileged ability to unilaterally and arbitrarily renege on promises and other non-enforceable agreements—including his own policies—and thereby act in an opportunistic manner. On this background it is to be expected that political systems that institutionalize a high degree of political power in one, single veto player will impose a negative effect on the incentives of economic agents with regard to investing and producing and thereby upon economic growth.

However, this thesis is conditional on two factors. First of all, the time-horizon may often vary among political veto players. If the power position of the veto player is relatively unchallenged and secure, he will have a strong incentive to act in a future-oriented, long-term manner, since the future tax revenues of present-day

decisions will belong to him rather than someone else (Olson 2000). Secondly, the representation of interests in the political system has consequences for the ability of veto players to credibly commit themselves to private property and other growth promoting institutions and policies (North and Weingast 1989; Stasavage 2002: 44-45; Olson 2000: 14-23). The reason for this is that the power-base and political and financial supporters of a political veto player to a larger or smaller extent may reap benefits from specific policies, and veto players whose support is dependent on actors and groups with considerable capital, production and investment related interests will often have a particular interest in protecting and enforcing property rights, contracts, etc.

An illustrative example of how political veto players with concentrated powers may credibly commit themselves to growth promoting policies has been provided by Campos and Root (Campos and Root 1996), who have pointed toward the so-called "deliberation councils" (with representatives from business and government) in South East Asian countries as having contributed significantly to the economic success of these countries; these councils in reality had de facto status as veto players with regard to the choice of and changes in economic policies, and they thereby institutionalized an informal separation of powers. In the case of Asia this made the institutions and economic policies more trustworthy by limiting the political discretion of the government. By reducing the politically generated uncertainty it created a structure of economic incentives which to a high degree encouraged investments and contributed to the generation of growth. In contrast, there are numerous examples—most recently from Robert Mugabe's regime in Zimbabwe—that illustrate how solitary political veto players with *de facto* more or less unlimited discretionary powers have contributed to running whole economies into the ground (Wintrobe 1997). As these examples illustrate, the group of political systems with one single veto player may be a relatively heterogeneous one when it comes to the protection of private property and the ability to generate economic growth, and this is a

fact which quite naturally will complicate the picture of any relationships between veto players and economic growth.

Scenario 2: Separation of political power

The next question becomes what the economic implications might be of the presence of increased transaction costs which conceivably may be found in systems with multiple veto players. If we reconsider figure 3, the presence of multiple veto players will entail that the size of political transaction costs, *C*, increase, i.e., for *G*, which now represents a government with a number of veto players ≥2, actions of the type *S* will now be associated with costs of a size *C*, which must be deducted from the benefit α which derives from reneging on the original promise of not expropriating property. This follows from the fact that breaking the *ex ante* promise of not expropriating *E*'s investments now will have to be passed unanimously among the veto players. Accordingly, *G* will not renege on the original promise as long as $\beta > \alpha$-*C*, or as long as $C > \alpha$-β. In other words, increased political transaction costs will, everything else being equal, make it less attractive—and in some cases extremely difficult—for political veto players to behave in a time inconsistent manner.

Player *E*'s actions in figure 3 will also depend on the relative size of *C*. Seen from *E*'s perspective the size of the political transaction costs may be translated as an exogenously given probability that *G* will honor his original promise. If we assume, as above, that λ represents the "maximin"-payoff for *E* (i.e., the maximal minimum payoff that *E* may secure himself), then *E* will choose to invest in instances where $\lambda < \beta(C) + \delta(1\text{-}C)$, where *C* represents the probability that *G* plays *S'* and thereby refrains from expropriating *E*'s investment. Since the probability that *G* will play *S'* is derived from the size of the political transaction costs, the incentives to invest will, everything else being equal, increase with increasing political transaction costs, since these will increase the probability of a successful realization of the benefit β. In the example

here the implication of an increase in the number of veto players (from one to more) is that the incentives and abilities of the political veto players to act in a time inconsistent manner will diminish simultaneously with an increase in the incentives of investors to invest.

A contributing factor for this is that political systems with multiple veto players to a large degree increase the diversity of the interests represented in the political system, and that the policy preferences of the veto players with regard to protecting private property, investments and production, etc., may be expected to generally be more heterogeneous. That is, the probability that at least one veto player has an interest in protecting private property and bloc time inconsistent and economically sub-optimal decisions will increase with the number of veto players (Stasavage 2002: 45). This does of course not mean that the presence of multiple veto players necessarily will mean that time inconsistent actions will not occur. Furthermore, the actual political transaction costs from making political decisions may turn out to be small in some systems, namely when the policy preferences of the veto players are relatively homogenous. The point is rather that the presence of multiple veto players quite generally will tend to reduce the politically generated uncertainty for economic investors.

Political veto players and institutional inertia

The argument given here stands in some contrast to other, more mainstream conceptions among political scientists, including several who also work within a public choice framework. Their analyses of political institutions, veto players and political transaction-costs have tended to emphasize the positive effects of political institutions that make it possible for decision-makers to make decisions and implement these as relatively costless as possible (cf., e.g., Weaver and Rockman 1993a). One such argument often found is that political systems with multiple veto players exhibit institutional inertia and act slowly, thus institutionalizing a "conservative" bias that will hamper political flexibility and perhaps lead to a sub-

optimal supply of public goods (Cox and McCubbins 2001). The consequence may be institutional "grid-lock," where conflicts between two or more veto players (e.g., a parliament and a president) in extreme cases make it impossible to take the necessary political decisions, for example changes in macro-economic policies or reactions to negative, exogenous chocks to the economy (Cox and McCubbins 2001: 29-30; Linz 1994: 8-10). Similarly it may be argued that the separation of powers among multiple veto players cannot be expected to lead to a particularly growth promoting set of policies, because the situation simply leads to a "lock in" of existing policies at a status quo level—and a status quo that might not itself be beneficial for economic growth (Tsebelis 2002: 204). The potential economic benefits of a political system with multiple veto players (increased credibility and stability) must accordingly be balanced against the potential costs in the form of a loss of ability to make the right decisions when they are needed.

If such arguments are correct, then we should not expect the existence of multiple veto players to necessarily have a particularly positive effect on economic growth. However, since such conclusions seem clearly at odds with the inferences drawn here, it must ultimately be an empirical question whether the one or the other must be rejected, or possibly both of them.

A Madisonian constitutional order

There are obvious similarities between the conclusions reached here and those made by US Founding Fathers such as James Madison. It has indeed occasionally been said that the central argument set forth in *The Federalist Papers* (Hamilton, Jay and Madison [1787] 2001) was one that might easily be recast in the modern language of public choice economics (cf. the papers in Grofman and Wittman 1989; Buchanan 1983; Dorn 1988; Dorn 1991; Easterbrook 1994).

Specifically, The Founders may be seen as having been faced with the fundamental problem of how to design a constitutional order that protect the basic individual rights of life, liberty and property and on the other hand doing so while simultaneously providing for

a democratic republic that is both sufficiently strong to do so and yet not unnecessarily so. As Madison famously warned:

> "If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable government to control the governed; and in the next place oblige it to control itself." (Federalist No. 51, in Hamilton, Jay and Madison [1787] 2001: ??)

Madison specifically warned against the problems of "faction" in an unlimited democracy, where too much power would be concentrated and unchecked in the hands of a central government. The latter Madison found to be "incompatible with personal security or the rights of property" (*Federalist* No. 10), and the protection of the latter Madison saw as the fundamental task of government:

> "[Property] in its particular application means 'that dominion which one man claims and exercises over the external things of the world, in exclusion of every other individual.' In its larger and juster meaning, it embraces every thing to which a man may attach a value and have a right; and *which leaves to every one else the like advantage.* In the former sense, a man's land, or merchandize, or money is called his property. In the latter sense, a man has a property in his opinions and the free communication of them. He has a property of peculiar value in his religious opinions, and in the profession and practice dictated by them. He has a property very dear to him in the safety and liberty of his person. He has an equal property in the free use of his faculties and free choice of the objects on which to employ them. In a word, as a man is said to have a right to his property, he may be equally said to have a property in his rights.
>
> Where an excess of power prevails, property of no sort is duly respected. No man is safe in his opinions, his person, his faculties, or his possessions. …
>
> Government is instituted to protect property of every sort; as well that which lies in the various rights of individuals, as that which the term particularly expresses. This being the end of government, that alone is a

> *just* government, which *impartially* secures to every man, whatever is his *own*. …
>
> That is not a just government, nor is property secure under it, where the property which a man has in his personal safety and personal liberty, is violated by arbitrary seizures of one class of citizens for the service of the rest. …
>
> That is not a just government, nor is property secure under it, where arbitrary restrictions, exemptions, and monopolies deny to part of its citizens that free use of their faculties, and free choice of their occupations, which not only constitute their property in the general sense of the word; but are the means of acquiring property strictly so called. …
>
> A just security to property is not afforded by that government, under which unequal taxes oppress one species of property and reward another species: where arbitrary taxes invade the domestic sanctuaries of the rich, and excessive taxes grind the faces of the poor; where the keenness and competitions of want are deemed an insufficient spur to labor, and taxes are again applied, by an unfeeling policy, as another spur; in violation of that sacred property, which Heaven, in decreeing man to earn his bread by the sweat of his brow, kindly reserved to him, in the small repose that could be spared from the supply of his necessities. …
>
> If the United States mean to obtain or deserve the full praise due to wise and just governments, they will equally respect the rights of property, and the property in rights: they will rival the government that most sacredly guards the former; and by repelling its example in violating the latter, will make themselves a pattern to that and all other governments." (Madison [1792] 1906: 101-03)

Madison and fellow founders foresaw that unlimited democracy might lead to a pressure for redistribution that would undermine property rights (cf. Pipes 1999: 114). Madison's constitutional remedy was to divide power among different levels (federal and state) and different branches of the federal government through the institutionalization of what we here have called veto players: "The preservation of liberty", Madison argued, "requires that the three great departments of power should be separate and distinct" (Federalist No. 47, in Hamilton, Jay and Madison [1787] 2001: ??). More specifically,

> "In the compound republic of America, the power surrendered by the people is first divided between two distinct governments, and then the portion allotted to each subdivided among distinct and separate departments. Hence a double security arises to the rights of the people. The different governments will control each other, at the same time that each will be controlled by itself." (Federalist No. 51, in Hamilton, Jay and Madison [1787] 2001: ??)

3. Data and methods

The purpose of the empirical analyses is to test the possible roles played by effectively enforced private property rights and by the configuration of institutionalized political veto players for economic growth. For this purpose we conduct a number of statistical analyses on panel data for a broad sample of countries for the period 1980-2000 with economic real growth as the dependent variable.[14] In the present section we first describe the institutional variables included in the analyses and we then explain the method for evaluating the robustness of the empirical tests, including the possibilities and problems that follow the use of panel data.

Institutional variables

In order to test our theoretical models we need a measure of how secure private property rights are. As a proxy for this we have chosen to isolate and utilize that component of the Fraser Institute et al.s *Economic Freedom of the World Index* (Fraser Institute 2002; cf. Gwartney, Lawson and Emerick 2003) which exclusively relates to the protection of private property rights and the independence of the judicial system (Gwartney and Lawson 2003).[15] The advantage of

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[14] Real growth in GDP per capita is measured in purchasing power parity adjusted, constant 1996 prices (Heston, Summers and Aten 2002).

[15] The data used for these components originally derive from PRS Group's *International Country Risk Guide* (ICRG) and World Economic Forum's *Global Competitiveness Report*. As such both are based in expert surveys, external to the

isolating this component is that it should result in a relatively narrow institutional measure of the extent of the security of private property—something that may increase its validity as an explanatory variable. Specifically, the property rights variable captures an essential part of the institutional setting within which economic activities take place rather than, say, the more policy oriented effects measured by the over-all index of economic freedom.

For the purpose of measuring the configuration of veto players we utilize data from the so-called *Database of Political Institutions*, which has been developed by researchers affiliated with the World Bank. The database includes a component abbreviated here as *Checks*, which expresses the degree of separation of powers (or "checks and balances") within a political system (Keefer 2002; World Bank 2002a).[16] The *Checks* index (which here is included with a one year lag) attempts to measure the number of veto players that share political power in a given country; it does so by counting, on the basis of objective empirical criteria, the number of players and the degree of homogeneity of their policy preferences. Specifically, the index includes information about the separation of power between constitutional veto players (e.g., a president with veto powers, more than one chamber of parliament, etc.), as well as the presence of coalition governments that may increase the number of partisan veto players.[17] The values of the *Checks* index thus rise with an increasing number of veto players but falls when the policy preferences of the veto players are homogenous.

Sensitivity tests, control variables and outliers

Economic Freedom of the World Index. For details, see, e.g., Gwartney, Lawson and Easterly 2006: 10-11.

[16] The *Checks* index has for the present purposes been logarithmically transformed in order to consider the possibility that a move from one to two veto players may have a larger effect than a move from, say, three to four veto players (cf. Stasavage 2002: 50).

[17] For a more detailed description, see Keefer 2002.

Empirical growth regressions often suffer from two problems that may affect the parameter estimates and conclusions regarding the effects of the explanatory variables (Temple 1999; Haan and Sturm 2005; Haan 2007). The first problem concerns the robustness of the relationship between the variables; the second concerns the importance of extreme observations ("outliers").

The robustness problem stems from the fact that empirical growth regressions often rely on a very large number of explanatory variables (cf. Sala-i-Martin 1997). However, Levine and Renelt have through the use of so-called "extreme bounds analysis" (EBA) demonstrated that many of these variables are not robust when changes in the set of explanatory variables occur (Levine and Renelt 1992). Through an application of the same method, Krieckhaus has similarly found that the effects of democracy on economic growth are not unequivocal over time (Krieckhaus 2004). Nonetheless, by far the most studies of the relationship between institutional variables and economic growth do no use the EBA methodology. However, in order to investigate the robustness of the empirical results the analyses conducted here will be conducted through the use of the Levine and Renelt's EBA methodology. This method involves the estimation of a series of regressions where the explanatory variables may be divided into groups as done in equation (1):

$$Y_{i,t} = \upsilon + \beta_{\mathrm{i}}\mathbf{I}_{\mathrm{i,t}} + \beta_{\mathrm{m}}\mathbf{M}_{\mathrm{i,t}} + \beta_{\mathrm{z}}\mathbf{Z}_{\mathrm{i,t}} + \varepsilon_{i,t}, \qquad (1),$$

where Y represents the dependent variable, economic growth. In equation (1) **I** consists of a set of basis variables that are always included in the regressions, **M** is the set of institutional variables to be investigated, while **Z** contains a sub-set of the other variables that may be seen as potentially having an impact on economic growth. The idea behind the EBA tests then is to vary the group of **Z**-variables in order to discover the most extreme upper and lower values for the coefficients of the **M**-variables, β_{m} (Levine and Renelt 1992: 944). By conventional standards the extreme upper and lower

limits for the β-estimates may be defined as the interval between the highest and the lowest β_m +/- 1.64 standard error (i.e. max. and min. β_m +/- $1.64\sigma_m$). If, for example, the extreme lower value is negative, while the extreme upper value is positive, then the variable, strictly speaking, is not robust (Levine and Renelt 1992: 944; Sala-i-Martin 1997: 178). The point accordingly is that only variables for which the sign of the coefficient does not change, and which remain significant by conventional standards irrespective of the combination of **Z**-variables may be said to be "robust".

Here we follow the set-up of Levine and Renelt, as well as Krieckhaus, and we include four **I**-variables: (ln)BNP per capita (lagged one period); investments as a share of GDP; a measure of the extent of secondary education; and population growth.[18] These are also included as standard variables in most empirical growth analyses (e.g., Barro 1997; Barro 2000a), and they have for that reason been included here, even if it may be reasonably argued that, e.g., investment levels are not truly exogenous.[19] The **Z**-variables consist of a further four variables which a number of earlier studies have included in growth regressions (e.g. Barro 1997; Frankel and Romer 1999; Przeworski et al. 2000): Foreign trade (measured as exports plus imports as share of GDP); the logarithm of the level of inflation; the life expectancy; a measure of democracy. [20] The latter has also been chosen specifically to test the effects of separation of powers when the extent of democracy is controlled for; here we have utilized the component "political rights" from Freedom House's index of democracy (Freedom House 2004), which should

[18] The data for GDP, investment and population growth derive from Heston, Summers and Aten 2002, while education data are from World Bank 2002b.

[19] In Appendix B we have in a simplified table given the results of the analyses conducted here but with investment omitted as a variable. These show that the results do not change much, although property rights actually become more robust without investment, and the coefficients of the analyses of the effects of levels of property rights and veto players are slightly larger.

[20] Data for trade are derived from Heston, Summers and Aten 2002, while data for inflation and life expectancy are from World Bank 2002b.

provide a relatively unequivocal approximation of the procedural aspects of the democratic nature of the various countries (the possibilities of electoral participation and of party competition). For the present purposes the democracy variable has been transformed to a scale of 0-100, where higher values indicate more democracy. Summary statistics for all these variables are given in Appendix A.

In practice EBA tests of the Levine-Renelt type are conducted by first running a number of basic regressions, where only the base variables (**I**) and the institutional variables (**M**) are included. Subsequently, a series of regressions are conducted where all possible combinations of up to three **Z**-variables are included, following which the extreme values and the levels of significance of the β estimates may be identified. However, it should be emphasized that the EBA tests constitute a very conservative test of the robustness of variables. If a given independent variable does not "survive" the test, this does not necessarily in itself constitute a proof that it does not affect the dependent variable. Rather, the EBA test tells us something about the relationship between **M** and Y and the extent to which this is sensitive to changes in the set of other control-variables. Sala-i-Martin has indeed criticized the EBA test for being too extreme since it very often will be possible to specify a regression model that will make every single variable insignificant (Sala-i-Martin 1997).

The second factor that may affect the parameter estimates in OLS regressions is, as mentioned, the presence of "outliers", in the form of extreme or atypical observations that may have a disproportional large influence on the estimates (Haan and Sturm 2005: 599; Haan 2007). A particular reason for countries appearing as outliers in growth regressions is that the data quality in some cases is very poor and affected by considerable uncertainty (Barro 2000a: 11).[21] This is in particular a problem in the case of poor countries and may manifest itself by these appearing more frequently as outliers. In

[21] Another reason may be parameter heterogeneity, i.e., the possibility that the relationships between the variables are different for different countries (or groups of countries).

order to investigate whether and to what extent extreme observations influence the estimated relationships, the regression analyses have been conducted both with and without outliers.[22]

Panel analysis

Most analyses of the possible relationships between institutions and economic growth use regression analysis for a cross-country sample of countries with data averages for a longer period (e.g., Leblang 1996; Henisz 2000; Krieckhaus 2004). As an alternative, the empirical analyses in the present study have been undertaken with a point of departure in an unbalanced panel data set consisting of a **N** x **T** matrix of more than 100 countries for the period 1980-2000 (T = 21).

The use of panel data has advantages relative to time series data or averages but also creates a number of problems which potentially may create unreliable results and inefficient parameter estimates (cf., e.g., Kittel and Winner 2003; Plümper, Troeger and Manow 2005). Among the advantages of using panel data is, first and foremost, that the number of observations usually increase considerably relative to, e.g., the use of averages for cross-country samples, which thereby adds information about the changes in the variables over time. Furthermore, panel data allows us to use country dummies that will make it possible to take into consideration so-called "omitted variable bias" and unobserved country specific variations (Kittel and Winner 2003; Plümper, Troeger and Manow 2005: 329). On the other hand, the problem with panel data is that the structure of the data means that the assumptions of the classical OLS regression model usually are not fulfilled. This statistical problem arises from the panel data's combination of a time dimension with cross-sectional dimension: The former leads to problems of autocorrelation whereas the latter

[22] For discussions of other methods for handling "outliers", see, e.g., Temple 1999; Haan and Sturm 2005.

creates problems of heteroscedasticity and contemporaneous cross-sectional correlation, e.g., due to common, exogenous chocks.

In our empirical analyses we have tried to handle these problems in the following way. First of all, we have modeled the dynamics of the panel data by including a lagged dependent variable, $Y_{i,t-1}$, so that the model of equation (1) may be rewritten so that it takes the following form:

$$Y_{i,t} = \upsilon + \alpha_i + \rho y_{i,t-1} + \beta_1 X_{i,t} +, \ldots, + \beta_k X_{i,,t} + \varepsilon_{i,t} \qquad (2)$$

The point of including a lagged dependent variable is that it models an autoregressive process, where the coefficient ρ indicates the extent to which economic growth in year t depends on growth in year t-1, so that $E(\varepsilon_{i,t}) \sim \text{IID}(0, \sigma^2)$ constitutes a so-called "white noise" error-term without autocorrelation. Secondly, all the analyses include country specific effects ("fixed effects"). In equation (2) α_i thus constitutes a dummy variable for country i, which contributes to the modeling of heterogeneity, as well as unobserved, time invariant and country specific factors that may influence economic growth. Any remaining variance heterogeneity and cross-sectional correlation is subsequently corrected by the use of robust standard errors or panel corrected standard errors (PCSEs) (Beck and Katz 1995; Beck 2001).

However, the presence of country dummies potentially creates a problem in relation to analyses that aim at discovering the effects of institutional variables: One characteristic of institutions is that they are relatively time invariant, since they often are difficult to change and when they change only do so slowly. In other words, there may occasionally be extremely high (some times perfect) colinearity between the country dummies and the independent institutional variables (Beck 2001: 285; Plümper, Troeger and Manow 2005: 330). The presence of country dummies may therefore contribute to a veiling of the substantial, statistical significance of the institutional variables, even if these in reality have an effect on economic growth,

and whether they should be included in the analyses is accordingly ultimately an empirical question.

4. Results

Table 1 displays the results of a series of regressions using economic growth as the dependent variable and the basis variables and institutional variables as explanatory variables.

The table includes eight different regression models. Models 1-4 include the results for regressions with variables measuring the *levels* of the configuration of veto players and protection of property rights. Models 5-8 in contrast show the results for comparable models but where the regressions include year-to-year *changes* in the levels of these institutional variables (Δ). In order to investigate the importance of outliers the regressions in models 1-8 have furthermore also been made both including and excluding "outliers", which have been defined as observations with standardized residuals being >|3| (cf. Gujarati 2003: 494).

The regression analyses in models 1-4 and 5-8 have been conducted following the same procedures: In models 1-2 and 5-6 we have first tested whether country-specific dummy-variables should be included in order to achieve a correct specification of the model. An F-test shows that this is the case in both sets of regressions.[23] In both the regressions with and without outliers a modified Wald-test indicates that there is still heteroscedasticity present in the residuals. The estimates in models 1-2 and 5-6 have therefore been estimated by the application of robust (White heteroscedasticity corrected) standard errors, while models 3-4 and 7-8 follow the recommendations from Beck and Katz (Beck and Katz 1995; Beck 2001) to use panel corrected standard errors (PCSEs). All in all, the

[23] An F-test for (annual) time dummies found that these were statistically insignificant, and for that reason they have not been included in the regressions. Hausman tests for "fixed effects" vs. "random effects" has also been conducted, and these led to a rejection of random effects models.

regression models 3-4 and 7-8 accordingly produce the most correct model specifications, as they take into consideration both the dynamics and the heterogeneity of the structure of the panel data.

It is evident from Table 1 that the degree of statistical significance for both the levels of the property rights variable and the changes in this is very strong and hardly changes through the use of PCSEs. However, as concerns the veto player variables the use of PCSEs means that in the models that include outliers the standard errors become considerably larger than White standard errors. This entails that the veto player variables become marginally insignificant by conventional standards; however, this result is to some extent a function of the fact that relatively few extreme observations for some particular country/year-observations pulls the estimates relating to veto player variables in a downward direction. If these observations are disregarded, then the configuration of veto players has a larger and statistically significant effect on economic growth (models 4 and 8). The coefficients are so relatively large that they would seem to indicate a non-trivial importance of veto players, even if the results indicate that the growth regressions based on panel data to some extent are sensitive to the presence of outliers.[24]

[24] The extreme observations are exclusively found in the group of poor countries, e.g., Burundi, Chad and Nicaragua.

Table 1: Institutions and economic growth: Base models, panel analyses 1980-2000.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Method	White, FE(C)	White, FE(C)	PCSE, FE(C)	PCSE, FE(C)	White, FE(C)	White, FE(C)	PCSE, FE(C)	PCSE, FE(C)
Outliers?	Yes	No	Yes	No	Yes	No	Yes	No
Institutional variables (M)								
Veto players (log	1.20*	1.60***	1.20	1.60***	-	-	-	-
Checks), *t*-1	(0.70)	(0.59)	(0.78)	(0.59)				
Δ Veto players	-	-	-	-	1.68*	1.56*	1.68	1.56*
(log *Checks*), *t*-1					(0.99)	(0.95)	(1.18)	(0.91)
Property rights	0.75***	0.61***	0.75***	0.61***	-	-	-	-
	(0.19)	(0.16)	(0.18)	(0.15)				
Δ Property rights	-	-	-	-	1.04*	0.96*	1.04*	0.96*
					(0.60)	(0.50)	(0.61)	(0.52)
Basis variables (I)								
Economic	0.04	0.12***	0.04	0.12***	0.07	0.13***	0.07	0.13***
growth, *t*-1	(0.05)	(0.03)	(0.06)	(0.04)	(0.05)	(0.03)	(0.07)	(0.04)
GDP, *t*-1	-7.25***	-5.42***	-7.25***	-5.43***	-6.83***	-5.16***	-6.83***	-5.16***
	(1.25)	(0.93)	(1.96)	(1.34)	(1.27)	(0.95)	(2.11)	(1.46)
Investment ratio	0.15**	0.14***	0.15***	0.14***	0.16**	0.13***	0.16***	0.13***
	(0.07)	(0.04)	(0.05)	(0.04)	(0.07)	(0.04)	(0.06)	(0.04)
Population	-0.86***	-0.84***	-0.86***	-0.84***	-0.87***	-0.95***	-0.87***	-0.95***
growth	(0.19)	(0.14)	(0.18)	(0.14)	(0.19)	(0.15)	(0.20)	(0.13)
Education	0.05***	0.03***	0.05***	0.03**	0.06***	0.04***	0.06***	0.04***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.001)	(0.02)	(0.01)
F (model)	11.56***	16.82***	-	-	8.78***	14.07***	-	-
Observations	1.820	1.782	1.820	1.782	1.707	1.671	1.707	1.671
R^2	0.22	0.28	0.22	0.28	0.22	0.28	0.22	0.28
F (C)	2.65***	2.56***	-	-	2.20***	2.42***	-	-
Hausman, χ^2	718.3***	-	-	-	414.8***	-	-	-
Wald, prob. χ^2	< 0.000	-	-	-	< 0.000	-	-	-

Notes: b-coefficients and standard errors are rounded.

* p < 0.1; ** p < 0.05; ***p < 0.01.

FE(C) = country dummies. Constant and fixed effects are included in all models but not reported.

F(C) = F-test for the inclusion of country dummies.

Hausman test (FE vs. RE) = Hausman test for fixed effects vs. random effects.

Wald, prob. χ^2 = modified Wald-test for heteroscedasticity.

If we consider the substantial meaning of the results as regards the institutional variables, the regression analyses indicate that the extent of protection of property rights and the extent of separation of powers in a political system (as measured by the configuration of veto players) both have a positive effect on economic growth, even when the possible effects of a number of other relevant variables are controlled for. Generally speaking the empirical results thus confirm a considerable importance of the institutional variables, although the effect of the veto players is not statistically significant in all cases (specifically models 3 and 7 where outliers are included).

However, as concerns property rights the results are quite clear: Both a higher level of protection of property rights and changes in that direction associate with higher economic growth rates—and in both cases the results are statistically significant in a very robust way. These results correspond with the results of a number of somewhat similar studies within the field, where more or less different data sets have been utilized and where other techniques have been applied (e.g. Knack and Keefer 1995; Leblang 1996; Henisz 2000; Kurrild-Klitgaard 2001; Stasavage 2002; Kurrild-Klitgaard 2003; Dawson 2003; Justesen 2004). Given the large number of observations and the use of the relevant control variables the present results should be seen as quite clear.

As concerns the remaining basis variables used in the regressions these all have the expected signs, just as they—as expected—all have a positive association with economic growth. High levels of investment and education generally associate with higher growth rates, just as high population growth associates negatively with economic growth. Both the sign and the statistical significance of the lagged GDP variable is also as expected, and this accordingly supports the theory of convergence and corresponds with the conclusions of many empirical growth analyses (e.g. Barro 1997; Knack and Keefer 1995; Henisz 2000). That is, everything else being equal, poor countries will (as predicted by the theory of conditional convergence) grow faster than more prosperous countries. This also indicates that poor countries generally will grow faster than wealthy

countries if they have similar political institutions, and if they also are similar in other respects of relevance for economic growth (e.g., education).

Sensitivity analyses

The question, however, remains whether the results of Table 1 will change, if the set of control-variables is expanded or these are combined in different ways. Following the EBA-tests of Levine and Renelt, we may ask whether the results found so far are robust relative to the EBA methodology?

In order to investigate this, we have conducted a series of "extreme bound" analyses, where the regressions of models 3-4 and 7-8 (i.e. including and excluding outliers) have been repeated but with all the possible combinations of the **Z**-variables of equation (1) being included. The results of the EBA-tests are given in Table 2, which includes the results for both the institutional variables (**M**), the basis variables (**I**) and the **Z**-variables. Columns 1-2 give the results of the EBA-tests with the levels of the institutional variables as **M**-variables, while columns 3-4 give the results for changes in these variables.

Table 2 contains the results of the base regressions of Table 1 (models 3-4 and 7-8), simultaneous with the highest and lowest β–estimates and corresponding standard errors z-values for both the institutional variables, the basis variables and the **Z**-variables. Furthermore, notes have been made with regard to where the variables are statistically significant ($p < 0.05$ and $p < 0.10$). Statistically, there are three points to note: Whether the β–estimates change signs; whether the highest and lowest extreme values are statistically significant with $p < 0.10$; and how frequently a variable "survives" the EBA-test.

Table 2: Sensitivity tests for institutional effects on economic growth, panel analyses 1980-2000.

Model		(1) *(level)*	(2) *(level)*	(3) (Δ)	(4) (Δ)
Outliers?		Yes	No	Yes	No
I-variables					
Veto players (ln	Highest	1.29 (0.77) [1.67]*	1.60 (0.59) [2.73]***	1.82 (1.21) [1.51]	1.56 (0.91) [1.73]*
Checks), *t*-1	Base	1.20 (0.78) [1.55]	1.60 (0.59) [2.73]***	1.68 (1.18) [1.42]	1.56 (0.91) [1.73]*
	Lowest	0.86 (0.81) [1.05]	1.15 (0.65) [1.78]*	1.62 (1.21) [1.33]	1.06 (0.88) [1.20]
	$p < 0.05$ (%)	0%	71%	0%	0%
	$p < 0.10$ (%)	7%	100%	0%	14%
Property rights	Highest	0.75 (0.18) [4.15] ***	0.61 (0.15) [4.20]***	1.24 (0.61) [2.04]**	0.99 (0.52) [1.89]*
	Base	0.75 (0.18) [4.15] ***	0.61 (0.15) [4.20]***	1.04 (0.61) [1.71]*	0.96 (0.52) [1.83]*
	Lowest	0.46 (0.19) [2.47]**	0.29 (0.16) [1.80]*	0.92 (0.59) [1.56]	0.65 (0.49) [1.33]
	$p < 0.05$ (%)	86%	79%	21%	0%
	$p < 0.10$ (%)	100%	100%	71%	50%
M-variables					
BNP, *t*-1	Highest	-7.25 (1.96) [3.70] ***	-5.33 (1.34) [3.96]***	-6.83 (2.11) [3.24]***	-5.11 (1.45) [3.53]***
	Lowest	-7.64 (1.96) [3.89] ***	-5.88 (1.45) [4.05]***	-7.53 (2.17) [3.47]***	-6.19 (1.60) [3.86]***
	$p < 0.05$ (%)	100%	100%	100%	100%
	$p < 0.10$ (%)	100%	100%	100%	100%
Investment ratio	Highest	0.15 (0.05) [3.09] ***	0.16 (0.04) [4.37] ***	0.16 (0.06) [2.91]***	0.17 (0.04) [4.57] ***
	Lowest	0.14 (0.06) [2.52]***	0.13 (0.03) [3.97]***	0.15 (0.06) [2.31]**	0.11 (0.04) [3.25] ***
	$p < 0.05$ (%)	93%	100%	50%	100%
	$p < 0.10$ (%)	100%	100%	100%	100%
Population growth	Highest	-0.74 (0.16) [4.52] ***	-0.79 (0.15) [5.35]***	-0.80 (0.15) [5.38]***	-0.84 (0.13) [-6.42]***
	Lowest	-0.77 (0.15) [4.93] ***	-0.86 (0.16) [5.32]***	-0.83 (0.20) [4.10]***	-0.95 (0.13) [-7.28]***
	$p < 0.05$ (%)	100%	100%	100%	100%
	$p < 0.10$ (%)	100%	100%	100%	100%
Education	Highest	0.05 (0.02) [2.99]***	0.03 (0.01) [2.20]**	0.06 (0.02) [3.45]***	0.04 (0.01) [3.14]***
	Lowest	0.02 (0.01) [1.62]	0.01 (0.01) [0.74]	0.03 (0.015) [1.81]*	0.01 (0.01) [0.85]
	$p < 0.05$ (%)	57%	0%	43%	29%
	$p < 0.10$ (%)	93%	43%	100%	50%
Z-variables					
Democracy, *t*-1	Highest	0.007 (0.01) [0.69]	0.004 (0.008) [0.47]	-	-
	Lowest	0.0008 (0.009) [0.08]	0.001 (0.008) [0.12]	-	-
	$p < 0.05$ (%)	0%	0%	-	-
	$p < 0.10$ (%)	0%	0%	-	-
Δ Democracy, *t*-1	Highest	-	-	0.002 (0.01) [0.13]	-0.01 (0.01) [1.24]
	Lowest	-	-	-0.005 (0.01) [0.34]	-0.02 (0.01) [2.06]**
	$p < 0.05$ (%)	-	-	0%	29%
	$p < 0.10$ (%)	-	-	0%	57%
Trade	Highest	0.03 (0.01) [2.60]***	0.03 (0.009) [3.36]***	0.03 (0.01) [3.12]***	0.04 (0.008) [4.80]***
	Lowest	0.02 (0.01) [1.57]	0.03 (0.01) [2.78]***	0.03 (0.015) [1.97]**	0.04 (0.01) [3.65]***
	$p < 0.05$ (%)	29%	100%	71%	100%
	$p < 0.10$ (%)	71%	100%	100%	100%
Inflation (log)	$p < 0.05$ (%)	100%	100%	100%	100%
	$p < 0.10$ (%)	100%	100%	100%	100%
Life expectancy	$p < 0.05$ (%)	0%	14%	29%	29%
	$p < 0.10$ (%)	50%	57%	86%	86%

Notes: B-coefficients and standard errors are rounded. () includes standard errors; [] includes t-values.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

The regressions of columns 1-2 are EBA-tests based in models 3-4 of Table 1. The regressions of columns 3-4 are EBA-tests based in models 7-8 of Table 1. Highest and lowest β–estimates are for the sake of brevity not given for the variables inflation and life expectancy. Results for lagged growth are included in all regressions but for the sake of brevity not included. All analyses are done using fixed effects and PCSEs, since these—unlike White standard errors—correct for both heteroscedasticity and contemporaneous cross-sectional correlation.

If we consider the results of the EBA-tests, where all observations are included (columns 1 and 3), then it is immediately obvious that the veto player variable does not stand the tests—neither for the extent of separation of powers nor for changes in this. In both cases the values of the lower bounds for the lowest estimates negative (β-1.64σ) and accordingly not "robust" as defined by Levine and Renelt (1992). However, this result is, as related to the level of separation of powers, to a large extent the product of the presence of relatively few, extreme observations.[25] It is thus clear from column 2 that the veto player variable is a robust variable, if the EBA-regressions are made with the exclusion of outliers. In that case the coefficients for the configuration of veto players are positive at the same time as the lower bound is significant with $p < 0.10$. In other words, disregarding some few, extreme observations there is empirical evidence that higher levels of separation of power has a robust association with higher economic growth. As regards changes in the levels of separation of powers, the results do not change when outliers are excluded; however, it bears noting that this veto player variable at no time changes its sign, just as its z-values at no time fall below 1.

The results are clearer as concerns the importance of secure property rights. The coefficients for that variable are at no time negative, neither for the upper nor the lower limits (i.e., β-1.64$\sigma > 0$). This is also the case irrespective of whether or not outliers are included in the regressions (even if it is the case that the outliers seem to pull the estimates upwards). The property rights variable is thus, no matter how the regression models are specified, significant with $p < 0.10$ and in about 80 pct. of the observations it is significant with $p < 0.05$. Furthermore, the EBA-tests indicate that changes in the security of private property also has a robust effect on economic growth, although the variable only is significant at $p < 0.10$ in 71 pct. of the regressions (column 3), and the exclusion of outliers reduces this further to 50 pct. (column 4). However, in the remaining

[25] The number of outliers is approximately the same as in Table 1.

regressions the coefficients for private property protection at no point are negative, so the results hardly constitute sufficient evidence for a rejection of the suggestion that changes in private property protection have a positive effect on economic growth.

All the **M**-variables (GDP, investment ratio, population growth and secondary schooling) have robust associations with economic growth as well as the expected signs. These results correspond to a high degree with the results of Levine and Renelt using similar methods (Levine and Renelt 1992: 947). Furthermore, the level of inflation also has a significant, negative association with economic growth, while the extent of economic integration into the global economy has a positive association (cf. Frankel and Romer 1999).

The results relating to democracy fare much less well. The extent of democracy is highly insignificant and hence non-robust for the explanation of economic growth. In the EBA-tests of column 3, where the democracy variable is included with changes from year to year, it is even the case that the sign of the variable changes in the process, while the results of column 4, where outliers are excluded, suggest that changes in the direction of democratization may have a negative effect on economic growth. The general conclusion must be—especially considering the very small z-values of columns 1-3—that the extent of democracy does not have any particular importance for economic growth, when other relevant institutional factors are controlled for. This is a result that corresponds with the conclusions of several other, similar studies (e.g. Knack and Keefer 1995: 219-220; Leblang 1996: 17-18; Przeworski et al. 2000: 146-158). However, the non-significance of the extent of democracy also indicates a falsification of the often heard view that democracy is growth-retarding. It thereby suggests, as others have argued, that the democracy-autocracy distinction probably does not capture the relevant institutional differences for the explanation of the variation in economic growth rates (cf. Przeworski and Limongi 1993: 65).

A possible counter-suggestion could be that the insignificant nature of the democracy variable merely is caused by the veto player variable being an alternative expression of the degree of

democracy: Political systems with extensive separation of powers tend to be more democratic, just as regimes classifiable as autocracies almost by definition tend to have very few veto players. Nonetheless, theoretically as well as empirically it seems reasonable to distinguish between separation of powers (understood as the sharing of political decision competences between several veto players who can block decisions) on one hand and democracy (understood primarily as the population's participation in elections that are free and fair) on the other hand (cf., e.g., Dahl 1998: 35-40).

Furthermore, while high levels of democracy and a large number of veto players in practice may tend to go hand in hand, they are not necessarily the same (Henisz 2000; Stasavage 2002: 57; Tsebelis 2002: 67-68). The early years of the US republic was clearly one with a high degree of separation of powers, but certainly not a democracy by modern standards. Similarly, the type of parliamentary democracy idealized in many North European states may score relatively high on democracy but not necessarily so on separation of powers. So, while the two concepts in practice may overlap, it should be clear that the veto player variable is not just another measure of democracy (cf. Riker 1982; Zakaria 2003).[26] In fact, when combined with the results regarding veto players, this suggests that the widespread attribution of positive effects of democracy upon economic growth in reality may be the result of a spurious relationship, where the underlying reality is that it is the separation of powers often found in liberal-democracies that create the environments that are positive rather than democracy itself.

[26] There are also important methodological differences in the construction of the indices measuring democracy and the configuration of veto players. Tests for multicolinearity also confirm that the simultaneous inclusion of the two measures is unproblematic, even if they tend to have a positive correlation: The binary correlation between the number of veto players and the extent of political rights has $r = 0.77$, while the correlation between the former and the extent of civil liberties is $r = 0.73$.

5. Conclusion

The purpose of the present study has been to analyze the possible relationship between political institutions and economic growth, and to do so theoretically and empirically with special attention to the importance of private property rights and the configuration of veto players in a political system.

The empirical analyses have been undertaken with a particular concern for two potentially serious problems in empirical growth regressions: The question of the robustness of the empirical relationships and the importance of extreme observations. Doing so, the statistical analyses have demonstrated that the extent of security of private property has a positive, significant and robust association with economic growth, and that something similar probably also is the case with regard to reforms increasing the protection of private property. The analyses also indicate that the extent of separation of power in a political system in general is positively associated with economic growth, although it is also the case that the presence of relatively few, extreme observations affect the results when EBA-tests are conducted: If all observations are included in the regressions, the configuration of veto players may be said to have a positive but non-robust association with economic growth, while the exclusion of outliers makes the relationship robust. A further finding is that the extent of democracy does not in itself seem to have any particular importance for economic growth. This means that separation of powers has a larger and more robust association with economic growth than democracy per se.

The over-all conclusion must be that there is much empirical value to the presumptions made by the constitutional thinkers of the enlightenment: A limited government that is able to effectively secure the property of the citizens and which simultaneously is constrained in such a way that it is difficult for one group to control all branches of government is a type of constitution that will tend to promote the general welfare. In particular, the importance of secure private property seems to be very high: In countries where private

property is not secure, the incentives for engaging in economically productive activities and investments are poor, just as the politically generated uncertainty facing both investors and produces increase. This leads ultimately to lower growth rates and contributes to trapping many countries and countless millions in poverty.

The results do, however, also raise a number of important questions. First of all, it is noteworthy that a formal separation of powers seems to be neither necessary nor sufficient for achieving high economic growth—something which is evident from the experiences of, e.g., South Korea, Taiwan, Singapore and China (Campos and Root 1996; Rodrik 1997; Rodrik 2005). Secondly, the present analysis does not in itself explain why some political regimes with more concentrated political power nonetheless seem to succeed at generating economic growth. It is also quite obvious that the effect of separation of powers upon economic growth must be quite indirect and work through, e.g., the security of property rights and the environment for investments (cf. Leblang 1996), but the exact nature of such relationships are not clear. These questions can however not be investigated here and must remain for future research.

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Appendix A.

Table 3: Summary statistics.

Variable	Obs.	Min	Max	Mean	Std. dev.	Source
Growth	2,800	-54.32	57.49	1.19	6.59	PWT, mark 6.1. (Heston, Summers and Aten 2002).
(Log) checks	3,209	0.004	1.26	0.30	0.29	World Bank 2002a.
Property rights	2,298	1.7	9.6	5.46	1.84	Economic Freedom of the World (Gwartney, Lawson and Emerick 2003).
(ln) GDP per cap.	2,849	5.64	10.69	8.35	1.08	PWT, mark 6.1. (Heston, Summers and Aten 2002).
Investment	2,849	0.96	72.41	15.01	8.32	PWT, mark 6.1. (Heston, Summers and Aten 2002).
Population growth	2,804	-19.08	16.01	1.71	1.37	PWT, mark 6.1. (Heston, Summers and Aten 2002).
Secondary schooling	3,254	2.70	161.04	57.07	33.58	World Bank 2002b.
(Log) inflation +2	2,911	-2.05	4.07	1.07	0.56	World Bank 2002b.
Trade	2,857	6.32	439.02	77.10	49.65	PWT, mark 6.1. (Heston, Summers and Aten 2002).
Life exp.	3,956	34.22	80.72	64.07	10.80	World Bank 2002b.
Democracy (political rights)	3,601	0	100	52.54	37.59	Freedom House (2004)

Appendix B.

Table 4: Replications of Table 2 without investment variable: Sensitivity tests for institutional effects on economic growth using EBA, panel analyses 1980-2000.

Model		(1) (*level*)	(2) (*level*)	(3) (Δ)	(4) (Δ)
Outliers?		Yes	No	Yes	No
I-variables					
Veto players	Highest	1.32 (0.78) [1.69]*	1.77 (0.60) [2.96]***	1.71 (1.22) [1.40]	1.46 (0.91) [1.61]
(ln *Checks*),	Basis	1.16 (0.79) [1.47]	1.77 (0.60) [2.96]***	1.51 (1.19) [1.27]	1.45 (0.91) [1.59]
t-1	Lowest	0.85 (0.83) [1.03]	1.20 (0.62) [1.94]*	1.45 (1.21) [1.20]	1.34 (0.94) [1.43]
	$p<0.05$ (%)	0%	79%	0%	0%
	$p<0.10$ (%)	7%	100%	0%	0%
Property	Highest	0.83 (0.18) [4.69]***	0.66 (0.16) [4.24]***	1.29 (0.62) [2.06]**	0.99 (0.54) [1.83]*
rights	Basis	0.83 (0.18) [4.69]***	0.66 (0.16) [4.24]***	1.04 (0.62) [1.68]*	0.96 (0.54) [1.78]*
	Lowest	0.53 (0.19) [2.83]***	0.34 (0.15) [2.24]**	0.90 (0.59) [1.53]	0.79 (0.46) [1.71]*
	$p<0.05$ (%)	100%	100%	21%	0%
	$p<0.10$ (%)	100%	100%	71%	100%

Notes: Regressions are replications of EBAs in Table 2 but without the investment variable. Results shown for institutional variables only.
See notes for tables 1-2.