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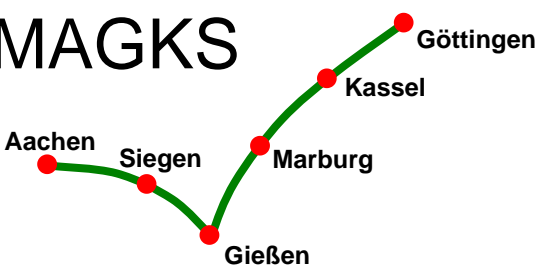
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The Economic Effects of Federalism and Decentralization – A Cross-Country Assessment¹

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and

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Abstract:

This paper is based on the conjecture that institutional details matter and that attempts to estimate the economic effects of federalism by drawing on a simple dummy variable neglect potentially important institutional details. Based on a principal component analysis, seven aspects of both federalism and decentralization are used as variables for explaining differences in (1) fiscal policy, (2) government effectiveness, (3) economic productivity, and (4) happiness. The results show that institutional details do, indeed, matter. Different aspects of federalism impact on the outcome variables in different degrees. This study adds to our knowledge on the transmission mechanisms of federalism and decentralization.

JEL classification: H 71, H11.

Key Words: Federalism, decentralization, Fiscal federalism, Economic Effects of constitutions, constitutional economics.

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The Economic Effects of Federalism and Decentralization

1 Introduction

Currently, some two dozen federally structured states exist implying that out of some 200 sovereign states, every eighth state has a federal structure. Yet, some 40% of the world population (i.e., around two billion people) live in federal states. Moreover, there seems to be a trend towards decentralizing ever more government functions. Even “paradigmatically unitary states” like the UK or France are decentralizing or “devolutionizing”. Enough reason to look at the economic effects of federalism and decentralization.

In a companion paper, Blume and Voigt (2008) derive seven different aspects of federalism and decentralization by drawing on principal components: (1) token executive elections, (2) sub-national expenditure, (3) fiscal independence, (4) sub-national democracy, (5) federal veto, (6) federal competence and (7) composition of parliament. Empirically, these aspects can be found in various combinations implying that federally constituted states can be highly centralized and states constituted in a unitary fashion can be highly decentralized (e.g. in terms of subnational expenditure). Based on these insights, we hypothesize that a cross country analysis interested in the economic effects of federalism and decentralization should not rely solely on federalism dummies as some empirical studies in the past have done as potentially crucial institutional details are not explicitly taken into account.

In this paper, we ask whether the different independent aspects of federalism and decentralization identified in the companion paper have effects on (i) fiscal policy, (ii) government effectiveness, (iii) economic productivity, and (iv) happiness. We run regression analysis for a cross section of up to 80 countries. Drawing on a federalism dummy often leads to results that are very different from those reached have by drawing on the seven aspects. In some cases, both the dummy and some of the seven aspects turn out to be significant. In these cases, use of the more detailed variables allows more detailed statements regarding the underlying causes provoking the effects. In other cases, the dummy does not show up as significant but one or two of the more precise variables do which is even more valuable as an additional insight.

Three aspects seem to have strong effects on economic variables: electing municipal governments locally, endowing federal units to veto at least some federal-level legislation, and the fractionalization of parliament in terms of the

heterogeneity of interests represented there. Interestingly, these three dimensions display problematic effects both on fiscal policy variables (they are connected with higher budget deficits and spending on social and welfare services) and government efficiency (being connected with lower levels of government efficiency and higher levels of corruption). Yet, both labor and total factor productivity are significantly higher in federally constituted states.

The rest of the paper is organized as follows: Section 2 develops our hypotheses. Section 3 presents an overview over the empirical evidence on the effects of federalism and decentralization. Section 4 shortly reviews the results of our companion paper. Section 5 contains the description of the regression analysis and possible interpretations of the results. Section 6 concludes.

2 Some Theory

One of the foremost students of federalism, William Riker, was very critical regarding its economic consequences. Riker (1975, 131) argues that, due to the large variety in the organization of federal states, a theory about the operation of federalism was “probably impossible”. He is quite explicit in his doubts concerning the relevance of this particular constitutional feature (1975, 155): “Nothing happens in a federation because of the federal constitutional arrangements that could not happen otherwise in fundamentally the same way.” Over the last number of years, some scholars have begged to differ and to ascertain outcomes that emerge precisely because a state is constituted along federal lines.

The conjecture that federalism could have relevant economic consequences can draw on a number of theoretical traditions: Relying on Hayek (1939), one branch of the literature argues that more information on the functioning of government techniques is produced when constituent governments simultaneously try out various solutions. Another branch, going back to Tiebout (1956) and re-enforcing the information argument, claims that competition by constituent governments for mobile citizens gives constituent governments incentives to provide their populations with a bundle of collective goods that reflects their preferences at a competitive price. These two branches both deal with aspects of horizontal competition between various government units. Another literature (Olson 1969, Oates 1972) deals with vertical competition, i.e. the relationship between the federal and the state level (and in particular potential externalities). Closely related is the literature that deals with common pool and (or) moral hazard problems of federalism, in particular the difficulty of the federal level to credibly

commit not to bail out single constituent states. Better information and (or) more adequate government incentives are conjectured to have far-reaching effects on government spending, the quality of governance and, at the end of the day, on income and growth.

With regard to possible effects that federalism and decentralization could have on our four groups of dependent variables, namely fiscal policy, government effectiveness, overall productivity and happiness, arguments often point in different directions such that the expected sign of the coefficient is unclear *ex ante*. The empirical tests become all the more important. The benefits of federal structures are expected to originate from the competition between constituent governments (i.e. from non-cooperation) whereas the costs are due to the necessity to cooperate on some issues (i.e. from cooperation).

Possible Effects on Fiscal Policies

Hayek (1939) has argued that competition between governments would reveal information on efficient ways to provide public goods. Assuming that governments have incentives to make use of that information, this can be translated into two hypotheses with regard to fiscal policies, namely hypothesis #1a: *C.p.*, federal states have lower expenditures (both central government and total government) than unitary states and the corresponding hypothesis #2a: *C.p.*, federal states have lower revenues than unitary states. This very idea has been picked up under various names more recently; yardstick-competition is one of them (see, e.g., Salmon 1987 or Besley and Case 1995).²

The argument first published by Tiebout (1956) is a little more complicated: In his model, the lower government levels compete for tax paying citizens which would give the lower governments incentives to cater to their preferences. One could thus expect federally organized states to produce fiscal policies more in line with the preferences of the median voter on the local or state level. Whether this automatically translates into lower taxes, lower budgets and lower deficits is a different question because such an argument implicitly assumes that the median voter would always wish taxes, budgets and deficits to be low.

² In this section, many competing hypotheses concerning the effects of federalism will be presented. The hypotheses presented by supporters of federalism are denoted with an “a” whereas those of the critics are denoted with a “b” after the number.

Unequivocal predictions concerning the direct effect of a federal structure on revenues, expenditures, and debts are, hence, impossible. On the other hand, a rather indirect effect should be the consequence of Tiebout: if (fiscal) policies are more in line with citizen preferences in federal than in unitary states, then the legitimacy of federations should be higher, *c.p.*. This should result in lower monitoring costs for tax compliance which should, in turn, imply that deficits are lower both due to a lower degree of tax evasion and less resources spent on monitoring tax payers. Hypothesis #3 thus reads: *C.p.*, federal states should enjoy higher levels of legitimacy than unitary states.

Until now, we have focused on the possible benefits of a federal constitution. We now move on to its possible costs. The multi-centered, i.e. federal, provision of public goods could imply that the overall number of bureaucrats is higher than in unitary states. Everything else equal, this would translate into higher expenditures / deficits in federal states. Additionally, some cooperation between the central government and the constituent governments is required. Resources need to be put into coordinating various activities. What is more, if both levels of governments pretend to have the final decision-maker power in some policy areas, conflict about the interpretation of these policy areas appears likely. Working to resolve these conflicts will also eat up some resources.³ All of these considerations would make us predict that expenditures should be higher in federally constituted states than in unitary ones (hypothesis #1b) and, correspondingly, that revenues and (or) deficits should also be higher there (hypothesis #2b).

The constitutions of federally organized states are difficult to change. This means that the number of states, their borders, but also their competences etc. will be rather stable. This can also entail costs: re-allocating tasks presupposes the consent of those who will not be in charge anymore. Their consent seems unlikely (unless some [possibly efficiency-reducing] compensation is offered). In other words: the rigidities inherent in federalism prevent an efficient (re-)allocation of tasks. Even if the current number and size of states is optimal for the provision of one public good, it is unlikely that it will be optimal for the provision of all public goods. Given that the existing number of states is too high, economies of scale cannot be realized. Tanzi (2000), e.g., suspects that those providing public goods will be insufficiently specialized. These considerations tend to re-enforce hypotheses #1b and 2b.

³ Riker (1975, 144) has put this succinctly: “Lawyers, especially constitutional lawyers have a little more work in a federation than in a unitary system: otherwise there is not much difference.”

It can be argued that government deficits are simply the difference between revenues and expenditures and that there would, hence, be no need to explicitly deal with deficits in addition. This evaluation might be premature if incentives to incur debts differ systematically between federal and unitary states. Given that lower level government units in unitary states do not have the competence to incur deficits autonomously but that this is the case in federal states, federal states need to deal with a moral hazard problem that is not an issue in unitary states.⁴ The federal government will regularly issue “no bail-out clauses” but they will not always be credible.⁵ In case they are not, constituent governments have incentives to incur deficits connected with the expectation to be bailed out should they be incapable of repaying their loans. Assuming that a “perfect” solution to this moral hazard problem is rather unlikely, the following hypothesis # 4 seems reasonable: *C.p.*, aggregate government deficit will be higher in federal than in unitary states.

A number of factors might, however, play in to mitigate the problem: if there are strong, disciplined parties that are active throughout most of the federation and one party is in charge of the federal as well as most of the constituent governments, then party leaders might prevent the state officials from externalizing the negative effects of over-borrowing (Rodden and Wibbels 2002). Notice that this mitigating effect is composed of institutional as well as non-institutional aspects: the structure of the party system is a consequence of the heterogeneity of the country as well as its electoral institutions whereas the dissimilitude of federal and constituent governments is the decision of the voters. On a second aspect, namely the relevance of the number as well as the symmetry of constituent governments for subnational debts, there are competing hypotheses again: scholars emphasizing competition between constituent governments argue that a high number of similarly sized states would reduce the danger of non-competitive cartels. With regard to the issue of over-borrowing, Wildasin (1997) argues that large states could become “too big to fail”. In other words: a large number of small states would let the federal government’s no bail-out promise appear more credible because the costs of letting a small state go bust are less than the costs of letting a large state go bust. On the other hand, it has been argued (Rodden and Wibbels 2002) that large member states can internalize more of the

⁴ The relationship between the central government and the lower units in unitary states might be more aptly described drawing on principal agent theory with its familiar monitoring problems. For such a view, see Seabright 1996.

⁵ Rodden (2002, 672) points out that the creditworthiness of the federal level might be jeopardized if it does not bail out the constituent governments.

benefits generated by responsible fiscal policies. Similar arguments can be made with regard to the number of constituent governments: if the implementation of a responsible fiscal policy depends on the ability of the various governments to coordinate their behavior, the likelihood of successful coordination appears higher in small number than in large number settings.

Further, the assumption that federal states have at their disposition borrowing autonomy and local governments of unitary states do not is most likely empirically false. Constituent governments have various degrees of borrowing autonomy at their disposition and a mitigating factor to hypothesis #4 could hence exist, if the borrowing autonomy of member states is seriously constrained (Rodden 2002). Finally, a no bail-out clause might be more credible if the federal government is itself subject to hard budget constraints. If monetary policy decisions are taken and implemented by a factually independent central bank, this might mitigate the problem of constituent government borrowing.

A last, possibly mitigating, factor focuses on an institutional detail of many federations: their constituent governments are often represented in an upper chamber in which sparsely populated regions are often overrepresented (Samuels and Snyder 2001). If these areas are mainly populated by fiscally conservative farmers, this could lead to lower fiscal deficits (Rodden 2004). An empirical test of hypothesis #4 should, hence, explicitly control for these potentially mitigating factors.

Over the last couple of years, there have been intensive debates whether the competition within federations would lead to a “race to the bottom” or, conversely, a “race to the top” (Wildasin 2008 is a concise survey of the pertinent literature on fiscal competition). The race to the bottom is expected with regard to norms and standards but also with regard to social and welfare programs. Given that competition with regard to social and welfare spending is at all possible, proponents of the race to the bottom view believe in the following hypothesis #5a: *C.p.*, federations are expected to spend less on social and welfare programs than unitary states. Those arguing in favor of a race to the top might be arguing the exact opposite, hence hypothesis #5b: *C.p.*, federations are expected to spend more on social and welfare spending than unitary states.

Summing up the expected effects of federalism on fiscal policies as clearly unclear is not to exaggerate. Empirical tests are, hence, crucial.

Possible Effects on Government Effectiveness

We move on to deal with possible effects of federal constitutions on a number of governance indicators. Over the years, dozens of governance indicators have been discussed so we need to constrain ourselves. Following Persson and Tabellini (2003), government effectiveness will be proxied for by the indicator of the same name that is part of the Governance Indicators published by the World Bank (Kaufmann et al. 2005). It combines perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies. Secondly, their variable "graft" will be used which is supposed to reflect the level of corruption encountered in various societies. We thus need to deal with possible effects of federal/unitary constitutions on government effectiveness and corruption.

Among other factors, government effectiveness will depend on the quality of the bureaucrats running the administration. It could now be that government jobs in provincial state capitals are not attractive for highly qualified personnel who prefer a job in the private sector but who would be ready to enter the government sector were they offered a job in a glamorous capital. Formulated as hypothesis #6b: government effectiveness is expected to be lower in federal than in unitary states.

One aspect of government effectiveness is its capacity to credibly commit to its own promises. The number of veto players, i.e. those players who have the capacity to veto a new policy, is regularly higher in federal than in unitary states. This means that the consent of more players is needed if the government wants to renege from its own promises which implies that the capacity of federal governments to credibly commit to their own promises is higher than that of governments of unitary states. Regarding this aspect of government effectiveness, federations are, hence, expected to have advantages over unitary governments (hypothesis #6a).

Resources spent on rent seeking cannot be allocated into more productive venues and constitute, hence, social waste. The question, then, is whether the amount of resources spent on rent seeking will be higher under federal or under unitary constitutions. Again, we encounter competing predictions: if one assumes that the resources spent on rent seeking are a function of the expected (change of) utility, less resources should be spent under federal constitutions because more actors need to be convinced (the number of veto players argument again). Yet, the time-dimension might have a countervailing effect: since the existence of the

constituent states is constitutionally guaranteed under federal constitutions but the existence of sub-national governments is not guaranteed under unitary constitutions, rent seeking investments under federations might pay off over a higher number of periods and appear, hence, more attractive.

Moving onto the question whether corruption levels will be higher under federal or unitary constitutions, there is one standard answer: constituent governments will be closer to the people, will be playing infinitely repeated games with local constituents – and will, hence, be subject to local capture (see, e.g., Tanzi 2000). Formulated as hypothesis # 7b: Corruption levels will be higher under federal than under unitary constitutions. Shleifer and Vishny (1993) have introduced the concept of “efficient corruption”, implying that paying a sum once is sufficient to get the favor paid for. “Inefficient corruption” is thus corruption where more than one actor needs to be paid because there is a multitude of actors with some decision-making competence. Following this concept would re-enforce hypothesis #7b.

The standard argument against the local capture hypothesis seems to be that the behavior of constituent governments is more transparent in federations and politicians are, hence, more accountable for their actions. This would imply that corruption is lower under federal constitutions (hypothesis #7a). Additionally, corruption can also be interpreted as a sign for the inadequacy of the relevant rule-system; under dysfunctional rules, even welfare-enhancing activities will often require corrupt behavior. Following this assumption could lead to the following argument: since the constituent units of federal states are closer to the people, it is likely that their rules will be more adequate than under unitary states. State governments under federal constitutions can be conceptualized as principals, whereas state governments under unitary constitutions as agents of the national government. If one believes that principals are less prone to become corrupt than agents, this would be another aspect in favor of hypothesis # 7a.

Regarding the expected effects of federalism on governance indicators, the expected net effects are, again, unclear.

Possible Effects on Productivity

This is also true for the expected effects of federalism on productivity levels. The argument that the higher number of veto players gives federations an advantage over unitary states in terms of commitment capacity has already been made in the last subsection. The higher commitment capacity might also be relevant here. It might increase total factor productivity directly. This is closely related with

another effect also expected from systems with a high number of veto players: policy swings will be less pronounced as a consequence of changes in the national government. A steady path of government policies allows private actors to form expectations over a longer period of time which might, in turn, increase overall productivity. Formulated as hypothesis # 8a: *c.p.*, federal constitutions should be correlated with higher levels of productivity than unitary constitutions. But again, this hypothesis can be turned around: if exogenous shocks make swift reactions necessary, it appears plausible that federally structured states have more problems to react adequately to such shocks than unitary governments.

The higher number of veto players in federal states is further conjectured to have an indirect effect via making other institutions stronger. The factual independence of central banks, e.g., is always in danger. If the consent of more actors is needed to tinker with central bank independence, this is less likely to happen. The higher factual central bank independence can itself have positive effects on the credibility of non bail-out promises as already discussed above. If federations are more likely to enjoy factually independent central banks, then inflation rates are likely to be lower, which would, again, be conducive to productivity.

Further, the existence of a number of power centers always entails the possibility of power struggles and instability. This might have exactly the opposite effect and hypothesis # 8b thus reads that *c.p.* federal constitutions should be correlated with lower levels of productivity than unitary states.

In our considerations on the possible effects of federations on fiscal policies, it is conjectured that federations might enjoy higher levels of legitimacy which might lead to lower deficits. This argument can be extended to productivity: if the (local) public goods provided in federations are closer to the preferences of their citizens, then this can also be interpreted as being tailored more according to the needs of the regional populations which should, in turn, be reflected in higher levels of total factor productivity.

Beyond purely economic variables

Public goods provided in federally organized states are conjectured to be more in line with citizen preferences than in unitary states. But this is not sufficient to come up with unambiguous predictions regarding the effects of federal structures on fiscal policies because the preference of the median member of society might not be identical over all societies. But if citizen preferences are, on average, taken more seriously in federations than in unitary states, this ought to be reflected in the general satisfaction of the citizens with their state. The corresponding

hypothesis #9 reads: *C.p.*, citizens of federal states are expected to express higher levels of general satisfaction with their lives than citizens of unitary states.

3 Review over the Empirical Results

In their book-length study on the economic effects of constitutions, Persson and Tabellini (2003) analyze the effects of constitutional institutions on a number of variables, including (1) fiscal policy (in particular the size of the government, the composition of government spending, and the size of the budget deficit); (2) rent extraction by the government (in particular the perceived corruption of government and the effectiveness with which government provides public goods and services); and (3) composite measures of growth-promoting policies such as the protection of private property rights that should then be reflected in labor as well as total factor productivity.

Persson and Tabellini did control for the effects of federally constituted states by relying on a federalism dummy. They report that the variable was insignificant for explaining differences in rent extraction (2003, 61) but significant for explaining differences in both labor and total factor productivity with federal systems doing better than unitary ones (2003, 71).

More specific evidence concerning the effects of federalism on total government spending includes Rodden (2003) who shows that in countries in which local and state governments have the competence to set the tax base, total government expenditure is lower for a cross-country study covering the period from 1980 to 1993. Feld, Kirchgässner and Schaltegger (2003) find that more intense tax competition, induced by a federal structure, leads to lower public revenue – at least with regard to Swiss cantons.

Regarding the effects of federalism on governance indicators (Persson and Tabellini's second group of dependent variables), results seem to be more ambiguous than ever. Treisman (2000) finds that federal states have, *c.p.*, higher corruption levels than unitary states. Fisman and Gatti (2002), on the other hand, find that fiscal decentralization is strongly and significantly associated with lower corruption levels. These results only seem contradictory: Treisman relies on a dummy variable for federal states whereas Fisman and Gatti really deal with fiscal decentralization which they proxy for by the share of subnational spending over total government spending. It obviously matters a great deal whether one is interested in the effects of federalism or the effects of decentralized provision of public goods. A number of more recent papers have emphasized that decentralization can have various dimensions: Gerring et al. (2006) find that

unitarism and various governance measures are strongly – and positively – correlated. They do not only find significant statistical but also significant substantive correlation with the absence of corruption, bureaucratic quality, the number of phone lines, more trade openness, and fewer infant deaths as well as higher literacy rates. Dreher (2006) finds that higher subnational revenue, expenditure and employment is correlated with better values in governance indicators proxied for the rule of law, law and order, time to start a business as well as judicial independence. Freille (2006) comes up with the intriguing finding that both fiscal decentralization and constitutional centralization (i.e. unitarism) are simultaneously associated with lower corruption. Drawing on more data that has become available in the meantime, Treisman (2007, 235) now finds that the correlation between perceived corruption and federal structure is not robust at all.

The available evidence concerning the effects of federalism (or decentralization) on income and growth is just as ambiguous. There are only half a dozen studies with cross-country evidence. Often, these studies are limited to OECD members. With a cross-section of 91 countries, Enikopolov and Zhuravskaya (2003) is an exception. They find that higher decentralization of revenue is correlated with lower real GDP per capita growth rates in developing countries. Davoodi and Zou (1998) report similar results based on decentralization of spending in 46 countries. Thießen (2003a, 2003b) finds the opposite for a cross-section of 21 developed countries and a panel of 26 countries. Feld et al. (2004) survey the literature in more detail including empirical results for individual countries. The results of these studies are just as ambiguous as those mentioned here. We argue that the ambiguity is not only due to the insufficient distinction between federalism and decentralization, but also to the very coarse measures that have been used for delineating federations.

4 Seven independent Aspects of Federalism and Decentralization

In order to test the hypotheses developed in section 2 of the paper, we need indicators for federalism and decentralization. In our companion paper (Blume/Voigt 2008), we reject the idea of having “the” single all encompassing indicator of federalism. Federal states are a very heterogeneous bunch and many – possibly important – differences would not be properly taken into account if we tried to compress all differences into one single dimension. Whereas the term federalism refers to a constitutional decision, the factually realized degree of (fiscal, political or administrative) decentralization is a consequence of policy choices made on the post-constitutional level. The degree of decentralization can thus be largely independent from the constitutional choice. We therefore work

with a number of different indicators focusing on different aspects of federalism and decentralization as this might permit us to tackle down the specific institutional arrangements that are responsible for differences in outcomes (if there are any).

To answer the question whether this conception is reflected in the data, the companion paper runs factor analysis drawing on 25 indicators that have been used as variables for both federalism and decentralization. We find significantly more than two latent constructs indicating that the distinction between federalism and decentralization might still be too coarse. Seven aspects of federalism and decentralization can be separated from each other. These seven aspects represent some 70 percent of the variation in the 25 original variables:

- (1) The first aspect merges the elements of democracy on the subnational levels (namely whether local and regional governments are elected) with the competence of the center to override decisions of the lower government tiers. We propose to call this aspect token executive elections. It is best represented by the original variable LOCEXE provided by Kearney (1999) which indicates whether local executives (but not legislatures) are directly or indirectly elected.
- (2) The second aspect is primarily composed of the sub-national share of total expenditure and the sub-national revenues out of own resources. This covers one important aspect of fiscal decentralization. We propose to call it sub-national expenditure. It is best represented by the original variable DECEXP from the IMF's Government Finance Statistics Yearbooks, which reflects the sub-national share of total expenditure.
- (3) The third aspect centers on vertical transfers and we propose to call it fiscal independence. It is best represented by the original variable TRANSFER from the IMF's Government Finance Statistics Yearbooks, which is a proxy for vertical imbalance reflecting the transfers to sub-national governments as a share of sub-national government expenditures.
- (4) The fourth aspect primarily deals with democratic elections on the sub-national levels; it also includes a variable on the age of parties, thus reflecting sub-national democracy. It is best represented by the original variable MUNI from the Database of Political Institutions provided by the World Bank (Beck et al. 2000), which documents whether municipal legislatures and governments are locally elected.
- (5) Aspect five is driven by two constitutional variables, namely the competence of the subnational levels to veto national legislation or to veto national legislation regarding finance issues. We propose to call it federal

veto. It is best represented by the original variable SUBVETO constructed by Treisman (2002), which deals with the competence of the constituent units to block (certain kinds of non-financial) legislation.

- (6) The next aspect also deals with some core aspects of federalism, namely the question whether the states have some residual autonomy. But in addition, it also reflects some important fiscal aspects that we would expect federations to have. We propose to call it federal competence. It is best represented by the original variable REVSHARE also produced by Kearney (1999), which represents the right of the lower government levels to a portion of the revenues transferred to them in a regular and unconditional fashion.
- (7) The seventh, and last aspect, deals with the composition of parliament. It thus deals, again, with an aspect of democracy, here not on the institutional level but rather on the policy level. It is best represented by the original variable GOVFRAC provided by Beck et al. (2000) and picked up by Enikolopov and Zhuravskaya (2006), which reflects the probability that two deputies picked at random from among the government parties will be of different parties. The lower this value, the stronger the governing party is supposed to be.

Summing up, the companion paper has identified seven independent components out of a data set of 25 variables usually used to measure federalism and decentralization, three of which deal more with democracy, (1, 4 and 7), two deal with fiscal decentralization issues (2 and 3) and only two (5 and 6) with federalism in a narrow sense. Table 1 provides descriptive statistics for the seven variables that will be used as proxies for the seven aspects identified with a factor analysis.

Table 1: Descriptive Statistics

Name	Description	N	Mean	Min	Max	SD
locexe	local elections executive	46	2.17	0.00	4.00	2.01
decexp	share of expenditures	85	22.15	0.37	65.39	16.87
transfer	share of transfers	91	34.56	0.16	98.12	26.33
muni	local elections	77	1.31	0.00	2.00	0.83
subveto	right to block legislation	133	0.33	0.00	2.00	0.66
revshare	autonomous revenues	46	2.00	0.00	4.00	1.26
govfrac	fractionalization of gov.	131	0.28	0.00	0.88	0.29

Table 2 shows the bivariate correlations of these seven variables. Although a number of correlations are significant, not a single correlation is larger than 0.4. This indicates that the seven variables reflect seven dimensions of both federalism

and decentralization that are largely independent from each other. Moreover, table 2 shows that the most frequently used federalism dummies reflect three of the seven dimensions in particular, namely fiscal decentralization, veto powers of subnational units in national legislation and revenue autonomy. The first of these three would conceptually rather belong to decentralization.

Table 2: Bivariate correlations of the seven aspects of federalism and decentralization as well as their correlations with federalism dummies

Name	locexe	decexp	transfer	muni	subveto	revshare	govfrac
locexe	1						
decexp	0.396* (34)	1					
transfer	0.247 (35)	0.138 (78)	1				
muni	0.356 (27)	0.217 (44)	0.034 (46)	1			
subveto	0.229 (46)	0.299** (85)	0.123 (90)	0.141 (73)	1		
revshare	0.209 (46)	0.384* (34)	-0.016 (35)	0.000 (27)	0.334* (46)	1	
govfrac	0.044 (45)	0.148 (81)	0.034 (86)	-0.027 (74)	0.031 (126)	0.169 (45)	1
federalism dummies [#]	0.284 (46)	0.360** (85)	0.059 (91)	0.129 (77)	0.421** (133)	0.386** (46)	0.132 (131)

‘**’ and ‘*’ show that the Bravais Pearson correlation is significant on the 1 or 5 percent level respectively. # Mode of the federalism-dummies used by Elazar (1995), Kearney (1999), Watts (1999), Derbyshire and Derbyshire (1999), the Forum of Federations (2002), and the CIA World Factbook (2006).

The main conclusion of this section is that indicators of federalism and decentralization should aim at keeping conceptually different dimensions such as revenue autonomy and constitutional veto powers apart. In the cross country analysis on economic effects in the next section, we therefore rely on the seven variables mentioned here as proxies for the seven aspects of federalism and decentralization in our companion paper.

5 Estimation Approach and Results

The estimation approach used is straightforward and follows directly from the theoretical part. We are interested in estimating the dependent variable Y that can stand for (i) various aspects of fiscal policy including the perceived legitimacy of the state, (ii) government effectiveness, (iii) economic productivity or (iv) reported levels of life satisfaction (“happiness”) of a country.

$$Y_i = \alpha_i + \beta M_i + \gamma FDI_i + \delta Z_i + u_i$$

The fiscal policy variables are mainly taken from the data set used by Persson and Tabellini (2003), i.e. central government expenditure as a percentage of GDP (CGEXP), central government revenue as a percentage of GDP (CGREV), central government surplus as a percentage of GDP (SPL), and central government expenditures consolidated on social services and welfare as a percentage of GDP (SSW). An additional variable, the total government expenditures as share of GDP (TOTEXP) is taken from Heston et al. (2002). CGEXP, CGREV, and TOTEXP are chosen with regard to hypotheses 1 and 2, SPL with regard to hypothesis 4 and SSW with regard to hypothesis 5. Another effect related to fiscal policy as well as to government efficiency is conjectured to be the consequence of the Tiebout vision of federal competition: if the public goods bundles provided by the different constituent governments are more closely reflecting the preferences of the respective citizens, the legitimacy that citizens attribute to federal states is predicted to be higher than that attributed to unitary states. As no direct indicators of legitimacy are readily available, we use the answer to a question contained in the World Values Survey dealing with the preparedness to cheat on taxes (“Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: Cheating on tax if you have the chance [% “never justified” code 1 from a ten-point scale where 1= never and 10 = always]). On the one hand, this variable (CHEATING) is a crude proxy for legitimacy. On the other, it serves our purposes well as the conjecture is that higher degrees of legitimacy should have positive effects on fiscal variables (less expenditure, fewer deficits) as well as on productivity. The relationship between the proxy and the fiscal variables ought to be straightforward. The variable CHEATING is chosen with regard to hypothesis 3.

The next endogenous variable on government efficiency (GOVEF) is taken from the Governance Indicators of the World Bank (Kaufmann 2005). It combines perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government’s commitment to policies into a single indicator on a scale between 0 and 10, where higher values signal higher effectiveness. We take the average values for 1996, 1998, 2000, 2002, and 2004. The variable GRAFT according to the Governance Indicators of the World Bank is focusing on perceptions of corruption. It has values between 0 and 10, where lower values signal higher effectiveness. An

alternative measure is the Corruption Perceptions Index (CPI) from Transparency International, measuring perceptions of abuse of power on a scale of 0-10 (lower values meaning lower levels of corruption). We take the average over the years 2000-2005. The variable GOVEF is chosen with regard to hypothesis 6 and the variables GRAFT and CPI with regard to hypothesis 7.

As productivity measures with regard to hypothesis 8, we use the natural logarithm of output per worker (LOGYL) for the year 2000 and the natural logarithm of total factor productivity (LOGA) calculated for the year 2000 on the basis of a Cobb-Douglas-Function following the model of Hall and Jones (1999). Beyond the impacts that federalism and decentralization have on fiscal policies, governance indicators and overall productivity, defenders of decentralization could argue that having one's government close would be a value per se, that it would be a good thing even if it did not have any productivity increasing effect (hypothesis 9). Therefore, we also look at cross country differences in "happiness" according to happiness surveys collected by Veenhoven 2004 and arranged on a 10-0-scale with higher values signaling higher happiness (HAPPINESS).

The vector M is made up of a number of standard variables conventionally used to explain the respective Y along the lines of Persson and Tabellini (2003).

FD is one of our seven aspects of federalism and decentralization. Since the seven aspects are based on independent (uncorrelated) components identified by a factor analysis the regression coefficients would not change significantly if all the variables were put into one regression. Differences only occur due to differences in the country sample (because the seven different indicators are available for different countries); we therefore abstain from showing a regression with all seven variables in one estimation. As a benchmark, we also show a regression with a dummy variable for federalism. This variable is the mode of the federalism-dummies used by Elazar (1995), Kearney (1999), Watts (1999), Derbyshire and Derbyshire (1999), the Forum of Federations (2002), and the CIA World Factbook (2006).

The cross section analysis is performed by the TSLS technique while inference is based on t-statistics computed on the basis of White heteroscedasticity consistent standard errors. Our selection of instruments is influenced by Panizza (1999). The paper identifies the determinants of fiscal centralization drawing on Tobit estimates and some 60 countries. Depending on the specification, per capita income, the geographical size of a country, its level of ethnolinguistic fractionalization and the realized degree of democracy proved to be significantly correlated with the degree of fiscal centralization. We therefore decided to use the

natural logarithm of real GDP per capita (LYP), the natural logarithm of total population in millions (LPOP), the index of ethnolinguistic fractionalization (AVELF), and the age of democracy (AGE).

The Z vector is composed of a number of control variables that can be geographical, historical, political, economic as well as institutional. In the theoretical section, it was pointed out that high expenditure levels could also be the consequence of preferences (of the median voter) in favor of costly public good bundles. It is, hence, necessary to control for voter preferences. Ideally, this could be done by controlling for the fiscal or ideological preferences of the electorate. Two measures were used here: the first one measures the degree of fiscal conservatism of the voters. The second one reflects ideological preferences of legislative and executive majorities. The first measure is taken from the World Values Survey. There are two variables, one aiming at the self-evaluation of the surveyed person, the other aiming at his or her normative ideal for the entire society.⁶ The second measure is taken from Whytock (2006) who coded political party affiliations of the executive and legislative branches according to the following scheme: -1 if both the executive branch and legislative branch are right-leaning ideologically, (with the negative sign implying lower expected government spending) and 1 if both the executive and the legislative branch are left-leaning (and 0 otherwise).

It further could be the case that federalism and decentralization only have substantial effects in combination with other constitutional institutions. Remember that Riker (1964, 1975) conjectures that there is a very close correlation between the party structure and the kind of federation in a given country [1975, 133: "... most writers identify the decentralization of parties as a correlate (or in some cases even a consequence) of the federal constitution."] We propose to turn this argument around here: electoral systems are probably the single most important determinant of the number of parties to be expected in a country. The number of parties is, of course, logically correlated with the degree of party fractionalization. This implies that the electoral system determines the kind of federalism to be expected in a country. *C.p.*, federal countries with

⁶ Here is the wording of the two questions: In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking? (Left Right 1-10); And now, could you please tell me which type of society your country should aim to be in the future. For each pair of statements, would you prefer being closer to the first or to the second alternative? A society with extensive social welfare, but high taxes. A society where taxes are low and individuals take responsibility for themselves (somewhat closer to, on a scale 1-5).

majority rule as an electoral system are expected to implement more centralized versions of federalism than countries relying on proportional representation. This entails the possibility that the electoral system displays an effect on economically relevant variables not only directly, but also indirectly via the kind of federalism it induces. This possibility is explicitly controlled for by including the variable MAJ in the Z-vector. Another intricate interdependence can also be derived from Riker (1975, 110). Federations need to produce a stable balance between the loyalty that their citizens feel to the constituent governments and to the central government. With regard to the U.S., Riker claims that the independence of the presidency was a crucial feature that permitted the development of a national orientation of loyalty. *C.p.*, federations coupled with presidential government forms will be more stable than federations coupled with parliamentary government. If, in turn, stability is conducive to higher productivity, then the form of government ought to be explicitly taken into account. This is done, by including the variable PRES in the Z-vector.

Vaubel (1996) finds that the age of the constitutional court (for the entire sample) or the independence of the constitutional court from the organs of central government (for the industrialized states) had mitigating effects on centralization. The degree of control that the lower level governments had over constitutional change and the existence of fiscal referenda also had negative effects on the degree of fiscal decentralization. Inspired by this study, we propose to add the following variables on top of the dummy for federalism when estimating the determinants of fiscal centralization: (1) the degree of judicial independence that the highest court of the country factually enjoys (DE_FACTO_JI), (2) the factual relevance of direct democracy (DDI) and (3) the number of years over which the country has had a unitary constitution without interruption (UNIHISTORY).

Finally, the Z-vector includes geographic controls (ASIAE, LAC, and SSA) and we also include legal origins (COMMLAW) as a control variable.

The results are summarized in table 3. A number of findings appear particularly noteworthy:

- (1) Institutional details clearly matter! The central motivation for running this study was our conjecture that a simple dummy variable for federalism would not do justice to the various dimensions connected with the term. Given that the dummy turns out as significant, our more precise estimates allow us to pin down which aspect of federalism drives the result. Even more interesting: with regard to the variables budget surplus (spl), expenditures and social services and welfare (ssw), cheating, government

effectiveness, graft and the Corruption Perceptions Index (cpi), the federalism dummy does not turn out to be significant while particular aspects of federalism are significant, some of them on a very high level of significance.

- (2) With regard to total government expenditure (column 1 of table 3), the federalism dummy has a positive sign and is significant on the 5 percent level. Having a look at the seven aspects here used to proxy for both federalism and decentralization allows us to identify REVSHARE (representing the unconditional right of the lower government levels to a portion of the government revenues) but also GOVFRAC (representing the fractionalization of parliament) as the two variables driving this result. The effect of REVSHARE on total government expenditure is economically substantial: a one standard deviation increase in REVSHARE is connected with an increase of 2 percent in total government expenditure whereas a one standard deviation increase in GOVFRAC is still connected with an increase in overall government spending of 1.3 percent. This can be interpreted as some evidence in support of hypotheses 1b and 2b.
- (3) The dummy variable indicates a positive correlation between federalism and output per worker as well as total factor productivity. Both effects can be ascribed to DECEXP (the sub-national share of expenditures). The higher it is the higher the two kinds of productivity. A one standard deviation increase of DECEXP is connected with an increase in output per worker of US \$ 1185. This variable is, hence, also econometrically significant which can be interpreted as evidence in favor of hypothesis 8a.
- (4) As already pointed out, the federalism dummy does not show any significant correlation with the budget surplus and the expenditures on social services and welfare. Drawing on the more fine-grained indicators, a different picture emerges: Both MUNI (indicating whether municipal governments are locally elected) and GOVFRAC are negatively correlated with the budget surplus, indicating that the presence of these institutional features leads to higher deficits. A one standard deviation increase in MUNI is connected with 2 point increase of the deficit as a share of GDP. GOVFRAC still has an effect of .8 points. This can be interpreted as evidence in favor of hypothesis 2b.
- (5) Similar results obtain when government efficiency is the dependent variable. In none of the four proxies chosen does the federalism dummy turn out as significant. Analyzing, alternatively, the seven aspects leads, again, to a different picture. This is particularly so for the two variables taken from the World Governance Indicators: High levels of MUNI are correlated with

lower levels of government effectiveness and higher corruption. SUBVETO (proxying for the competence of the constituent units to veto certain kinds of legislation) has similar effects. Similar results emerge when CHEATING is used as the dependent variable. The results can be interpreted as a corroboration of hypotheses 6b and 7b.

- (6) It seems noteworthy that of the seven aspects that are the result of the principal component analysis, only one is never significantly correlated with any of our outcome variables, namely LOCEXE. But taking into consideration that LOCEXE indicates the presence of token executive elections, this is in line with our priors.
- (7) For explaining variation in both fiscal policies as well as government effectiveness, only four of the seven aspects are ever significant. Focusing on these two groups of outcome variables, the effects of these four aspects would not be welcomed by many observers: they lead to higher total government expenditures, to higher budget deficits, to higher spending on social services and welfare, to lower government effectiveness and higher levels of corruption. It is all the more astonishing that both output per worker as well as total factor productivity are positively correlated with some of the aspects analyzed here. One possible transmission channel could be via happiness:
- (8) The correlation between our measure of happiness and the federalism dummy can be interpreted as empirical evidence in favor of hypothesis 9. Due to our approach, we are able to identify the specific institutional features provoking that result. A one standard deviation increase in DECEXP, TRANSFER and REVSHARE leads to fairly similar improvements in levels of reported life satisfaction (between 0.328 and 0.527 points). It could be speculated that the gains in happiness more than make up for the problematic results with regard to fiscal policies and government effectiveness. But this is only speculation.

6 Conclusion and Outlook

This paper is based on the assumption that federalism and decentralization are two different concepts that cannot only be kept apart theoretically but that are empirically combined in manifold ways: there are federally structured states that are decentralized but also federally structured states with a high degree of centralization. On the other hand, unitary states can also be highly decentralized. This paper draws on a precursor (Blume/Voigt 2008) in which the authors identify

seven aspects of federalism/decentralization by drawing on 25 frequently used indicators of both federalism and decentralization. Based on these seven aspects, the economic effects of federalism and decentralization are estimated in this paper.

The results show that institutional detail matters: drawing on a federalism dummy often leads to results that are very different from those reached by drawing on the seven aspects. In some cases, both the dummy and some of the seven aspects turn out to be significant. In these cases, use of the more detailed variables allows more detailed statements regarding the underlying causes provoking the effects. In other cases, the dummy does not show up as significant but one or two of the more precise variables do which is even more valuable as an additional insight.

Three aspects seem to have strong effects on economic variables: electing municipal governments locally, endowing federal units to veto at least some federal-level legislation, and the fractionalization of parliament in terms of the heterogeneity of interests represented there. Interestingly, these three dimensions display problematic effects both on fiscal policy variables (they are connected with higher budget deficits and spending on social and welfare services) and government efficiency (being connected with lower levels of government efficiency and higher levels of corruption). Yet, both labor and total factor productivity are significantly higher in federally constituted states. It is speculated whether this is caused via the higher levels of happiness reported in federal states.

These results should be interpreted cautiously: the number of available observations depends on the specific indicator which means that some of the differences could also be caused by differences in the sample (rather than the variable used). This calls for an extension in the number of available observations.

Methodologically, the impact of both federalism and decentralization could also be ascertained by drawing on instances where countries have changed their institutional set-up.

Thinking about possible policy implications of these findings, a new question arises: is it possible to set up institutions such that the advantages of federalism (decisions on local public goods reflecting the preferences of the local median voter to a higher degree) are preserved while its disadvantages are kept at bay?

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Table 3: Economic Effects of Federalism and Decentralization (TSLS-Regressions)

Selected independent variable	Dependent Variables											
	Fiscal Policy					Government Efficiency				Productivity/Happiness		
	totexp	cgexp	cgrev	spl	ssw	cheating	govef	graft	cpi	logyl	loga	happiness
Federalism-Dummy	2.71* R ² =0.48 n=79	-2.77 R ² =0.56 n=76	-3.80(*) R ² =0.55 n=73	-0.89 R ² =0.28 n=69	0.72 R ² =0.76 n=66	0.27 R ² =0.32 n=50	-0.36 R ² =0.84 n=79	0.35 R ² =0.85 n=79	0.35 R ² =0.83 n=79	0.39(*) R ² =0.58 n=80	0.27* R ² =0.45 n=80	0.41* R ² =0.19 n=58
LOCEXE	-0.70 R ² =0.61 n=37	-0.52 R ² =0.54 n=37	-0.30 R ² =0.45 n=37	0.51 R ² =0.20 n=36	0.37 R ² =0.62 n=31	-0.05 R ² =0.23 n=29	-0.01 R ² =0.78 n=37	0.06 R ² =0.82 n=37	0.11 R ² =0.82 n=37	0.07 R ² =0.53 n=35	0.04 R ² =0.40 n=35	0.03 R ² =0.31 n=32
DECEXP	0.08 R ² =0.52 n=63	-0.05 R ² =0.58 n=61	-0.04 R ² =0.59 n=60	0.02 R ² =0.14 n=57	0.03 R ² =0.69 n=54	-0.01 R ² =0.29 n=45	0.00 R ² =0.87 n=63	-0.00 R ² =0.86 n=63	-0.02 R ² =0.86 n=63	0.01* R ² =0.61 n=60	0.01* R ² =0.47 n=60	0.02* R ² =0.25 n=50
TRANSFER	0.09 R ² =0.52 n=63	-0.15(*) R ² =0.60 n=61	-0.13(*) R ² =0.61 n=60	0.02 R ² =0.14 n=57	0.04 R ² =0.69 n=54	0.00 R ² =0.25 n=45	0.00 R ² =0.87 n=63	-0.00 R ² =0.86 n=63	-0.02 R ² =0.86 n=63	0.01 R ² =0.58 n=60	0.00 R ² =0.44 n=60	0.02* R ² =0.23 n=50
MUNI	2.01 R ² =0.48 n=45	1.64 R ² =0.60 n=44	-0.52 R ² =0.53 n=42	-2.51** R ² =0.55 n=40	-0.49 R ² =0.77 n=37	-0.14 R ² =0.33 n=31	-0.87** R ² =0.85 n=45	0.82** R ² =0.88 n=45	0.58(*) R ² =0.88 n=45	-0.03 R ² =0.55 n=49	-0.09 R ² =0.35 n=49	-0.11 R ² =0.22 n=35
SUBVETO	0.74 R ² =0.46 n=77	-0.36 R ² =0.57 n=74	-0.07 R ² =0.61 n=71	0.39 R ² =0.30 n=68	0.73 R ² =0.76 n=64	0.26* R ² =0.38 n=50	-0.25(*) R ² =0.85 n=77	0.31** R ² =0.86 n=77	0.30* R ² =0.87 n=77	0.16 R ² =0.56 n=77	0.05 R ² =0.41 n=77	0.19 R ² =0.18 n=58
REVSHARE	1.59** R ² =0.65 n=37	-0.31 R ² =0.54 n=37	-0.44 R ² =0.45 n=37	0.13 R ² =0.11 n=36	0.58 R ² =0.62 n=31	-0.04 R ² =0.21 n=29	-0.09 R ² =0.78 n=37	0.05 R ² =0.80 n=37	-0.06 R ² =0.80 n=37	0.03 R ² =0.51 n=35	0.05 R ² =0.39 n=35	0.26* R ² =0.51 n=32
GOVFRAC	4.46(*) R ² =0.48 n=78	5.10(*) R ² =0.57 n=75	3.79 R ² =0.54 n=72	-2.81* R ² =0.34 n=68	4.19** R ² =0.79 n=65	0.76* R ² =0.39 n=49	-0.21 R ² =0.83 n=78	-0.10 R ² =0.84 n=78	-0.13 R ² =0.86 n=78	0.34 R ² =0.57 n=80	0.11 R ² =0.43 n=80	0.53(*) R ² =0.17 n=58

These regressions are a modification of Persson/Tabellini 2003, i.e. they regressions of group I (fiscal policy) all include the following controls, not shown in the table: LYP, GASTIL, AGE, TRADE, PROP65, PROP1564, OECD; the regressions of group II (government efficiency) all include LYP, GASTIL, AGE, TRADE, LPOP, EDUGER, AVELF, OECD, PROT80; the regressions of group III (productivity/happiness) all include LAT01, FRANKROM, ENGFRAC, EURFRAC. The instruments of the first stage regression are LPOP, LYP, AGE and AVELF. The first number in a cell is the White heteroscedasticity-consistent β -coefficient of the regression. ‘***’, ‘*’ or ‘(*)’ show that the estimated parameter is significantly different from zero on the 1, 5, or 10 percent level, respectively. R² is the adjusted R-squared of the regression and n the number of observations.

Appendix 2: Descriptions of the Variables

Many variables used in this paper are based on Persson and Tabellini (2003, PT) or Blume, Müller, Voigt, and Wolf (2008, BMVW).

AGE:

Age of democracy defined as $AGE = (2000 - DEM_AGE) / 200$, with values varying between 0 and 1, source: PT and BMVW.

AVELF:

Index of ethnolinguistic fractionalization, ranging from 0 (homogeneous) to 1 (strongly fractionalized) averaging five sources; sources: PT and BMVW.

ASIAE:

Regional dummy variable, equal to 1 if a country is in East Asia, 0 otherwise; source: CIA (2005).

CGEXP:

Central government expenditures as a percentage of GDP, constructed using the item Government Finance-Expenditures in the IFS, divided by GDP at current prices and multiplied by 100; sources: PT and BMVW.

CGREV:

Central government revenues as a percentage of GDP, constructed using the item Government Finance-Revenues in the IFS, divided by GDP at current prices and multiplied by 100; sources: PT and BMVW.

CHEATING:

The variable is based on a question of the World Values Survey ("Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: ... Cheating on tax if you have the chance [% "never justified" code 1 from a ten-point scale where 1= never and 10 = always]).

COMMLAW:

Dummy for common law legal origin, coded 1 if legal origin is common law, coded 0 if legal origin is any other.

CPI:

Corruption Perception Index measuring perceptions of abuse of power by public officials. Average over 2000 – 2005. Index values between 0 and 10, lower values meaning lower levels of corruption (recoded from the original version); source: Transparency International and Internet Center for Corruption Research (<http://www.icgg.org/>).

DDI:

Direct Democracy Index (DDI) as provided by Fiorino and Ricciuti (2007) drawing on various sources. The countries are classified as 1) radical democrat; 2) progressive; 3) cautious; 4) hesitant; 5) fearful; 6) beginner and, 7) authoritarian.

DECEXP:

Sub-National Share of Expenditures (% Total); source: IMF's Government Finance Statistics (GFS), 2002.

DE_FACTO_JI:

Factual independence of the judiciary; values between 0 and 1 with 1 signaling a high level of factual independence; source: Feld and Voigt (2003).

EDUGER:

Total enrollment in primary and secondary education as a percentage of the relevant age group in the country's population, based on values for 1998 and 1999; sources: PT and BMVW.

ENGFRAC:

Fraction of a country's population that speaks English as a native language; sources: PT and BMVW.

EURFRAC:

Fraction of a country's population that speaks one of the major languages of Western Europe:

English, French, German, Portuguese, or Spanish; sources: PT and BMVW.

FRANKROM:

Natural log of trade share forecasted by Frankel and Romer's gravity model of international trade which takes both a country's population and its geographical location into account; sources: PT and BMVW.

GASTIL:

Average of indexes for civil liberties and political rights, each index is measured on a 1-to-7 scale with 1 representing the lowest degree of freedom. Countries whose averages are between 1 and 2.5 are called "not free", those between 3 and 5.5 "partially free" and those between 5.5 and 7 as "free"; sources: PT and BMVW.

GOVEF:

Government effectiveness according to the Governance Indicators of the World Bank. Combines perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies into a single indicator. Values between 0 and 10, where higher values signal higher effectiveness; average values for 1996, 1998, 2000, 2002, and 2004; sources: PT and BMVW.

GOVFRAC:

The probability that two deputies picked at random from among the government parties will be of different parties; source: Beck et al. (2002).

GRAFT:

Graft according to the Governance Indicators of the World Bank focusing on perceptions of corruption. Values between 0 and 10, where lower values signal higher effectiveness; average values for 1996, 1998 and 2000; source: Kaufmann, D., Worldbank (2005): Governance Indicators: 1996-2004.

HAPPINESS:

Happiness according to happiness surveys collected by Veenhoven 2004 and arranged on a 10-0-scale with higher values signaling higher happiness.

LAC:

Regional dummy variable, equal to 1 if a country is in Latin America, Central America, or the Caribbean, 0 otherwise; source: CIA (2005).

LAT01:

Rescaled variable for latitude, defined as the absolute value of *LATITUDE* divided by 90 and taking on values between 0 and 1; sources: PT and BMVW.

LOCEXE:

Records whether or not a country's local executives are elected "4" if yes "0" otherwise, source: Kearney (1999).

LOGA:

Natural logarithm of total factor productivity, calculated for the year 2000 on the basis of a Cobb-Douglas-Function following the model of Hall & Jones (1999); source: BMVW.

LOGYL:

Natural logarithm of output per worker calculated for the year 2000 following Hall & Jones (1999).

LPOP:

Natural logarithm of total population (in millions); sources: PT and BMVW.

LYP:

Natural logarithm of real GDP per capita in constant dollars (chain index) expressed in international prices, base year 1985; average for the years 1990 – 1999; sources: PT and BMVW.

MAJ:

Dummy variable for electoral systems, equal to 1 if the entire lower house in a country is elected under plurality rule, 0 otherwise. Only legislative elections (lower house) are considered; sources: PT and BMVW.

MUNI:

0 if neither local executive nor local legislature are locally elected. 1 if the executive is appointed, but the legislature elected. 2 if they are both locally elected; source: Beck et al. (2000).

OECD:

Dummy variable, equal to 1 for all countries that were members of the OECD; source: OECD (2006).

PRES:

Dummy variable for government forms, equal to 1 in presidential regimes, 0 otherwise. Only regimes in which the confidence of the assembly is not necessary for the executive to stay in power (even if an elected president is not chief executive, or if there is no elected president) are included among presidential regimes. Most semi presidential and premier-presidential systems are classified as parliamentary source: constitutions and electoral laws; source: PT and BMVW.

PROP1564:

Percentage of a country's population between 15 and 64 years old among entire population; sources: PT and BMVW.

PROP65:

Percentage of a country's population over the age of 65 in the total population; sources: PT and BMVW.

PROT80:

Percentage of the population in a country professing the Protestant religion in 1980 (younger states are counted based on their average from 1990 to 1995); sources: PT and BMVW.

REVSHARE:

Measures whether a country's central government regularly and unconditionally transfers a portion of national taxes to lower levels of government, "4" if both sub-national levels receive, "2" if one does, "0" otherwise; source: Kearney (1999).

SPL:

Central government budget surplus (if positive) or deficit (if negative) as a percentage of GDP, based on „DEFICIT (-) OR SURPLUS“ as share of GDP average for 1990-1999; sources: PT and BMVW.

SSA:

Regional dummy variable, equal to 1 if a country is in Sub Saharan Africa, 0 otherwise; source: CIA (2005).

SSW:

Central government expenditures consolidated on social services and welfare as a percentage of GDP; sources: PT and BMVW.

SUBVETO:

Dummy variable coded 1 if regionally chosen upper house of parliament has constitutional right to block legislation; source: Treisman (2002).

TOTEXP:

Total government expenditure as share of GDP.

TRADE:

Sum of exports plus imports of goods and services measured as a share of GDP; sources: PT and BMVW.

TRANSFER:

Vertical Imbalance; source: IMF's Government Finance Statistics (GFS), 2002.
