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Decentralization as a disincentive for transnational terror? System stability versus government efficiency: an empirical test

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Abstract

Using panel data for a maximum of 109 countries over the years 1976-2000, we empirically analyze the impact of decentralization on the occurrence of transnational terror. Our results show that expenditure decentralization robustly reduces the number of terror events in a country, while political decentralization has no impact. The effects of decentralization do not transmit through government efficiency and effectiveness, in line with the system stability hypothesis of Frey and Luechinger (2004).

Keywords: Terrorism, Decentralization, Democracy, Governance quality, Government effectiveness

JEL-Codes: D74; H70; H40

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1. Introduction

Following the 9/11 attacks on the World Trade Center the latest, transnational terrorism became subject of intense research. Still, what determines the terrorists' choice of target countries is not yet fully understood. Previous research suggests that political institutions are important. It has been shown, among others, that target countries' degree of democracy, electoral system or institutional constraints to the central government are determinants of terror (Abadie 2006, Frey and Luechinger 2004, Li 2005, Li and Schaub 2004).[1]

In this paper, we propose an additional institutional determinant of transnational terror: a target country's degree of decentralized governance structure. According to the analysis in Bjørnskov, Dreher and Fischer (2008), decentralization increases individual well-being, while Frey, Luechinger and Stutzer (2007) show terrorism to substantially reduce well-being. Arguably, one channel by which decentralization can increase societal welfare might be its impact on terrorism. Indeed, Frey and Luechinger (2004) argue that decentralized countries are politically and administratively more stable than more centralized states. For this reason, decentralized countries are less affected by terrorist attacks – as terrorists perceive the 'benefits' of their activities to decrease with the degree of decentralization. In addition, according to traditional public choice arguments (Brennan and Buchanan, 1990, Tiebout 1961), decentralization might yield efficiency gains in government activities and make the deterrence of terror through national security policies more effective. As a consequence, less terrorist activities should occur in more decentralized countries.

However, the beneficial impact of decentralization on terror prevention is not as obvious as it might look at first sight. The public finance literature suggests that decentralization may harm the production of public safety. For example, decentralization may create coordination problems, lead to an underprovision and underfinancing of public safety,

[1] Regarding the determinants of terror in the terrorists' countries of origin see Freytag, Krüger and Schneider (2006). See Krieger and Meierrieks (2008) for a recent survey on the causes of terrorism.

less policy innovation (Rose-Ackerman 1980, Strumpf 2002), and cause understaffing of security forces and other inefficiencies in fighting terrorism. In consequence, decentralization may make countries more vulnerable to terrorist attacks, as the marginal costs of committing terror are reduced, and we should expect transnational terrorism to be more frequent in such decentralized countries.

The theoretical arguments underlying our analysis are mainly derived from Frey and Luechinger (2004), but also draw from traditional public finance literature. Surprisingly, the hypothesized effects of government decentralization on terror have not yet been empirically tested. This omission is most likely due to the lack of adequate data on terrorism and political decentralization until most recently. Clearly, answering the question whether decentralization deters or attracts terrorists bears important policy implications. Answering this question is the aim of this paper.

Specifically, this paper fills the gap in the literature by testing empirically whether, to what extent, and through which channels decentralization reduces or promotes transnational terror, based on a panel of 109 countries over the period 1976-2000. To anticipate our results, we find that fiscal decentralization reduces the occurrence of transnational terrorist events, while decentralization of political-decision-making across government tiers does not affect terror. We also find evidence supporting the 'system stability' hypothesis of Frey and Luechinger (2004) rather than the 'government efficiency' hypothesis suggested by the traditional promoters of decentralization.

The paper is organized as follows. The next section derives our hypotheses. Section 3 describes our measures of terrorism and decentralization, while the method of estimation is outlined in section 4. The fifth section presents the results and the final section concludes.

2. Hypotheses

We base our hypotheses on the effect of decentralization on transnational terror on two main and rather independent arguments. The first argument relates to the stability of the target country's polity, and how it may be affected by terror ('system stability hypothesis').[2] The second builds on efficiency and effectiveness arguments regarding the provision of public safety ('efficiency hypothesis').

Turning to the first argument, according to Frey and Luechinger (2004), one of the immediate main goals pursued by terrorists is to destabilize the polity of their target country.[3] As Frey and Luechinger argue, "when the government loses power, and more importantly, when the political system's legitimacy is eroded, the terrorists' chances of achieving their goal improve" (ibidem, p.511). Thus, a governance structure that stabilizes the polity in a functional-systemic sense should decrease the marginal benefits of terrorist acts in a terrorists' cost-benefit analysis, reducing the levels of terrorist activities. Linking the argument to decentralization, the authors argue that "a polity with many different centers of decision-making and implementation is difficult, if not impossible, to destabilize" (ibidem, p.512).

For illustration, we propose to think of a biological entity that is composed of a multitude of cells expanding in all three dimensions. In such multi-cell entity, the destruction of one cell does not endanger the entity as a whole, as the remaining cells can take over the functions of the dysfunctional one. This may be observable not only at the horizontal level

[2] Alternatively, but less convincingly, more satisfied citizens might be less willing to support transnational terrorist groups (see, e.g., Li 2005, Dorn et al. 2007).

[3] Gassebner et al. (2007, 2008) provide empirical evidence. According to their results, terrorists are at least to some extent successful in destabilizing the political system, as terror attacks increase the probability of cabinet dissolutions. Two additional intermediate goals of terrorists, as discussed in Frey and Luechinger (2004), are to attract publicity and media attention, and to damage the economy to incur material costs on the population. As these aims are not directly related to decentralization, we do not discuss them here. See Schnellenbach (2006) for a recent discussion of terrorists' motives.

(namely across cells at the same level), but also in the vertical (across layers of cells).[4] Applying this idea to states and their institutional settings, Frey and Luechinger (2004) analogously argue that lower-tier governments and administrations can take over responsibilities of dysfunctional – either higher-tier or other lower-tier – institutions. In contrast, in unitary countries non-functioning and destroyed (political and administrative) centers are likely to lead to country-wide collapse. Thus, decentralization may stabilize the polity by reducing the damage of terror on the governance structure, letting decentralized countries recover more quickly, and decreasing terrorists' expected benefit. Consequently, Frey and Luechinger (2004) argue that 'spatial decentralization' – related to some kind of vertical division of 'decision-making' power but also 'implementation' power between various tiers of government – deters terror. These considerations lead to our first hypothesis.

Hypothesis 1: Decentralization reduces the number of terrorist incidents.

Turning to the second argument, decentralization of the politico-administrative system arguably makes governments more efficient and more effective in the provision of public goods – one of the governments' core responsibilities (Musgrave, 1959). The economic theory of bureaucracy and the literature on institutional competition demonstrate that competition among public agencies reduces bureaucratic waste (e.g., Niskanen 1971), improves respect for regional differences in societal conditions of generating public safety (Tiebout 1961), serves as an information discovery procedure (Hayek 1968), strengthens democratic control over government spending activities ("voice"), and protects the interests of local minorities by facilitating "exit" (Hirschman 1970). Decentralization forces politicians to compete, leading to stronger local democracy, political accountability, and thus, citizens'

[4] The example mentioned in Frey and Luechinger (2004) regarding the elimination of a local government in Switzerland and neighboring communities taking over administrative functions relate to the horizontal level.

control (Betz 1996). Decentralization thus permits dissenting residents to escape local security policies they do not agree to by moving to a different jurisdiction in a Tiebout fashion (Tiebout 1961), inducing incentives for competing local governments to innovate, to work efficiently and to target their security policies effectively (Brennan and Buchanan, 1990).[5] To the extent that decentralization improves security policies, we expect it to make terrorist' activities more costly (in expected terms), reducing their optimal level of terror.

The impact of decentralization on the occurrence of transnational terror is, however, not as obvious as it might look at first sight. Applying alternative public choice arguments that relate to the quality of public safety, decentralization might create coordination problems which may delay or prevent reforms, thus making terror prevention less effective.[6] Moreover, institutional constraints imposed by divided powers in decentralized countries might significantly weaken the federal and local governments' ability to fight both domestic and transnational terror. More specifically, horizontal information externalities might imply the underprovision of policy innovation, preventing sensible institutional reforms that may aggravate these coordination problems and inefficiencies (Rose-Ackerman 1980, Strumpf 2002). Moreover, competition between jurisdictions might cause a "race to the bottom," driving local tax rates below the level necessary to sufficiently finance public safety, leading to its underprovision.[7] In general, small-sized jurisdictions might prevent internalization of positive externalities created by locally produced public safety and, thus, lead to understaffing of security forces. Consequently, decentralized governance structures might allow foreign

[5] Kotsogiannis and Schwager (2005) show that policy innovation might occur more frequently in decentralized systems once politicians' electoral motives are taken into account.

[6] Prud'homme (1995) and Sewell (1996) provide empirical support for this view.

[7] Empirical evidence is, however, not in favour of this hypothesis. For example, Dreher, Gaston and Martens (2008) do not find a significant impact of an index of globalization on tax competition in the OECD.

terrorists to organize and manoeuvre more easily, thereby reducing the costs of transnational terrorist activity.[8]

In addition, according to Li (2005), the abundance of potential targets for terrorist acts makes it easier for terrorists to threaten a country's population. To the extent that a country's number and availability of 'symbolic' targets increase in its degree of political and fiscal decentralization, such country may become a more attractive target for foreign terrorists, as the number of low-cost targets rises.[9] Taken together, decentralization may make countries more vulnerable to foreign terrorists' activities, and we should expect transnational terror to be more frequent in such decentralized countries.

We thus hypothesize:

Hypothesis 2: Decentralization increases the number of terrorist incidents.

3. Measuring Decentralization and Terror

Frey and Luechinger (2004) discuss the effects of two forms of decentralization – decentralization of 'policy implementation' and of 'political decision-making' (ibidem, p.512). Thus, their notion of decentralization captures the two dimensions of '*federalism*' as defined by, e.g., Keman (2000) or Brennan and Buchanan (1980). According to Keman (2000), federalist structures comprise decentralization with respect to "the right to act," on the one hand, and "the right to decide," on the other.[10] In general, political scientists seem to

[8] As one example, one might think of the coordination failure between the various state and federal institutions in the U.S. that prevented an early detection of the World Trade Tower attacks in the planning phase.

[9] However, the value of each particular target might decrease with the number of available targets, decreasing the expected benefit, and making decentralized countries less attractive.

[10] Similarly, Brennan and Buchanan (1980) define 'federalism' to comprise the two dimensions: (i) joint assignment of functions and (ii) taxing power of lower levels of government.

agree that federal structures include "a set of jurisdictional arrangements for allocating policy responsibilities between different levels of government; this refers to both *policy-making* and *policy implementation.*" (Italics by us) (Obinger et al., 2005, p.9).

However, Frey and Luechinger (2004) argue that both decision-making and policy implementation constitute two separate dimensions of a well-functioning decentralized system. Thus, our analysis accounts for these two types of decentralization. Specifically, we distinguish between *decentralization in government spending*, on the one hand, and *local political autonomy*, on the other. The first most closely reflects the implementation of government policies through executing administrations and public goods creation ("the right to act," Keman 2000), while 'local political autonomy' refers to the presence of political decision- and law-making power at the local level ("the right to decide," Keman 2000). In political science, this latter concept is also referred to as 'decision decentralization' or 'local autonomy' (e.g., Treisman 2000).

We employ two measures of decentralization obtained from Treisman (2002), a collection of various indicators of decentralization. Fiscal decentralization is measured employing data from the IMF's Government Finance Statistics (GFS), as originally presented in a dataset compiled by the World Bank and replicated in Treisman (2002).[11] The numerator of these measures is total expenditure of sub-federal government tiers, while the denominator is total spending by all levels of government.[12] Data are employed for the period 1976-2000

[11] See http://www1.worldbank.org/publicsector/decentralization/fiscalindicators.htm (July 6, 2007).

[12] The Treisman data provide an alternative measure of fiscal decentralization, often employed in the literature on federalism that relates to decentralization of revenue. Revenue decentralization is highly correlated with expenditure decentralization ($\rho = 0.91$). Inclusion of both measures of fiscal decentralization shows the dominance of spending decentralization over revenue decentralization (see Table 4 and the corresponding discussion).

for a maximum of 109 countries.[13] Among the countries in our sample, spending decentralization is in the range of 1.65 to 55.62 percent. On average, 21.48 percent of government spending takes place at the sub-federal level (median: 20.27 percent).

As proxy for political autonomy at the sub-federal level, we employ a dichotomous time-invariant indicator that takes the value 'one' if second tier governments "have autonomy in certain specified areas – i.e., constitutional authority to legislate – not explicitly subject to central laws," equally collected around 1996-2000 and obtained from the Treisman cross-section (2002). In other words, political autonomy is assumed to exist when the federal constitution stipulates that laws of the second tier cannot be overruled or constrained by framework legislation by the federal government (Riker 1964).[14] Prominent examples of such autonomous sub-federal entities are the U.S. states, which also differ in their legal systems, and the Swiss 'cantons', in contrast to the German 'Laender', where only policing and schooling are truly independent state responsibilities. Among our sample of countries, about 16 percent are coded as federal with politically autonomous sub-federal tiers.

However, note that despite the fact that our measure of fiscal decentralization seems to be those used most widely in empirical cross-national studies on the effects of centralization (e.g., Lijphart 1977, Fisman and Gatti 2002),[15] it is not free of problems. Kessing, Konrad and Kotsogiannis (2006) provide a summary: First, the sources of the revenues, intergovernmental

[13] Selection of countries and years is driven by data availability.

[14] The Treisman (2002) data provides an alternative, weaker measure of political local autonomy, which also includes cases of so-called 'residual' autonomy, where political decisions at the local level fill the legal gaps in national framework laws, and may be overruled by national legislation. We test for the impact of this variable in the section on robustness.

[15] While this is true for cross-country studies, other political institutions such as direct democracy may be more important for the provisions of public goods on the state level within a country. For example, Fischer (2005) investigates whether direct democracy restricts the Leviathan-like behavior of bureaucracies using an index of direct democracy.

transfers, and other grants are not taken into account. Second, our measure of fiscal decentralization does not account for the extent to which the jurisdictions' tax bases overlap.[16] Third and most importantly, it reflects only the distribution of spending responsibilities but does not contain information about the distribution of political power among the central and sub-national governments. It is for this reason we add a measure of political autonomy separately to our model.

Turning to our measure of terrorist activity, we employ data provided in the MIPT *Terrorism Knowledge Base*.[17] The Terrorism Knowledge Base integrates data from the RAND Terrorism Chronology and RAND-MIPT Terrorism Incident databases, the Terrorism Indictment database, and DFI International's research on terrorist organizations.[18]

The *Terrorism Knowledge Base* defines terror as "violence, or the threat of violence, calculated to create an atmosphere of fear and alarm. These acts are designed to coerce others into actions they would not otherwise undertake, or refrain from actions they desired to take. […] This violence or threat of violence is generally directed against civilian targets. The motives of all terrorists are political, and terrorist actions are generally carried out in a way that will achieve maximum publicity. Unlike other criminal acts, terrorists usually claim credit for their acts. Finally, terrorist acts are intended to produce effects beyond the immediate physical damage of the cause, exerting long-term psychological repercussions on a particular target audience. The fear created by terrorists may be intended to cause people to exaggerate the strengths of the terrorist and the importance of the cause, to provoke governmental overreaction, to discourage dissent, or simply to intimidate and thereby enforce

[16] See Treisman (2002) and Ebel and Yilmaz (2002) for a more detailed discussion.

[17] Available at: http://www.tkb.org/.

[18] There are various sources for terrorism data. We choose MIPT because it combines various sources and thus provides extensive country and yearly coverage. For a detailed discussion on the measurement of terrorism see Frey and Luechinger (2003b).

compliance with their demands."[19] As terrorist acts are defined by their nature (violent and criminal acts), they are included in the database irrespective of the identity of the committing group or their long-term goals. In principle, terrorist acts might well be carried out by the violent branch of the political opposition to the ruling government (e.g., the RAF in Germany).

In this paper, we focus on incidences of transnational terrorism.[20] According to MIPT, transnational terror events are defined according to (1) the provenience of the terrorist or their group or (2) the nature of the terrorists' targets. Thus transnational terrorisms involves either terrorists acting in a foreign country, domestic targets that are associated with a foreign country (such as embassies), or targets of an international character (such as airplanes or UN-related entities). According to this definition, attacks of local residents against their own governments are only defined as transnational terror events if they occur in the name of an internationally working network of terrorists, such as, e.g., Al Qaeda. In contrast, attacks of foreigners would always be counted as 'transnational' incidences.[21]

To give two illustrative examples: an attack of the Indian embassy in Pakistan would be counted as a transnational terror act that occurred in Pakistan, while an attack to a Pakistani grocery store would be counted as domestic terrors act in Pakistan, if committed by a domestic terror group. However, if carried out by foreigners, by a group founded in a foreign country or affiliated with it, the attack on the grocery store would be counted as a transnational terror act in Pakistan.

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[19] See the glossary that accompanies the MIPT database. See also Enders and Sandler (1999, 2002).

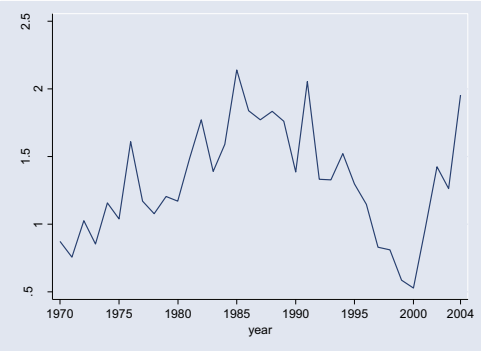
[20] While our hypotheses directly refer to transnational terrorism, there is an additional reason for excluding domestic terror: reliable panel data on domestic terrorism is only available for a short (and recent) period of time.

[21] The definition of MIPT for transnational events is close to that of Sandlers and Enders (2004), who base it on either the terrorist group's international ramifications or its foreign interest as target.

We extract the number of transnational terror events for each country and year.[22] Given that the database covers the whole world, we assign 'zeros' to all countries and years with no recordings. According to our sample of 109 countries from 1976-2000, the number of terrorist events per country during the total sample period varies from 0 to 50 with an average of about 1.70 (or 4.57 for those country-year observations with positive values). Altogether, there were 710 country-years with actual incidences of transnational terror in our panel (and 1911 country-year observations altogether). Appendix C presents the average number of transnational terrorist events in the world by year.

Figure 1 shows how the world average of terror events has evolved over time.[23] As can be seen, the average number of transnational terror events fluctuates around the mean from 1976 to 1996, slightly declines from 1996 on, and rises sharply again after 2000. We have to restrict our sample to the period prior to the year 2001 because data for our focal determinant, fiscal decentralization, is only available until 1999/2000.

Figure 1: Development of Transnational Terror over time



[22] Territories are assigned to the country formally governing the territory; if no assignment is possible, the observations are excluded from the sample (e.g. Kashmir and the Persian Gulf).

[23] For time-series studies on the occurrence and distribution of terrorism see Enders and Sandler (2005, 2006).

4. Method

We estimate random effects regressions for panel, non-negative count data. The data extend to a maximum of 109 countries and cover the years 1976-2000. Since some of the data are not available for all countries or years, the panel data are unbalanced and the number of observations depends on the choice of explanatory variables. As our data on terror events are strongly skewed to the right (with an accumulation of observations at zero) and display significant overdispersion (with the variance being greater than the mean), we estimate our regressions employing the Negative Binomial estimator.

We estimate the following relationship:

$$terror_{it} = F(decent_{jit-1}, X_{i,t-1}, \lambda_t), \quad (1)$$

where $terror_{it}$ represents the number of recorded transnational terror events in country i in period t, and $decent_{jit-1}$ is our j^{th} (lagged) measure of decentralization. $X_{i,t-1}$ is the vector of (lagged) control variables, and λ_t are fixed time effects. The low correlation between political autonomy and fiscal decentralization allows their joint inclusion.[24] As local autonomy shows no time series variation, the model is estimated with random effects. Note that the Hausman test favours this model over pooled Negative Binomial regressions. When employing fixed effects (and omitting local autonomy) as test for robustness the main results are unchanged.

Note that our analysis focuses on the target countries of terrorism rather than its origins. In choosing our control variables, we thus follow Dreher and Gassebner (2008) who equally aim at analyzing terror in target countries. We employ GDP per capita (measured in constant 2000 US$). On the one hand, richer countries are more attractive targets for terrorists, as terror creates more media attention. On the other hand, richer countries can afford stronger police and intelligence agencies, potentially being more able to prevent terror. The impact of per capita GDP is thus not obvious a priori.

[24] Correlation coefficient between political autonomy and fiscal decentralization is 0.4.

A second variable suggested to be important for terror is the extent of civil liberties, comprising political participation possibilities and aspects of economic and social freedom (see Freedom House 2005). In the context of transnational terrorism, civil liberties most likely increase terror. Strongly democratic, economically liberal, mostly Western countries may attract transnational terrorist activities as they symbolize such 'civil liberties'. In addition, politically free countries are frequently also allies of the United States and, thus, brought in association with its propagated values. Before 1990, such countries would have been chosen as preferred targets by pro-communist groups, in particular, while, after the breakdown of communist regimes violent anti-Western, pro-Islamic or anti-globalization groups may choose them as preferred targets.

However, repressive states might be better able to suppress terror, e.g., through constraining the media echo or generating high levels of public safety (a prominent example is China).[25] On the other hand, transnational terror may even be attracted by the absence of political rights, possibly being correlated with a state in transition or decay, leading to dysfunctional administrative institutions and less effective public safety provision. Decreasing the costs of terror acts, such countries are more likely to become preferred targets, particularly if, despite the institutional decay, media response can be expected (a prominent example is Iraq).[26] In line with Piazza (2006) and Dreher and Gassebner (2008), we include both the level of and changes in political freedom.

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[25] There is also literature relating political participation to the local residents' willingness to support terror groups. Arguably, this argument is more likely to hold for domestic terrorism, interpreting terror as form of 'expressive' voting (see, e.g., Frey and Luechinger 2003a, 2004, Li 2005, Li and Schaub 2005).

[26] Sandler (1995) provides an excellent discussion of the early literature on the relationship between democracy and terror. Iraq is a present-time example of the relation between missing political freedom and 'imported' transnational terrorism. The occupation by the USA guarantees considerable media attention in a country apparently serving as battle field for neighboring countries' terror groups fighting for regional hegemony.

Third, we include population size, as in larger countries transnational attacks might attract greater international media attention. Furthermore, the costs of state surveillance and policing arguably rise with population size, leading to lower levels of public safety (Piazza 2006).

Fourth, we include government fractionalization. According to Piazza (2006), to some extent the number of parties in power proxies for "social cleavage," potentially giving rise to terror: Domestic social cleavages, reducing social cohesion, social capital such as careful neighborhood watching and social control (Putnam 2000), however, might reduce the costs of transnational terrorism. On the other hand, fractionalized coalition governments may represent a larger number of social groups compared to a single party government (Lijphart 1977), decreasing social tensions in society and, thus, contributing to system stability which reduces transnational terrorists' expected benefits.

Finally, we include data on voting coincidence with the U.S. in the UN General Assembly as provided by Voeten (2004). As shown in Dreher and Gassebner (2008), countries voting more frequently in line with the U.S. in the Assembly are more likely to become victims of terror. This effect may be particularly strong for transnational terror, where foreign terrorists may attack the more vulnerable allied countries as substitute for the better protected and less accessible USA. We follow Thacker (1999), coding votes in agreement with the U.S. as 1, votes in disagreement as 0, and abstentions or absences as 0.5. The resulting numbers are then divided by the total number of votes in each year. This results in a variable ranging from zero to one, with zero indicating total disagreement with the U.S., and one showing full agreement.

Data for per capita GDP and population are taken from the World Bank (2006). Government fractionalization is from Beck et al. (2001) and measures the probability that two randomly drawn members from among the government are of different parties. Level and

change in political freedom are based on the average of the two political rights and civil liberties indices from Freedom House (2005), with levels measured on a scale from -7 (low) to -1 (high).

5. Results

5.1. Baseline Model

Table 1 shows the results. We first include fiscal decentralization and political autonomy separately (columns 1 and 2), while column 3 includes them jointly. All models include dummies for each year, which are always jointly significant at the one percent level. Overall, our results for the control variables mirror those reported in Piazza (2006) and Dreher and Gassebner (2008). As can be seen, the number of terror events increases with larger population, possibly reflecting greater social and ethnic cleavages but also larger international media response. (However, it may well reflect a simple scale effect, as larger countries experience more terror events, c.p.) The coefficient of population size is significant at least at the five percent level, while the impact of government fractionalization is marginally insignificant according to the full model of column 3, but significant at the five percent level at least in columns 1 and 2.[27] In two of the three specifications, terror also rises with the level of civil liberties and greater voting coincidence with the U.S. in the UN General Assembly, at least at the ten percent level of significance. As argued before, both may capture the proximity of a country's democratic value system and foreign policy to that of the U.S., making the country a 'substitute target', but with possibly lower 'entry' costs. GDP per capita is not consistently significant at conventional levels, which is consistent with Krueger and

[27] The coefficients are significant at the five percent level at least – with the exception of government fractionalization which is marginally insignificant according to column 3.

Malečková (2003) and Abadie (2006). Changes in political freedom have no significant impact on terror according to all specifications.

Turning to our variables of primary interest, the results show a significant effect of expenditure decentralization on terror, at the ten percent level of significance in column 1, and at the one percent level according to the full model of column 3. Our results show that more spending responsibilities for local governments reduce the number of terror events in the target country. This result is in line with our a priori hypothesis regarding the division of administrative and executing responsibilities across government tiers. Calculating the marginal effect of fiscal decentralization for the full model (column 3), the results show that the number of terror events declines by 0.03 with an increase in decentralization by one percentage point. Thus, for example, evaluated at the sample mean, the model predicts that raising the share of sub-federal spending from 20% to 50% (which is realistic given the variation in our regression sample from 1.5% to 55.6%) will reduce the number of incidences by almost half from 1.49 to 0.76. Clearly, this impact is quantitatively relevant and bears important welfare implications.[28]

The results of columns 2 and 3 also show that local political autonomy does not affect the number of terror events, neither separately nor when included jointly with fiscal decentralization. This finding contradicts the hypothesis that more political autonomy deters terrorism. Potentially, the insignificance of political autonomy might be caused by two opposing effects: on the one hand, local decision-making power might well decrease terrorists' marginal benefits through political stabilization or enhancements of local public safety provision (Frey and Luechinger 2004); on the other hand, a politically decentralized

[28] See Frey, Luechinger and Stutzer (2004) for an attempt to measure the welfare costs of terrorism.

government may also provide more numerous potential symbolic-bearing targets for terrorist attacks, as Li (2005) argues. Unfortunately, both effects cannot be disentangled.[29]

Columns 4 and 5 of Table 1 distinguish terror events that can be considered to be marginal from those which are severe. For the latter, we count all terrorist events in which at least one person was physically harmed – namely all events in which the number of persons killed or injured was greater than zero. Of course, it is debatable which threshold constitutes a severe event. Following Dreher, Gassebner and Siemers (2007), we choose the lowest threshold possible. While this may be the most simple/intuitively appealing choice from our point of view, we are clearly aware that even 'less severe' events may still have a major psychological or economic impact on the population as, e.g., the London bombings of July 21, 2005.

Columns 4 and 5 suggest that the overall results observed previously are driven by severe events. Significant at the 1 percent level, fiscal decentralization reduces the number of severe terror events but does not affect less severe events at conventional levels of significance. According to the marginal effects in column 4, an increase in fiscal decentralization reduces the number of severe terror events by 0.15, which is quantitatively about 5 times larger as compared to the effect for the overall sample. For illustration, a simulated rise in the degree of spending decentralization from 20% to 50% (which is realistic given the variation in our regression sample from 1.5% to 55.6%) would decrease the predicted number of severe terror events by roughly 2.7, from 3.9 down to 1.2. Compared to the effect for all events, the decrease in absolute terms is more than quadruple in size (-0.63 versus -2.7).

Table 2 tests for the robustness of our results to the inclusion of additional variables that have been proposed as determinants of terror in the previous literature or are intuitively appealing as such. As in Piazza (2006) and Dreher and Gassebner (2008), we test for the

[29] Results are qualitatively identical when a Tobit model is estimated or a dichotomous variable of the occurrence of transnational terror is analyzed with Logit estimation.

sensitivity of the estimates to the inclusion of population growth and GDP growth. According to Piazza (2006), the first puts pressure on a countries' economic and political system, increasing an attack's destructive impact on the polity, rising terrorists' expected benefits. However, GDP growth may equally well be correlated with reductions in poverty, potentially increasing terrorists' costs through improved governance quality. We will turn to the role of governance quality below. In addition to government fractionalization that is included in the main regression, we also test for the impact of four alternative measures of 'social cleavage' that make the polity more vulnerable to attacks: ethnic fractionalization, language fractionalization, religion fractionalization, and fractionalization of the parliamentary opposition. Similarly, recently founded states might have still weak and ineffective institutions, contributing to their system instability and insufficient public goods provision. We also include a dichotomous variable that takes the value 'one' if the country is in a state of internal or external war. Again, analogously to the previous argument, we can expect government institutions to not work well and basic human rights to be severely constrained at times of war, giving rise to system instability, promising greater damage and decreasing costs of terror acts. (Note that we analyze the potential direct effects of governance quality below.) Finally, we test for the hypothesis that inertia may play a role by adding the lagged dependent variable on the right hand side of the equation.

As can be seen from Table 2, most of the additional variables are completely insignificant. The exceptions are the war dummy and the dummy for new states that are significant at the five percent level, with a positive and, respectively, a negative coefficient. Column 9 shows that the main findings are insensitive to the inclusion of the lagged dependent variable as measure of inertia, which turns out significant at the 1 percent level.[30] Most importantly, in all specifications the negative impact of expenditure decentralization on

[30] This result holds when OLS is applied. Note that the Hurwicz (1950) bias is sufficiently small to justify non-instrumentation of the lagged dependent variable with a time-series dimension of about 30 years.

terror stays significant at the five percent level. Moreover, its coefficient is of similar size across all estimated models, which shows that decentralization is not strongly correlated with any of these new determinants added to the model. The main findings equally prevail when alternative estimation methods are applied, such as Tobit and Logit estimators (not reported).[31]

The Treisman data provides an alternative index of weaker political local autonomy, which measures so-called 'residual' autonomy, where political decisions at the local level fill the legal gaps in national laws, and may be overruled by national legislation.[32] Replacing 'political autonomy' with this 'residual autonomy' measure yields qualitatively identical results in all models of Tables 1 and 2 (not reported).

We conclude that our results are robust to the choice of control variables.[33]

5.2. Transmission channels of decentralization

As described in the theory section above, decentralization may reduce terror because it makes the political system and the polity more stable ('system stability hypothesis') and thus more immune against the negative effects of transnational terrorist acts, decreasing terrorists' expected benefit. Alternatively, decentralization may simply yield efficiency gains and improve effectiveness in the provision of 'public safety', increasing the terrorists' expected costs, so that our measure of general decentralization only approximates the cost structure of providing public goods.

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[31] Tobit models do not take account of the (count) structure of the data, while Logit can not use information contained in the frequency of attacks but reduces this information to a binary dependent variable, indicating the occurrence of terror instead.

[32] A prominent example of such political autonomy is the German Laender.

[33] We also replicated the analysis for a sample of countries without political autonomy. The results are not affected.

In Table 3, we test for a potential transmission channel of the beneficial impact of fiscal decentralization, augmenting our baseline model with two measures of production efficiency and effectiveness: First, we employ an indicator of bureaucratic quality, obtained from the International Country Risk Guide's (ICRG) Political Risk database, for the years 1984 to 2005. Second, we use a measure of government effectiveness, available from the year 1996 onwards, and constructed by Kaufman et al. (2003). The first measure is based on information on subjective evaluations of "autonomy from political pressure," "strength and expertise to govern without drastic changes in policy or interruptions in government services" when governments change, and "established mechanisms for recruiting and training" (PRS Group, 1998). Government effectiveness measures the competence of the bureaucracy and the quality of public service delivery, based on a substantial number of perceptions-based indicators from various surveys on government swiftness of response, efficiency and effectiveness in meeting local and national demands, mostly based on information collected from internationally working businessmen and managers (Kaufman et al., 2003).[34] For both measures, higher values indicate more bureaucratic control or government effectiveness, respectively.

If the 'efficiency hypothesis' holds, the inclusion of either direct measure of government efficiency would arguably reduce the effects of decentralization – in terms of size and/or statistical significance. When the 'political system stability hypothesis' prevails, decentralization should still play a major role for explaining the occurrence of terror even when we control for government effectiveness.

[34] The public goods production evaluated by Kaufman et al. (2003) includes, for example, tax collection, effective implementation of national policies and government decisions, coordination between government tiers, civil service and quality of bureaucracy, and national infrastructure (telecommunication, electricity, transportation), response to natural disasters, government personnel quality, issues of institutional rigidity, government stability and policy consistency, trust in police, and quality of public schools.

Table 3 shows the baseline regressions of columns 1 and 2 of Table 1, augmented with the two measures of government effectiveness and reduction of bureaucratic waste. For comparison, Table 3 also contains the baseline model excluding measures of government efficiency, estimated for the identical regression sample. This sample is smaller than the one used for the original model of Table 1 above, due to missing data. Again, fiscal decentralization is negatively related to the occurrence of transnational terror events. Columns 1 and 3 show that improved government quality measured by the ICRG index significantly reduces transnational terror (at the five percent level), in support of the 'efficiency hypothesis'. The insignificance of the Kaufman index of government effectiveness, albeit with a negative coefficient, might be due to the substantially smaller regression sample, excluding all observations prior to 1996 (and thus most of our original sample). As in Table 1, the inclusion of political autonomy (not significant) does not qualitatively alter these main results throughout.

Turning to the effect of fiscal decentralization, the coefficients of our decentralization measures become marginally insignificant when the Kaufmann index is included. In all regressions shown in Table 3 the negative sign remains. Obviously, the smaller sample size is an obstacle to identifying the effects. In contrast, in the larger samples with about 500 observations (for the ICRG index in columns 1 through 4), the impact of fiscal decentralization is either significant at conventional levels or only marginally insignificant. In addition, the coefficients of decentralization are similar across models including and excluding government effectiveness. Calculating the marginal effects for decentralization reveals the same picture. Also note that the levels of significance are not substantially lower as compared to the original model in Table 1 above.

In summary, we do not find that the impact of decentralization on terror is mediated by government effectiveness and bureaucratic quality. Our results thus rather support the 'system

stability hypothesis' proposed by Frey and Luechinger (2004), although we can not directly test for this channel.

6. Summary and Conclusion

This paper empirically analyzes the impact of decentralization on the occurrence of transnational terror using panel data for a maximum of 109 countries over the years 1976-2000. We find that expenditure decentralization reduces the number of terror events in a target country, while political decentralization has no impact. In the words of Keman (2000), we find the 'power to act (= spend)' to matter more than the 'power to decide' for the fight against transnational terrorism.

Building closely on Frey and Luechinger (2004) – also in distinguishing decentralization of policy implementation from decentralization of political decision-making – our empirical analysis suggests that effective local government administrations (potentially taking over responsibilities from other dysfunctioning local or supra-local administrations) are more important in stabilizing a country than the dispersion of actual decision-making authority at the local level. However, local spending autonomy may simply increase competition among jurisdictions, thereby improving the quality of 'security'. Our attempt to empirically discriminate between these two channels of decentralization yields findings in support of the 'system stability hypothesis' rather than the 'efficiency hypothesis'.

Our results bear important policy implications. Since the seminal work of Becker (1968), economists view undertaking criminal acts as the outcome of rational decision-making. Applying this rational choice model of criminal behavior to terrorists' decisions, additional terror will occur when the expected marginal benefit of an additional terrorist act outweighs its marginal costs. Indeed, it has been shown that the propensity to commit terrorist acts can be influenced by changes in external costs and benefits (Enders and Sandler 1995). Traditional strategies for combating terror aim at raising the direct or opportunity costs of

committing such acts, while more recent approaches focus on reducing the (expected) benefits of terrorist activity, particularly in light of failing deterrence strategies (Lichbach 1987, Frey 1988, Sandler and Enders 2004, Wilkinson 2002). In this paper, we have shown that greater spending decentralization might be one instrument to influence terrorists' marginal costs and benefits, reducing the occurrence of transnational terror. Previous research has argued that decentralized spending competences lead to inefficient overspending and create problems of coordination, thereby preventing effective security and finally making a country more attractive for terrorist activity. As we have shown in this paper, on average, the opposite is true: decentralization reduces transnational terror. However, we find no evidence that this effect is due to improvements in the quality of governance. Although we can not test for this directly, decentralization affects terror most likely through stabilizing the political and administrative organization in a country, as suggested by Frey and Luechinger (2004). According to these results some policy makers' calls for greater centralization in the 'fight against terrorism' should be treated with caution.

Table 1: Decentralization and Terror, NBR, 1976-2000

	(1)	(2)	(3)	(4)	(5)
Fiscal decentralization (t-1)	-0.015*		-0.022***	-0.040***	0.007
	[1.82]		[2.65]	[4.12]	[0.71]
Political autonomy		0.321	0.139	-0.378	0.214
		[1.43]	[0.49]	[1.29]	[0.71]
(log) GDP per capita (t-1)	0.219**	0.104	0.174	0.132	0.187
	[2.13]	[1.44]	[1.59]	[1.01]	[1.32]
(log) Population (t-1)	0.462***	0.160**	0.407***	0.625***	0.099
	[4.98]	[2.48]	[3.85]	[5.24]	[0.91]
Political freedom (t-1)	0.104*	0.034	0.151**	0.216***	-0.051
	[1.71]	[0.81]	[2.25]	[2.61]	[0.49]
Political freedom, change	-0.002	-0.102	0.013	0.065	0.037
	[0.01]	[1.31]	[0.10]	[0.34]	[0.18]
Government fractionalization (t-1)	0.538**	0.548***	0.418	0.601*	-0.162
	[2.27]	[3.20]	[1.62]	[1.77]	[0.41]
Voting with U.S. (t-1)	1.458**	0.557	1.524**	2.399**	-0.714
	[2.05]	[1.03]	[2.04]	[2.50]	[0.62]
Constant	-10.735***	-3.223**	-9.220***	-12.962***	-5.720**
	[5.34]	[2.31]	[3.99]	[4.84]	[2.26]
Observations	934	1911	826	826	826
Sample	all	all	all	severe	less severe
Number of countries	76	109	63	63	63
Wald test (Prob>chi2)	0.00	0.00	0.00	0.00	0.00

Notes:
The dependent variable is the number of transnational terror events in a particular year and country (columns 1-3, 5-7) or a dummy with value ‘1’
All regressions include time fixed effects.
Absolute value of z statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2: Decentralization and Terror, NBR, 1976-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fiscal decentralization (t-1)	-0.022***	-0.022***	-0.023***	-0.019**	-0.021**	-0.025***	-0.023***	-0.025***	-0.020**
	[2.64]	[2.62]	[2.77]	[2.25]	[2.48]	[2.95]	[2.65]	[2.75]	[2.52]
Political autonomy	0.139	0.139	0.172	0.266	0.095	0.226	0.131	0.259	0.275
	[0.49]	[0.49]	[0.58]	[0.96]	[0.32]	[0.79]	[0.46]	[0.83]	[1.01]
(log) GDP per capita (t-1)	0.185*	0.174	0.056	0.165	0.196	0.099	0.177	0.064	0.194*
	[1.68]	[1.58]	[0.47]	[1.57]	[1.63]	[0.83]	[1.59]	[0.53]	[1.84]
(log) Population (t-1)	0.411***	0.407***	0.331***	0.356***	0.413***	0.441***	0.409***	0.363***	0.379***
	[3.90]	[3.85]	[3.02]	[3.41]	[3.87]	[4.15]	[3.85]	[2.94]	[3.78]
Political freedom (t-1)	0.150**	0.151**	0.159**	0.191***	0.159**	0.130*	0.153**	0.155*	0.130**
	[2.23]	[2.24]	[2.35]	[2.80]	[2.29]	[1.89]	[2.25]	[1.89]	[1.99]
Political freedom, change	0.019	0.013	-0.025	0.010	0.019	0.012	0.014	-0.034	0.014
	[0.14]	[0.10]	[0.19]	[0.07]	[0.14]	[0.09]	[0.10]	[0.24]	[0.10]
Government fractionalization (t-1)	0.413	0.417	0.377	0.373	0.406	0.448*	0.420	0.530*	0.292
	[1.60]	[1.62]	[1.45]	[1.48]	[1.57]	[1.74]	[1.63]	[1.88]	[1.15]
Voting with U.S. (t-1)	1.519**	1.524**	1.674**	0.996	1.510**	1.933**	1.491*	1.583*	1.220*
	[2.03]	[2.04]	[2.18]	[1.33]	[2.02]	[2.45]	[1.93]	[1.93]	[1.68]
GDP growth (t-1)	0.005								
	[0.40]								
Population growth (t-1)		0.000							
		[0.01]							
New state, dummy			-0.269**						
			[2.24]						
War, dummy				0.694**					
				[2.30]					
Ethnic fractionalization					0.268				
					[0.44]				
Language fractionalization						-0.834			
						[1.62]			
Religious fractionalization							0.092		
							[0.17]		
Opposition fractionalization								-0.085	
								[0.28]	
dependent variable (t-1)									0.035***
									[5.70]
Constant	-9.390***	-7.544***	-5.019**	-8.350***	-9.582***	-9.010***	-9.279***	-5.645**	-8.89***
	[4.06]	[3.31]	[2.04]	[3.70]	[3.91]	[3.90]	[3.96]	[2.22]	[4.05]
Observations	823	826	767	767	826	826	826	717	826
Number of countries	63	63	60	60	63	63	63	54	63
Wald test (Prob>chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:
The dependent variable is the number of transnational terror events in a particular year and country.
All regressions include time fixed effects.
Absolute value of z statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Transmission channels of decentralization, NBR, 1976-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bureaucratic quality (t-1)	-0.116**		-0.116**					
	[2.47]		[2.30]					
Gov. effectiveness (t-1)					-0.501		-0.65	
					[0.95]		[1.03]	
Political autonomy			0.106	0.034			0.061	0.03
			[0.33]	[0.10]			[0.08]	[0.04]
Fiscal decentralization (t-1)	-0.017	-0.021*	-0.024**	-0.029**	-0.031	-0.035	-0.033	-0.038
	[1.50]	[1.84]	[2.02]	[2.42]	[1.42]	[1.58]	[1.23]	[1.45]
marginal effects	-0.02	-0.026	-0.026	-0.034	-0.01	-0.011	-0.01	-0.012
fiscal decentralization	1.42	1.7	1.82	2.07	1.38	1.53	1.19	0.89
(log) GDP per capita (t-1)	0.288*	0.15	0.324**	0.196	0.523	0.164	0.621	0.146
	[1.87]	[1.02]	[1.99]	[1.25]	[1.09]	[0.58]	[1.09]	[0.46]
(log) Population (t-1)	0.626***	0.604***	0.614***	0.599***	0.754***	0.735***	0.790***	0.781***
	[5.43]	[5.07]	[4.64]	[4.37]	[3.54]	[3.52]	[3.08]	[3.09]
Political freedom (t-1)	0.104	0.098	0.105	0.11	-0.036	-0.068	-0.01	-0.016
	[1.20]	[1.12]	[1.12]	[1.18]	[0.16]	[0.32]	[0.04]	[0.06]
Political freedom, change	-0.209	-0.19	-0.234	-0.209	-0.913	-0.996	-0.899	-1.007
	[1.27]	[1.19]	[1.37]	[1.25]	[1.49]	[1.64]	[1.38]	[1.54]
Government fractionalization (t-1)	0.886***	0.930***	0.680**	0.690**	0.5	0.469	0.179	0.048
	[2.85]	[2.97]	[2.05]	[2.03]	[0.61]	[0.57]	[0.19]	[0.05]
Voting with U.S. (t-1)	2.320**	1.533*	2.614**	1.861*	4.457*	4.811*	4.766	5.292*
	[2.42]	[1.67]	[2.57]	[1.89]	[1.74]	[1.94]	[1.52]	[1.76]
Constant	-11.529***	-10.682***	-13.267***	-10.909***	-3.967	-1.539	-3.028	-1.416
	[4.59]	[4.23]	[4.57]	[3.70]	[0.01]	[0.00]	[0.00]	[0.00]
Observations	517	517	463	463	149	149	136	136
Number of countries	58	58	49	49	48	48	43	43
Wald test (Prob>chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:
The dependent variable is the number of transnational terror events in a particular year and country. A terror event is defined as severe when at least one person has been injured or killed.
Regressions in columns 2, 4, 6, 8 are based on the regression samples in regressions 1, 3, 5 and 7, respectively.
All regressions include time fixed effects.
Absolute value of z statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

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Appendix A: Descriptions and sources

Variable	Definition	Source
Number of terror events	Number of transnational terror events for each country and year, defined as "violence, or the threat of violence, calculated to create an atmosphere of fear and alarm."	MIPT Terrorism Knowledge Base
Fiscal decentralization	Total expenditure of sub-national government tiers divided by total spending by all levels of government.	IMF's Government Finance Statistics
Political autonomy	Dichotomous indicator of autonomy of second tier governments that takes on the value of one if "subnational legislatures have autonomy in certain specified areas – i.e. constitutional authority to legislate – not explicitly subject to central laws."	Treisman (2002)
(log) GDP per capita	Gross domestic product divided by midyear population. Data are in constant U.S. dollars.	World Bank (2006)
(log) Population	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship, except for refugees not permanently settled in the country of asylum.	World Bank (2006)
Political freedom	Average value of political rights and civil liberties, ranging from -7 to -1, where higher values reflect greater freedom.	Freedom House (2005)
Political freedom, change	Yearly change in index ranging from 1 to 7, where higher values reflect greater freedom.	Freedom House (2005)
Government fractionalization	Probability that two deputies picked at random from among the government parties will be of different parties(low(0)-high(1)).	Beck et al. (2001)
Voting with U.S.	Votes in agreement with the US are coded as 1, votes in disagreement as 0, and abstentions or absences as 0.5. The resulting numbers are then divided by the total number of votes in each country and year.	Dreher and Sturm (2006)
GDP growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars.	World Bank (2006)
Population growth	Annual population growth rate, based on the de facto definition of population.	World Bank (2006)
New state, dummy	The timing of national independence (0 if before 1914; 1 if between 1914 and 1945; 2 if between 1946 and 1989; and 3 if after 1989).	Gallup et al. (2001)
War, dummy	Dummy for countries that had external war over the period 1960-85.	Gallup et al. (2001)
Ethnic fractionalization	$\text{Fractionalization}_j = 1 - \sum_{i=1}^{n} s_{ij}^2$ with s_{ij} being the share of group i in country j.	Alesina et al. (2003)
Language fractionalization	$\text{Fractionalization}_j = 1 - \sum_{i=1}^{n} s_{ij}^2$ with s_{ij} being the share of group i in country j.	Alesina et al. (2003)
Religious fractionalization	$\text{Fractionalization}_j = 1 - \sum_{i=1}^{n} s_{ij}^2$ with s_{ij} being the share of group i in country j.	Alesina et al. (2003)
Opposition fractionalization	Probability that two deputies picked at random from among the opposition parties will be of different parties(low(0)-high(1)).	Beck et al. (2001)
Bureaucratic quality	Index of bureaucratic quality on a scale of 1-12, with higher values indicating higher quality.	PRS Group (1998)
Government effectiveness	'Government effectiveness' component of the Kaufman governance quality indicator of 1998. According to Kaufman et al. (2003), this indicator is based on a regression with data from various distinct sources and reflects the quality of public service provision and 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. The main focus of this index is on "inputs" required for the government to be able to produce and implement good policies and deliver public goods. The value of the index ranges from -2.5 to 2.5.	Kaufman et al. (2002)

Appendix B: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Number of terror events	1.70	4.59	0.00	50.00
Fiscal decentralization	20.84	13.48	1.45	55.62
Political autonomy	0.15	0.36	0.00	1.00
(log) GDP per capita	7.51	1.53	4.31	10.64
(log) Population	15.95	1.61	12.29	20.95
Political freedom	-3.66	1.97	-7.00	-1.00
Political freedom, change	0.03	0.46	-4.00	3.50
Government fractionalization	0.20	0.29	0.00	1.00
Voting with U.S.	0.30	0.15	0.06	0.84
GDP growth	3.08	5.79	-51.03	38.20
Population growth	1.73	1.44	-16.55	18.71
New state, dummy	1.25	1.03	0.00	3.00
War, dummy	0.14	0.35	0.00	1.00
Ethnic fractionalization	0.43	0.26	0.00	0.93
Language fractionalization	0.39	0.29	0.00	0.92
Religious fractionalization	0.41	0.25	0.00	0.86
Opposition fractionalization	0.49	0.29	0.00	1.00
Bureaucratic quality	8.71	2.99	2	12
Government effectiveness	0.68	0.89	-0.965	2.16

Note: Statistics are based on the estimation sample of Table 1, column 2.

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