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An empirical analysis of state fragility and growth: The impact of state ineffectiveness and political violence

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An empirical analysis of state fragility and growth

The impact of state ineffectiveness and political violence

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Abstract: The role of the state in promoting development is well established in the institutional economics literature. Yet, in recent decades the attention has been turned to the opposite side of the spectrum. Facing high levels of poverty and showing a slower progress in achieving development outcomes, fragile states raised concerns among the development community, which felt urged to assist them. However, the quantitative empirical literature examining the link between state fragility and development is still relatively scanty. This paper sheds light on this issue by proposing an approach that comprises indicators for state ineffectiveness and political violence as two dimensions of state fragility, and by using data for the period 1993–2012 in order to understand their impact on growth. The results from standard econometric methods suggest that there is a significant negative effect of state ineffectiveness on economic growth, whereas they fail to find any significant impact of political violence.

Keywords: state fragility, state ineffectiveness, political violence, economic growth, OLS, IV
JEL codes: H11, O11, O43

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1 Introduction

The role of the state in promoting development has been discussed at length in the institutional economics literature. Recent reviews highlight that, notwithstanding the variety of perspectives, existing studies agree on some common state characteristics that are favourable to the promotion of development (Bardhan 2016). However, as a result of the events over the last decades (e.g. the 9/11 attacks), increasing attention has been brought to the implications for development when a state fails to fulfil these features. Facing high levels of poverty and showing a slower progress in achieving development outcomes, fragile states attracted the attention from the development community, which felt urged to assist them. The focus is back on the state, but the quantitative empirical literature examining the link between state fragility and development is still relatively scanty. This paper sheds light on this issue by applying standard econometric techniques to data for the period 1993–2012, and by using indices of state ineffectiveness and political violence as the core dimensions of state fragility, to understand their impact on growth.

The weight of the evidence suggests that, as expected, state ineffectiveness has a significant negative effect on economic growth. This result is robust to variations in the data used and the estimation method employed. The conclusion for the effect of political violence is less clear-cut. In contrast to the expectation, there is some evidence suggesting a positive effect, but this result is not robust to variations in the specifications used. Additionally, the estimated coefficients show no robust effect of fragility on growth when a unidimensional index is considered.

This has important implications for development policy. Firstly, it provides some support for the view reiterated recently in the World Development Report 2017 (World Bank 2017) that improving governance is essential to overcome the challenges currently faced by developing countries. Secondly, this paper concurs to the argument that, in order to unpack the complexity of state fragility and its effects, one should consider its different dimensions separately.

The paper is organized as follows. The next section establishes the links between this analysis and the existing literature. Section 3 explains how state fragility is conceptualized and measured, whereas section 4 presents the empirical model and describes the data used. The main results are analysed in section 5, which also includes some robustness checks. Finally, section 6 discusses the results in relation to the existing literature, and section 7 concludes.

2 Overview of the literature

Despite being at the core of the discourse on fragile states, the link between state fragility and economic development has only been examined in the context of cross-country regressions in a few studies.[1] Bertocchi and Guerzoni (2010) distinguish between empirical studies focusing on the direct impact of fragility on economic development, and those exploring an indirect effect through aid. This paper contributes to the first of these groups.

[1] The field of political science is not short of accounts of the challenges imposed by failing and failed states, especially before the fragile states term came into use. The reports from development organisations also include quantitative and qualitative evidence on the effects of state fragility on development. Given the focus of this paper, these are not reviewed here.

In an early account, Chauvet et al. (2007) explore the costs of failing states, defined as the Low-Income Countries Under Stress (LICUS) that have been in this position for a continuous period of at least four years. Considering the period 1998–2001, they add dummy variables for failing states, for states in civil war, and for neighbourhood spillovers to a growth regression, and then use ordinary least squares (OLS) and Generalized Method of Moments (GMM) methods to estimate the percentage of reduction in the growth rate. They conclude that being a failing state at peace corresponds to a decrease in the growth rate by 2.6 per cent when compared to countries at peace with adequate policies and governance. Furthermore, a switch from peace to war leads to a further reduction in growth of 1.6 per cent.

Bertocchi and Guerzoni (2010) use data for 28 Sub-Saharan African countries during the period 1999–2004 and consider as fragile states the countries belonging to the bottom two quintiles of the Country Policy and Institutional Assessment (CPIA) rating, or unrated. After applying both pooled OLS and Two-Stage Least Squares (2SLS), they conclude that there is no significant impact of fragility on economic growth. However, when restricting the list of fragile states to those countries belonging to the bottom quintile of the CPIA rating or unrated, the results show a clear, negative impact.

Despite the profusion of studies examining the effect on growth of related factors – such as corruption, institutional quality, or state capacity, among others – to the best of the author's knowledge, these are the only studies that focus explicitly on the examination of the link between state fragility *per se* and economic growth in the context of cross-country regressions.[2] This paper contributes to this literature by using an alternative measure of fragility that is not based on the CPIA and considering the two dimensions separately.

By focusing on the impact of state ineffectiveness and political violence on economic growth, this paper also contributes to different strands of studies within the growth literature. The first contribution is towards the group of studies rooted in the idea that different rates of economic growth can be explained by differences in state capacity and the level of institutions. The second is the line of argument that examines the impact of different dimensions of political violence on growth rates. I refer to Maier (2010) for a more comprehensive review, but for the sake of completeness, I also provide a brief overview in the following paragraphs.

2.1 Effect of state capacity and institutions on growth

Over the last decades, there has been an increasing focus on governance and a tendency towards assessing its level by using the lenses of the state, and underlining the importance of state capacity as an essential feature for effective governance (Savoia and Sen 2015). Due to its multidimensionality, state capacity has been conceptualized and measured in a variety of ways, and different authors have focused on different mechanisms through which the state affects development outcomes (Savoia and Sen 2015: 442).[3]

Evans and Rauch (1999) find a strong association between 'Weberianness' and economic growth in 35 emerging economies for the period 1970–90. Their 'Weberianness Scale' is a measure of the degree to which meritocratic recruitment and the offer of predictable, rewarding long-term careers characterizes core state agencies (Evans and Rauch 1999: 749). The results in Bockstette et al.

[2] Even though Chauvet et al.s (2007) work refers to failing states, their definition is close to that of fragile states.

[3] I refer to Cingolani (2013) for a comprehensive overview.

(2002) show a positive association between state antiquity and economic growth for 94 countries over the period 1960–95.

Another line of work uses measures of institutional quality in the empirical analysis. Focusing on the period 1974–89, Knack and Keefer (1995) found that institutions that protect property rights are crucial for investment and growth. Extending the period until 2000 and using three alternative measures for the level of corruption, including the International Country Risk Guide (ICRG) index, Mendez and Sepulveda (2006) concluded that there is a non-linear relationship between corruption and growth, with corruption being favourable at low levels of incidence and harmful to economic growth at high levels of incidence. Bosworth and Collins (2003) argue that a part of the cross-country variation in economic growth over the period 1960–2000 can be explained by the quality of the governing institutions (e.g. law and order, absence of corruption, and protection of property rights).[4]

Some authors have started to unpack the concept of state capacity by distinguishing between different components (see Bardhan 2016, for an overview). For instance, using different indicators of governance from the World Bank's Worldwide Governance Indicators database, but focusing on the impact of regulatory quality, Jalilian et al. (2007) suggest that there is a strong causal link between this dimension and growth.[5]

2.2 Effect of political violence on growth

Parallel to this literature, a large number of papers have examined the significance of political variables in growth regressions.[6] Some authors have tested the relationship between repression or its opposite, political freedom, on economic growth. An early study by Chen and Feng (1996) reports that the analysis of cross-sectional data for 88 countries for the period 1974–90 confirms the expected negative effect of government repression on economic growth. Considering the period 1975–2004, and using data for about 100 countries, Chauffour (2011) found a positive effect of civic and political rights on economic growth.

Focusing on the growth effect of civil wars[7], Collier (1999) observed that, when considering all civil wars during the period 1960–92, the results indicate a decline of income per capita at an annual rate of 2.2 per cent during civil wars in comparison to its counterfactual. This is in line with previous work that has found the link between civil war incidence and economic growth to be negative (e.g. Barro 1991). More recently, the results obtained by Murdoch and Sandler (2004) show that in the short-run (5-year period), per capita real income growth is predicted to be 0.05 percentage points less if there is a civil war in the country during that period. Bodea and Elbadawi (2008) concur to the view that political violence, and particularly civil war, has a significant negative effect on growth. Although Biswas et al. (2016) fail to find a significant effect of ethnic civil war on income growth over the period 1975–2005, the negative contemporaneous impact of non-ethnic war is significant.

However, other work focusing on the long-run impact points to the opposite effect. Organski and Kugler (1977) find that 15–20 years after the war its effects have dissipated and countries recover

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[4] The connection with the literature on 'good governance' is also apparent, but will not be explored here.

[5] More tangentially, this paper also relates to the work testing the link between institutions factors and economic growth in the long-run. I refer to Nunn (2009) for an overview of this research.

[6] I refer to Carmignani (2003) for a more complete overview. It is important to highlight that the studies discussed here explore the variation across countries, but in most cases employ panel data methods.

[7] I refer to Bove et al. (2017) for a more detailed literature review.

the level of pre-war performance, a phenomenon that authors label as the 'phoenix factor'. More recently, also using cross-sectional data, but extending the period until 2001, Cerra and Saxena (2008: 442) show evidence of a partial rebound of output following a civil war. Still, some authors also fail to find any significant effect (e.g. Aisen and Veiga 2013; Jong-A-Pin 2009).

The literature focusing specifically on coups d'état is scarcer. Using data for 121 countries over the period 1950–82, Londregan and Poole (1990) failed to find evidence of a significant effect of either the recent history of coups or the current propensity for a coup d'état. In contrast, Fosu (2002) found an adverse effect of coup events in Sub-Saharan African countries over the 1960–86 period.

Overall, existing studies seem to indicate that there is a positive (negative) effect of state effectiveness (ineffectiveness) on growth. In the case of political violence, the literature suggests that considering different dimensions and time periods may point to divergent effects. Thus, the overall impact may be less clear.

3 Conceptualizing and measuring state fragility

Despite the mounting number of analytical tools that have appeared in response to the demand for orientation on how to deal with fragile states, the concept remains obscure and the quantification efforts have been subjected to criticism. It has been argued that, in most cases, there is a lack of definitional clarity, often resulting from weak theoretical foundations, alongside some methodological limitations in their construction (Ferreira 2017). The proposal in this paper follows the line of recent work taking multidimensionality into account (e.g. Gravingholt et al. 2015). However, it departs from these approaches in that it considers state ineffectiveness and political violence as the two dimensions of fragility and measures them separately using principal components analysis (PCA).

3.1 Concept

The definition of state fragility starts by considering the role of the state in society. I adopt a political economy view, which is centred on the core functions of the state and aligned with the post-Washington Consensus view of economic development (Stiglitz 2002). According to this perspective, and following the list of 'minimal' functions advanced in World Bank (1997: 27), it is argued that, in order to promote development, the state must provide a set of public goods and protect the poor.

This normative standpoint is then complemented with positive considerations about the actual role of the state. These are derived from Besley and Persson's (2011) theoretical model, according to which a peaceful state with high levels of state capacity will emerge if institutions are sufficiently cohesive and there is a common interest in providing public goods. However, if this is not the case, two pathologies of the state can emerge. Either there is: i) 'state ineffectiveness in enforcing contracts, protecting property, providing public goods and raising revenues'; or there is ii) 'political violence either in the form of repression or civil conflict'; or even iii) both pathologies are present at the same time (Besley and Persson 2011: 373). This paper considers that there is state fragility when the country exhibits one or both of these symptoms; and the higher their level, the greater will be the degree of state fragility.

3.2 Measure

The indicators listed in Table 1 were chosen to represent cues that reveal the presence of the two symptoms, subject to data availability (further details about their sources are described in the Appendix, Table A).

PCA is a procedure to reduce a set of highly correlated variables into a smaller number of components, which are orthogonal to each other. The state ineffectiveness index was obtained by applying PCA to the set of variables representing state effectiveness, and then multiplying the resulting scores for the first principal component by -1, in order to transform this variable into a measure of state ineffectiveness. Similarly, the political violence index results from the application of PCA to the set of variables describing political violence. The dataset included data for all the countries available over the period 1993–2012, and PCA provided a score on state ineffectiveness for 158 countries, and on political violence for 166 countries[8].

The same method was used to derive two versions of a unidimensional index of state fragility. The first results from the first principal component obtained from applying PCA to the aforementioned indices of state ineffectiveness and political violence (version 1). The second is the first principal component obtained from applying PCA to all of the indicators listed in Table 1 (version 2).

Table 1. Variables used in the construction of the indices

Symptom	Elements	Proxies
State ineffectiveness	Contract enforcement	Rule of law Regulatory quality Independence of judiciary Control of corruption
	Protection of property	Property rights enforcement
	Public goods provision	Government effectiveness Public health expenditure Access to improved water
	Authority	Failure of state authority
Political violence	Repression	Physical integrity Empowerment rights Political terror scale
	Civil conflict	Major episodes of civil violence Armed conflict Coups d'état Revolutionary wars Ethnic wars

Source: Author's construction.

4 Empirical model and data

The tradition of using cross-country regressions to examine economic growth and its determinants has been established since the early studies towards the end of the 1980s and the beginning of the 1990s. The use of growth regressions in development economics stems from the interest in understanding the underlying factors that explain the differences in the economic performance of

[8] See Figures A and B in the Appendix for more details on the distribution of these scores in each of the periods considered.

countries. This has led to a plethora of studies examining different growth determinants.[9] The empirical basis used here is largely in line with this literature and can be represented as follows:

$$g_i = \alpha + \beta \log y_{i,0} + \delta X_i + \varepsilon_i \tag{1}$$

where i indexes countries, g_i is per capita real Gross Domestic Product (GDP) growth, α is a constant, $\log y_{i,0}$ is the logarithm of the initial level of per capital real GDP, and ε_i represents the error term. X_i includes covariates, which can vary greatly from paper to paper, given that growth theory does not provide a definite list for these determinants. In the face of this challenge, recent studies include their variable of interest and use the results from previous empirical studies as a guideline for the choice of control variables.

In order to test whether there is an effect of state fragility on growth, and in line with the multidimensional approach proposed in this paper, I add to this formulation a term to capture state ineffectiveness and another to capture political violence. These are represented in equation (2) by si_i and pv_i, respectively. Their corresponding coefficients, γ_1 and γ_2, measure how growth is affected by each of these dimensions. Bearing in mind that higher levels of state ineffectiveness and of political violence are interpreted as higher levels of state fragility, and according to the postulate that higher levels of fragility have a detrimental effect on growth, the expectation is that they have a negative sign.

$$g_i = \alpha + \beta \log y_{i,0} + \gamma_1 si_i + \gamma_2 pv_i + \delta X_i + \varepsilon_i \tag{2}$$

The matrix of the state resulting from Besley and Persson's (2011) model identifies different types of states, resulting from the combination of the two symptoms. For instance, the economic performance of a weak state at peace is likely to be different from that of a repressive, but effective state. Inspired by this, I introduce an interaction term between state ineffectiveness and political violence in equation (3). Thus, γ_3 allows one to examine whether the effect of state ineffectiveness, or political violence, on growth is different for different values of political violence, or state ineffectiveness.

$$g_i = \alpha + \beta \log y_{i,0} + \gamma_1 si_i + \gamma_2 pv_i + \gamma_3 si_i \times pv_i + \delta X_i + \varepsilon_i \tag{3}$$

When compared to the studies testing the effect of state fragility on growth reviewed in the previous section, this approach differs by using two distinct indices to proxy for the dimensions of state fragility separately, and by employing a continuous measure of state fragility rather than a dummy for whether a country is fragile.

Given that the annual scores for the index of state ineffectiveness are available only from 1996, and in order to maximize the use of the data available, the estimations in this paper were carried out considering the period 1993–2012. The first set of results was obtained with cross-country data for one 20-year horizon (1993–2012) and two 10-year horizons (1993–2002 and 2003–12); panel data considering 5-year averages (starting in period 1993–97) and 10-year averages (starting in period 1993–2002) were used later in the analysis.

Following the standard practice in the literature, the average of the annual growth rate of real GDP is used as dependent variable. State ineffectiveness and political violence are measured using the two indices described above. As mentioned before, there is no definite list of growth determinants.

[9] I refer to Maier (2010) for a review of growth models and economic explanations for underdevelopment in the context of fragile states.

Inspired by some influential work by Bosworth and Collins' (2003) and Sala-i-Martin et al.'s (2004), the following were chosen as control variables: initial level of per capita GDP; education; change and variability of the terms of trade; measure of geography; inflation; budget balance; trade policy. In addition to these, regional dummies were included for Sub-Saharan Africa, East Asia, and Latin America, as well as time dummies in the case of panel regressions. The samples of countries are listed in Table B in the Appendix whereas Table C includes the full details of the sources and construction of the variables. Tables D and E show the descriptive statistics for the datasets used.[10]

5 Results analysis

5.1 Initial results

State ineffectiveness and political violence

I begin the analysis with the regressions estimated with OLS. The cross-country results are represented in Table 2. Columns with odd numbers were obtained with the specification in equation (2), whereas even numbered columns result from adding the interaction between state ineffectiveness and political violence, in order to estimate equation (3).

Focusing on the variables of interest, state ineffectiveness has a negative and significant effect on economic growth in all specifications. This is in line with the conclusions from previous related work (as discussed in section 2). For instance, for period 1993–2012, column (1), the estimated coefficient suggests that, if the position of a country in terms of state ineffectiveness moves from the 25th percentile to the 75th percentile, the state ineffectiveness index would rise by approximately 3.19, from -1.28 to 1.91. If it did rise by this amount, then growth would fall by almost 1 percentage point. In contrast with the intuition from theory, the coefficient for political violence reveals a positive and significant effect in two of the periods considered.

[10] The pairwise correlations between the variables and an analysis of the variance inflation factors (Kennedy 2008: 199) did not show any reasons for concern about the potential for multicollinearity.

Table 2. Cross-country OLS estimations

	Dependent variable: real GDP per capita growth					
	20-year		10-year			
	1993-2012		1993-2002		2003-2012	
	(1)	(2)	(3)	(4)	(5)	(6)
Initial pc GDP, log	-1.410***	-1.437***	-1.221***	-1.228***	-1.484***	-1.532***
	(0.258)	(0.244)	(0.285)	(0.277)	(0.226)	(0.210)
Education	0.0314*	0.0300	0.0185	0.0176	0.0451**	0.0437**
	(0.0187)	(0.0188)	(0.0151)	(0.0151)	(0.0182)	(0.0179)
Terms of trade growth	0.00530	0.00531	-0.112*	-0.109*	0.00331	0.00371
	(0.00536)	(0.00530)	(0.0660)	(0.0648)	(0.00585)	(0.00573)
St. dev. terms of trade	0.00387	0.00479	0.0399	0.0447	0.0171	0.0143
	(0.00990)	(0.00986)	(0.0399)	(0.0369)	(0.0145)	(0.0140)
Geography	0.231	0.234	-0.0326	-0.0113	-0.236	-0.193
	(0.260)	(0.257)	(0.288)	(0.290)	(0.236)	(0.228)
Initial inflation	-0.557	-0.473	-0.287	-0.326	19.93***	21.31***
	(0.467)	(0.479)	(0.448)	(0.470)	(4.108)	(4.215)
Initial budget balance	0.0674	0.0638	0.0551	0.0470	0.0967**	0.107***
	(0.0421)	(0.0419)	(0.0464)	(0.0473)	(0.0368)	(0.0351)
Initial trade policy	0.236	0.153	1.080**	0.971**	0.155	-0.110
	(0.514)	(0.538)	(0.465)	(0.475)	(0.563)	(0.518)
Sub-Saharan Africa	-1.279***	-1.316***	-2.558***	-2.551***	-1.187**	-1.198**
	(0.477)	(0.462)	(0.685)	(0.687)	(0.542)	(0.494)
East Asia	1.127	1.204*	0.404	0.478	1.063**	1.218***
	(0.724)	(0.685)	(0.806)	(0.831)	(0.426)	(0.405)
Latin America	0.272	0.241	-1.227**	-1.223**	-0.125	-0.164
	(0.440)	(0.441)	(0.558)	(0.558)	(0.534)	(0.530)
State ineffectiveness (SI)	-0.303***	-0.344**	-0.382***	-0.416***	-0.375***	-0.446***
	(0.110)	(0.146)	(0.144)	(0.145)	(0.118)	(0.106)
Political violence (PV)	0.183*	0.186*	-0.0999	-0.102	0.280***	0.302***
	(0.0980)	(0.0968)	(0.113)	(0.113)	(0.0907)	(0.0789)
SI x PV		-0.0275		-0.0282		-0.0579
		(0.0782)		(0.0844)		(0.0406)
Constant	13.88***	14.24***	11.83***	12.01***	13.08***	13.86***
	(2.387)	(2.272)	(2.598)	(2.452)	(2.050)	(1.941)
Observations	92	92	87	87	80	80
R^2	0.456	0.459	0.456	0.458	0.663	0.675
Adj. R^2	0.365	0.361	0.359	0.352	0.597	0.606

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculation based on the data described in the Appendix.

The results in columns (2), (4), and (6) do not suggest that there is a significant interactive effect between state ineffectiveness and political violence. The magnitude of the coefficients is similar across specifications and they all exhibit a negative sign, but none is significant. Additionally, the overall conclusions for the main variables of interest are maintained when the interaction term is included.

I turn now to the evidence obtained using panel data, considering the 5-year and 10-year averages, represented in Table 3, columns (1)–(4). Starting with the 5-year averaged data, the expected negative effect of state ineffectiveness persists when panel data are considered. However, it loses significance after the inclusion of the interaction term. The coefficient obtained for political violence is positive, but small in magnitude and not significant, and again the result for the interaction term does not lend support to the existence of an interactive effect of these two variables on growth.

Considering the 10-year averaged data, the adverse effect of state ineffectiveness holds when this data structure is considered, and also when the interaction term is added. The coefficient for political violence remains roughly the same, with a small reduction in magnitude, but still non-significant. The inclusion of the state ineffectiveness x political violence term does not cause major

variations to the coefficients of the two variables, and despite the change in sign, it remains small in magnitude and non-significant.

Table 3. Panel OLS and FE estimations

	Dependent variable: real GDP per capita growth							
	OLS estimates				*FE estimates*			
	5-year averages		10-year averages		5-year averages		10-year averages	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
In. pc GDP, log	-1.226***	-1.187***	-1.572***	-1.577***	-8.273***	-8.517***	-6.408***	-6.546***
	(0.327)	(0.322)	(0.235)	(0.221)	(2.560)	(2.555)	(1.112)	(1.141)
Education	0.0407**	0.0428**	0.0375***	0.0372***	0.0100	0.00357	-0.0287	-0.0310
	(0.0176)	(0.0174)	(0.0143)	(0.0141)	(0.0391)	(0.0392)	(0.0278)	(0.0268)
Terms trade gr.	0.00317	0.00281	-0.00233	-0.00224	-0.00484	-0.00674	-0.000116	-0.000498
	(0.0162)	(0.0163)	(0.00828)	(0.00821)	(0.0102)	(0.00969)	(0.00590)	(0.00600)
Geography	0.127	0.107	-0.146	-0.141				
	(0.240)	(0.249)	(0.219)	(0.222)				
Inflation	1.138**	1.078**	0.189	0.183	0.916***	0.912***	-1.224*	-1.120*
	(0.522)	(0.441)	(0.528)	(0.547)	(0.283)	(0.277)	(0.694)	(0.674)
Budget balance	0.130***	0.125***	0.124***	0.124***	0.0927	0.0923	0.0358	0.0374
	(0.0462)	(0.0475)	(0.0366)	(0.0364)	(0.0789)	(0.0727)	(0.0554)	(0.0555)
Trade policy	-0.407	-0.253	0.0648	0.0260	-0.589	-0.689	-1.179	-1.257
	(0.734)	(0.690)	(0.538)	(0.468)	(1.165)	(1.110)	(0.931)	(0.887)
SSA	-1.929***	-1.887***	-2.158***	-2.157***				
	(0.538)	(0.548)	(0.569)	(0.569)				
East Asia	0.912	0.826	0.686	0.703				
	(0.651)	(0.583)	(0.575)	(0.520)				
Latin America	-0.457	-0.429	-0.501	-0.502				
	(0.406)	(0.418)	(0.402)	(0.403)				
State ineff. (SI)	-0.238*	-0.190	-0.322***	-0.331***	-0.403	-0.585	0.767	0.698
	(0.126)	(0.145)	(0.0990)	(0.105)	(0.623)	(0.654)	(0.514)	(0.533)
Pol. viol. (PV)	0.0754	0.0689	0.0545	0.0560	-0.0771	-0.156	-0.206	-0.276
	(0.106)	(0.106)	(0.0977)	(0.0933)	(0.291)	(0.286)	(0.319)	(0.365)
SI x PV		0.0407		-0.00741		0.182		0.0808
		(0.0700)		(0.0697)		(0.144)		(0.149)
Constant	13.05***	12.05***	16.04***	16.14***	75.96***	77.81***	61.35***	62.37***
	(3.102)	(3.046)	(2.384)	(2.099)	(22.50)	(22.44)	(10.04)	(10.24)
Observations	198	198	167	167	228	228	197	197
R^2	0.325	0.328	0.322	0.322	0.395	0.404	0.518	0.521
Adj. R^2	0.273	0.273	0.264	0.260	0.367	0.374	0.495	0.495

Notes: Cluster robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time dummies also included in the regressions.

Source: Author's calculation based on the data described in the Appendix.

Given that using a panel structure allows one to account for individual heterogeneity, I explore this possibility further. The Breusch and Pagan Lagrange multiplier test (Breusch and Pagan 1980) provided support for this decision when applied to the 5-year averages dataset. The F-test that the observed and unobserved fixed effects are equal to zero indicated that one rejects the null hypothesis, suggesting the use of the fixed effects estimator. Additionally, the result of the Hausman test, frequently used to compare fixed effects and random effects, led to the rejection of the null hypothesis that the estimated coefficient with random effects is efficient, thus, deeming fixed effects as the preferred model.

In light of this, I estimated the coefficients with fixed-effects (FE) methods, presented in columns (5)–(8) in Table 3. They show a loss of significance of the negative coefficient for state ineffectiveness, whereas the coefficient for political violence and the interaction term remain non-significant in any of the specifications. Still, these results should be regarded with caution. FE

estimators are useful when one wants to analyse the impact of variables that vary over time, but a recognized problem in the literature is that they will not be appropriate for variables that change slowly over time. In fact, the limited time variation of state ineffectiveness and political violence may be the reason for the lack of a significant effect for these two indices. [11]

Unidimensional index of state fragility

In order to test the claim in this paper that it is important to consider the two indices separately, I compare the results above with those obtained with a single index of state fragility. This is explored by using the two versions described in section 3 to replace state ineffectiveness and political violence in the growth regression. The results for cross-section and panel data are reported in Table 4. For brevity, I include only the coefficients obtained for the two indices.

Table 4. Cross-country and panel OLS estimations with a single index of state fragility

	Dependent variable: real GDP per capita growth									
	CROSS-COUNTRY DATA						PANEL DATA			
	20-year 1993-2012		10-year 1993-2002		10-year 2003-2012		5-year averages		10-year averages	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Version 1	-0.00254		-0.567***		0.0731		-0.0335		-0.253	
	(0.193)		(0.205)		(0.215)		(0.219)		(0.183)	
Version 2		-0.106		-0.353***		-0.0971		-0.102		-0.203**
		(0.0857)		(0.0980)		(0.0983)		(0.107)		(0.0835)
Obs.	92	92	87	87	80	80	198	198	167	167
R^2	0.401	0.409	0.443	0.460	0.599	0.603	0.312	0.315	0.296	0.308
Adj. R^2	0.311	0.320	0.353	0.372	0.527	0.532	0.263	0.267	0.241	0.254

Notes: The control variables are the same as in Tables 2 and 3. Robust and cluster robust standard errors in parentheses for cross-country and panel estimates, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculation based on the data described in the Appendix.

The results concur to the argument that, by considering a single index of state fragility, one may be overlooking the effect of different aspects of this phenomenon. With the exception of the 10-year period between 1993 and 2002, the coefficients for neither of the state fragility indices show a significant effect on economic growth. When considering panel data, only one of the obtained coefficients for each version of the index shows a significant impact of state fragility.

5.2 Robustness checks

In order to test the robustness of the results obtained before, a few additional estimations were performed. First, I consider the potential influence of certain observations on the obtained results. The results from a preliminary analysis of potential outliers[12] called for closer scrutiny of the influence of the following observations in the case of cross-country data: i) Israel, Colombia, India and Dem. Rep. Congo for period 1993–2012; ii) India and Brazil for period 1993–2002; and iii) Colombia, India, Algeria, Russia and Venezuela for period 2003–12. For panel data, the methods identified as potential outliers the observations for: i) Myanmar in 2003–07 and Brazil in 1993–97 with 5-year averaged data; and ii) Burundi and Brazil in period 1993–2002 with 10-year averages.

[11] An analysis of the variation of these variables over time indicated that most variation is explained by differences between rather than within countries.

[12] I adopted the Hadi (1992) procedure for identifying multiple outliers as implemented by Roodman (2007). Additionally, I considered the potential outliers in terms of growth rates by using a graphical procedure that consists in the observation of a leverage-versus-squared-residual plot. I consider 0.4 as the threshold level for leverage values.

The results are not reported here for reasons of space, but they showed similar coefficients for state ineffectiveness, with a significant effect in almost all specifications. The coefficient for political violence lost significance when cross-country data was used and remained positive and non-significant with panel data. Finally, the results for the interaction term between the two variables remained roughly the same.

As mentioned in section 4, there is no definite list of controls, and different authors use different sets of explanatory variables. In order to account for the possible changes resulting from using other covariates, I ran an additional set of regressions adding the following three covariates, which can be frequently found, for instance, in the literature examining the link between aid and growth (e.g. Rajan and Subramanian 2008): the M2 as a ratio of GDP as a proxy for the level of depth of the financial system; the average number of revolutions; and an indicator of ethnic fractionalization.[13]

The results for state ineffectiveness were similar to those obtained before for both cross-country and panel data. There was some variation in the sign and significance level of the coefficient for political violence, suggesting that, as observed before, the results change with the specification considered. The interaction term between state ineffectiveness and political violence remained non-significant.

The final possibility addressed in this section is related to the fact that the dimensions captured by the state ineffectiveness index are similar to those usually included in measures of institutional quality. A preliminary analysis performed to ascertain the potential for multicollinearity[14] showed that the state ineffectiveness index is highly correlated with the ICRG indicator of quality of government, which is frequently used as an indicator of the quality of institutions in a country. The results in Table 5 include, first, the coefficients estimated for the main variables of interest when both the ICRG and the state ineffectiveness index are included in the analysis, and then the results obtained when the ICRG replaces the state ineffectiveness index.

Table 5. Cross-country and panel OLS estimations with ICRG

	Dependent variable: real GDP per capita growth									
	CROSS-COUNTRY DATA						PANEL DATA			
	20-year 1993-2012		10-year 1993-2002		10-year 2003-2012		5-year averages		10-year averages	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICRG	-0.0361	3.377**	2.068	4.010***	-0.964	2.160*	-0.224	1.935	0.610	2.276**
	(1.829)	(1.436)	(2.150)	(1.510)	(2.852)	(1.106)	(1.600)	(1.289)	(1.632)	(1.140)
State inef.	-0.363**		-0.377**		-0.392		-0.313*		-0.307**	
	(0.138)		(0.184)		(0.292)		(0.161)		(0.142)	
Pol. viol.	0.198**	0.164*	-0.0201	-0.0618	0.281***	0.233**	0.119	0.0322	0.124	0.113
	(0.0937)	(0.0924)	(0.0896)	(0.0977)	(0.0957)	(0.101)	(0.109)	(0.115)	(0.0818)	(0.0866)
Obs.	85	87	80	83	75	76	186	193	155	159
R^2	0.516	0.505	0.529	0.604	0.682	0.661	0.368	0.343	0.379	0.427
Adj. R^2	0.420	0.417	0.427	0.529	0.608	0.590	0.312	0.292	0.317	0.376

Notes: The control variables are the same as in Tables 2 and 3. Robust and cluster robust standard errors in parentheses for cross-country and panel estimates, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculation based on the data described in the Appendix.

[13] The multicollinearity analysis was repeated for the new set of variables and no concerns were raised.

[14] As described earlier, this considered the pairwise correlations between the variables and the variance inflation factors (Kennedy 2008: 199).

When considering cross-country data, with the exception of the period 2003–12, the coefficient for state ineffectiveness remains negative and significant, which suggests that the obtained results are robust even when controlling for the quality of institutions in the country. However, even if not significant in any of the regressions with the two indices, the coefficient for ICRG shows a significant positive effect when the state ineffectiveness index is dropped from the analysis. Turning now to panel data, again state ineffectiveness remains negative and significant after the inclusion of ICRG. Similar to before, when state ineffectiveness is not included, the coefficient for the ICRG index is positive, though significant only with the dataset with 10-year averages.[15]

5.3 Addressing endogeneity

Given the nature of the two variables used to proxy for state fragility, there is a risk that the use of OLS methods leads to biased regressors for two main reasons. The first is the potential for omitted variables. For instance, it is possible that state ineffectiveness and growth respond simultaneously to an omitted factor, such as the historical evolution of the nation in question (Mendez and Sepulveda 2006), which would, however, be hard to control for, given the challenges of finding an appropriate indicator and the limitations in terms of data availability.

The second reason is that, while the interest in this paper is to test whether state fragility affects economic growth, as pointed out by Bertocchi and Guerzoni (2010), it is plausible to assume that the causality runs in the opposite direction, i.e. from growth to state fragility. For instance, it could be the case that countries with higher rates of economic growth have more resources to fight against and control corruption (Mendez and Sepulveda 2006: 91). It is also more likely that richer economies choose strong fiscal systems, or they have, at least, the ability to do so (Dincecco and Prado 2012: 172). Also, income levels and income growth have been explored at length in the literature examining the causes of conflict (see, for instance, Blattman and Miguel 2010 or Humphreys 2003), with some authors finding a significant relationship between the two (e.g. Collier and Hoeffler 2004; Miguel et al. 2004).

In light of these issues, the following paragraphs present the results from exploring a series of strategies for overcoming the potential endogeneity of state ineffectiveness and political violence separately. The interaction term between state ineffectiveness and political violence poses additional challenges in terms of finding an appropriate instrument. Thus, in order to simplify the analysis, this term is not included in the discussion that follows.

The estimates represented in Table 6 were obtained after applying instrumental variable (IV) procedures in order to address the potential endogeneity of state ineffectiveness. Three alternatives were considered to instrument for state ineffectiveness. First, I use the time-invariant variable representing the logarithm of the settler mortality estimates provided by Acemoglu et al. (2001). According to these authors, the diseases that potential European settlers faced in the colonies (mostly malaria and yellow fever) influenced the patterns of settlement and the type of institutions that were put in place, but did not have a major effect on the health and economy of indigenous people. The estimated coefficients correspond to Results A. One observes that the coefficient for state ineffectiveness maintains its negative sign, but it is not significant in any of the datasets considered. Political violence shows a positive coefficient, which is significant only when the 20-

[15] The argument for the disintegration of state fragility proposed here was taken to the extreme by including all the variables used in the construction of each index as separate regressors. The obtained coefficients (which can be obtained from the author upon request) are preliminary, thus I simply highlight that public expenditure in health, failure of state authority and coups d'état were the only variables showing a significant effect in more than one specification.

year period is used. Still, the results for some of the standard tests for instrument strength, namely the p-value of the Kleibergen-Paap Lagrange-Multiplier (LM) statistic and the first-stage F-statistic (Staiger and Stock 1997) indicate that the logarithm of settler mortality is not a strong instrument for the purposes of this analysis.

Secondly, I employ Hall and Jones' (1999) list of instruments. The first is a time-invariant variable representing the distance to the equator, obtained by taking the absolute value of latitude in degrees and dividing it by 90 to obtain a 0–1 scale. The authors argue that at the start of the fifteenth century Western Europeans were more likely to move and settle in regions that were sparsely populated and with a similar climate to Western Europe, and these criteria suggest regions far from the equator. I also include the fraction of a country's population speaking one of the five primary Western European languages (English, French, German, Portuguese, and Spanish) as a mother tongue in the present (considering 1999 as the present), which, according to the authors, will be correlated with the extent of Western European influence. The percentage of the population speaking English as a mother tongue is also included in order to allow for the potential of a separate impact. The fourth variable is Frankel and Romer's (1996) log of predicted trade share.

Table 6. Cross-country and panel IV estimations with instruments for state ineffectiveness

	Dependent variable: real GDP per capita growth				
	CROSS-COUNTRY DATA			PANEL DATA	
	Results A: Log(settler mortality)				
	1993-2012	1993-2002	2003-2012	5-year averages	10-year averages
	(1)	(2)	(3)	(4)	(5)
State ineffectiveness	-0.195	-0.810	-0.907	-1.124	-0.840
	(0.931)	(0.574)	(0.903)	(0.804)	(0.687)
Political violence	0.297***	0.0245	0.365	0.249	0.212
	(0.113)	(0.135)	(0.239)	(0.155)	(0.203)
Observations	58	55	48	136	103
R^2	0.531	0.553	0.576	0.361	0.428
p-value LM stat	0.0906	0.0157	0.171	0.0339	0.0185
F-stat weak ident.	2.401	5.340	1.669	4.465	5.412
	Results B: Dist. equator; Eur. language; English language; FR trade share				
	1993-2012	1993-2002	2003-2012	5-year averages	10-year averages
	(1)	(2)	(3)	(4)	(5)
State ineffectiveness	-0.451*	-0.796**	-0.000448	-0.631*	-0.525
	(0.272)	(0.395)	(0.264)	(0.380)	(0.323)
Political violence	0.194*	-0.0358	0.178	0.0777	0.0707
	(0.0998)	(0.103)	(0.119)	(0.102)	(0.106)
Observations	91	86	79	196	165
R^2	0.450	0.393	0.614	0.295	0.320
p-value LM stat	0.000141	0.000506	0.00341	0.000447	0.000335
F-stat weak ident.	8.632	8.296	7.235	9.348	10.38
	Results C: Dist. equator; European language				
	1993-2012	1993-2002	2003-2012	5-year averages	10-year averages
	(1)	(2)	(3)	(4)	(5)
State ineffectiveness	-0.488*	-0.774**	-0.135	-0.557	-0.591**
	(0.268)	(0.371)	(0.242)	(0.364)	(0.301)
Political violence	0.199**	-0.0385	0.204*	0.0713	0.0810
	(0.100)	(0.101)	(0.109)	(0.102)	(0.103)
Observations	91	86	79	196	165
R^2	0.445	0.398	0.644	0.304	0.311
p-value LM stat	1.75e-05	0.000123	0.000503	7.72e-05	6.61e-05
F-stat weak ident.	15.22	11.88	11.50	12.97	13.77

Notes: The controls are the same as in Tables 2 and 3. Robust and cluster robust standard errors in parentheses for cross-country and panel estimates, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculation based on the data described in the Appendix.

Results B show the obtained coefficients. They indicate that the negative effect of state ineffectiveness on growth holds again in all periods, and it is now significant in two of the periods with cross-country data and for the panel dataset obtained with 5-year averages. The term for political violence is positive and significant with period 1993–2012, but the sign changes and it is non-significant for the remaining periods, which suggests that the result is not robust across specifications. This instrumentation strategy is stronger than the one previously described. It passes the overidentification test, although the value for the F-test is still below the threshold level considered to rule out instrumentation weakness in most specifications.

Thirdly, based on the significance levels of the four variables used as instruments in the first-stage regressions (not presented here for space reasons), I dropped the fraction of the population speaking English and the measure of trade share, and kept only the distance to the equator and the fraction of the population speaking a European language as exogenous instruments. The estimated coefficients are represented by Results C and are similar to the ones obtained with the four instruments. State ineffectiveness holds a negative coefficient in all specifications, but it is significant only when cross-country data for the 20-year period and for the decade 1993–2002 are used and for the panel dataset obtained with 10-year averages. The sign and significance level of the coefficient for political violence once again vary with the period considered, and it is positive and significant in only two out of the five specifications. This instrumentation strategy passes both tests of instrument weakness in all specifications, as shown in the last two rows of the table, which suggests an improvement in terms of the strength of the instrument.[16]

Finding an appropriate instrument for political violence is equally challenging, leading some authors to prefer the use of GMM methods (e.g. Biswas et al. 2016; Bodea and Elbadawi 2008). However, given the limitations of these methods[17], I opt for exploring two different approaches here. The first strategy consisted in using the initial value of political violence in the regressions. Overall, the coefficients obtained (Table 7, Results A) do not show significant differences in terms of the signs and significance levels for the two variables of interest. In fact, one still observes a positive coefficient for political violence in most cases, but it is only significant in two of the five specifications. The significant negative effect of state ineffectiveness remains in all regressions.

Table 7. Cross-country and panel OLS estimations with initial level of political violence and IV estimates with food prices as instrument

	Dependent variable: real GDP per capita growth				
	CROSS-COUNTRY DATA			PANEL DATA	
	Results A: OLS estimates with initial level of political violence				
	1993-2012	1993-2002	2003-2012	5-year averages	10-year averages
	(1)	(2)	(3)	(4)	(5)
State ineffectiveness	-0.303***	-0.382***	-0.375***	-0.238*	-0.322***
	(0.110)	(0.144)	(0.118)	(0.126)	(0.0990)
Political violence, initial	0.183*	-0.0999	0.280***	0.0754	0.0545
	(0.0980)	(0.113)	(0.0907)	(0.106)	(0.0977)
Observations	92	87	80	198	167
R^2	0.456	0.456	0.663	0.325	0.322
Adj. R^2	0.365	0.359	0.597	0.273	0.264

[16] In an additional attempt to overcome the problem that weak instruments may lead to estimated coefficients that are biased towards OLS, I use Limited Information Maximum Likelihood (LIML) estimation. Following Ricciuti et al. (2016: 25), I use the Fuller's version of LIML and employ the Fuller 4 version (Fuller 1977). In the just identified case, the IV and the LIML estimators are the same. Thus, this strategy was only employed when Hall and Jones' (1999) instruments were used, and when these were restricted. The results are in line with the IV estimations and are available from the author upon request.

[17] See, for instance, Frot and Perrotta (2012).

	Results B: IV estimates with food prices as instrument				
	1993-2012	1993-2002	2003-2012	5-year averages	10-year averages
	(1)	(2)	(3)	(4)	(5)
State ineffectiveness	-0.617**	-0.754**	-0.428**	-0.418	-0.549*
	(0.297)	(0.377)	(0.196)	(0.326)	(0.281)
Political violence	1.325	1.490	0.618	1.047	1.071
	(0.863)	(1.079)	(0.568)	(0.870)	(0.863)
Observations	88	83	78	147	161
R^2	-0.311	-0.728	0.660	-0.076	-0.100
p-value LM stat	0.106	0.101	0.186	0.113	0.152
F-stat weak ident.	2.635	2.374	1.568	2.539	1.944

Notes: The controls are the same as in Tables 2 and 3. Robust and cluster robust standard errors in parentheses for cross-country and panel estimates, respectively. *** p<0.01, ** p<0.05, * p<0.1.

Source: Author's calculation based on the data described in the Appendix.

The second attempt considered a food price index (Food and Agriculture Organization 2016) averaged across the relevant period as an instrument for political violence. This is inspired by the work that finds a positive causal link between rising food prices and social unrest (e.g. Arezki and Bruckner 2011; Bellemare 2014). The results obtained for cross-country and panel data, portrayed in Table 7, Results B, cast serious doubts on the strength of this variable as an instrument. There was a dramatic loss in the explanatory power of the model and the tests for instrument weakness are failed across specifications.

6 Discussion of the results

This section draws together the insights from the results obtained and positions them in relation to the main conclusions found in previous literature. Still, before doing that, it is important to recognize some limitations in the analysis. Firstly, the sample of countries included is reduced when compared to other analyses on fragile states, and the period covered is limited in comparison to previous work using growth regressions. These two limitations are a result of the challenges in terms of data availability. Secondly, the strategies used to minimize the bias resulting from the endogeneity of state ineffectiveness and political violence are far from perfect. Nonetheless, it is my belief that they uncovered some interesting facts.

The estimated coefficients for state ineffectiveness seem unanimous in terms of the sign of the effect, which is significant in most cases. Thus, the results in this paper strongly suggest that countries with higher levels of state ineffectiveness are expected to grow at lower rates. This is in line with the theory described in section 2, which suggests that in general there is a positive link between state capacity and economic growth, and more specifically that the quality of institutions is an important determinant. The indicator for state ineffectiveness comprises different dimensions of the capacity as well as the effectiveness of the state, thus lending support to the view that attributes an important role to the state in the promotion of development.

The conclusion for the effect of political violence is less clear. When cross-country data are used, the sign and significance level of the coefficient seem to vary depending on the period and estimation method applied. With panel data, the positive sign seems more pervasive across specifications, but it is rarely significant. I, therefore, conclude that the model used in this paper fails to find a definite conclusion about the impact of political violence on growth, though the estimated coefficients seem to indicate that there is no causal effect.

Even though, at face value, the latter result seems to be at odds with the intuition, as pointed out in Serneels and Verpoorten (2015), economic theory is not consensual about the effect of conflict on growth. The standard neoclassical growth theory suggests that in the years after civil conflict, an economy could grow relatively fast and converge to its steady state. By contrast, alternative models argue that this catch-up effect could take a long time or that countries may be trapped in a situation with both conflict and dismal performance (Serneels and Verpoorten 2015: 556). Additional, one may think of China and India as examples of countries that may show a positive correlation between levels of political violence and growth rates.

Finally, the coefficients obtained for the interaction term between state ineffectiveness and political violence do not suggest that the effect of state ineffectiveness (or political violence) on economic growth in a country depends on the level of political violence (or state ineffectiveness).

7 Conclusions and implications

This paper presents new evidence on the impact of state fragility on economic growth. Despite existing accounts of the weight that state fragility bears on economic development provided by the reports of development agencies and previous studies, there is a relative scarcity of empirical work on this topic that makes use of cross-country regressions. To the best of the author's knowledge, this is the first analysis which shows that considering the two distinct aspects of state fragility unveils a link between fragility and growth, which is not necessarily visible if a unidimensional index is considered.

Following the tradition in the cross-country growth literature, this paper explores the effect on growth of the two dimensions of state fragility identified in Besley and Persson's (2011) theoretical model – state ineffectiveness and political violence. This is in line with previous literature considering the impact of related aspects, such as institutions, governance, or state capacity, as well as political violence, but aims to fill the gap that still exists in the studies focusing explicitly on the concept of fragile states.

The results from applying OLS to data for period 1993–2012 show a robust negative and significant impact of state ineffectiveness on growth, but no significant effect for political violence. These distinct effects concur to the view that in order to unpack the complexity of state fragility and its effects, one should consider its different dimensions. This was further corroborated by the fact that, when using a unidimensional index of fragility, one failed to find a consistent effect of this variable on growth.

This paper suggests a way forward. One of the main concerns of development agencies is the effectiveness of development assistance—especially in the case of fragile states—as demonstrated in recent reports. The measurement tools for state fragility proposed in this paper provide a new opportunity to examine how different dimensions of state fragility interact with the impact of aid on economic growth.

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Appendix

Table A. List of definitions, measures and data sources for the variables used in the construction of the fragility indices

Symptom	Dimension	Proxy	Definition	Measure	Data source
State ineffectiveness	Contract enforcement	Rule of law	Captures perceptions of the extent to which agents have confidence in and abide by the rules in society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	The aggregate measure ranges from around -2.5 to 2.5, with higher values corresponding to better outcomes.	Worldwide Governance Indicators (World Bank, 2015a)
		Regulatory quality	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	The aggregate measure ranges from around -2.5 to 2.5, with higher values corresponding to better outcomes.	Worldwide Governance Indicators (World Bank, 2015a)
		Enforcing contracts	Measures the efficiency of the judicial system in resolving a commercial dispute.	Represents the number of days to resolve a commercial sale dispute through the courts (in calendar days).	Doing business (World Bank, 2015b)
		Independence of the judiciary	Captures the extent to which the judiciary is independent of control from other sources, such as another branch of the government or the military.	A score of 0 indicates 'not independent', 1 represents 'partially independent', while 2 indicates 'generally independent'.	CIRI (Cingranelli, Richards and Clay, 2014)
		Control of corruption	Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.	The aggregate measure ranges from around -2.5 to 2.5, with higher values corresponding to better outcomes.	Worldwide Governance Indicators (World Bank, 2015a)
	Protection of property	Property rights enforcement	Measures the extent to which a country's legal framework allows individuals to freely accumulate private property, secured by clear laws that are enforced effectively by the government.	The scale is formed by scores ranging from 0 to 100 (0, 10, 20… 100), with the possibility of assigning intermediate scores, such as 75 or 45. Higher scores correspond to a more effective system of legal protection.	Index of Economic Freedom (Miller et al., 2015)
	Public goods provision	Government effectiveness	Captures perceptions of the quality of public services, quality of the civil service and the degree of its independence from political pressures, quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	The aggregate measure ranges from around -2.5 to 2.5, with higher values corresponding to better outcomes.	Worldwide Governance Indicators (World Bank, 2015a)
		Government expenditure on education	General government expenditure (current, capital, and transfers). It includes expenditure funded by transfers from international sources to government. Measured as a percentage of GDP.	Expressed as a percentage of GDP in that year.	World Bank (World Bank, 2016)
		Public health expenditure	Consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Measured as a percentage of GDP.	Expressed as a percentage of GDP in that year.	World Bank (World Bank, 2016)
		Access to improved water	Percentage of the population using an improved drinking water source. The improved drinking water source includes piped water on premises (piped household water connection located inside the	Expressed as a percentage to the total population.	World Bank (World Bank, 2016)

Symptom	Dimension	Proxy	Definition	Measure	Data source
			user's dwelling, plot or yard), and other improved drinking water sources (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection).		
	Raising revenues	Tax revenue	Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. Measured as a percentage of GDP.	Expressed as a percentage of GDP in that year.	World Bank (World Bank, 2016)
	Political authority	Failure of state authority	Refers to situations in which the institutions of the central state are weakened to the point that they can no longer maintain authority or political order in significant parts of the country. Examples of evidence include shut-downs of routine government services, failure of security forces and administrators to carry out any government directives, and anarchic conditions in large parts of the country, with attempts from rival militias, warlords, or local or regional authorities to establish autonomous zones of government,	The scale ranges from 1 (adverse regime change with no significant weakening of state institutions or persistent collapse of public order) to 4 (complete collapse or near-total collapse of public order). A score of 0 was assigned *a posteriori* to periods with no regime change.	Armed Conflict and Intervention, PITF (Marshall, Gurr and Harff, 2015)
Political violence	Repression	Physical integrity	The physical integrity rights index results from the addition of the scores for torture, extrajudicial killing, political imprisonment, and disappearance indicators.	Ranges from 0 (no government respect for these rights) to 8 (full government respect for these rights).	CIRI (Cingranelli, Richards and Clay, 2014)
		Empowerment rights	The empowerment rights index results from the addition of the scores for foreign movement, domestic movement, freedom of speech, freedom of assembly and association, workers' rights, electoral self-determination, and freedom of religion indicators.	Ranges from 0 (no government respect for these rights) to 14 (full government respect for these rights).	CIRI (Cingranelli, Richards and Clay, 2014)
		Political terror scale	Measures the level of political violence that a country experiences in a given year, based on the amount of violations of physical or personal integrity rights carried out by a state (or its agents).	Uses a 5-point coding scheme, with higher levels representing higher levels of 'terror'. Average value of the scores provided by Amnesty International, the U.S. State Department Country Reports on Human Rights Practices, and Human Rights Watch's World Reports.	Political Terror Scale (Gibney et al., 2013)
	Civil conflict	Major episodes of civil violence	Total summed magnitudes of all societal major episodes of political violence involving the state in a certain year, namely episodes of civil violence, of civil warfare, of ethnic violence and of ethnic warfare.	Total summed magnitudes of the four magnitude scores, each scaled from 1 (lowest) to 10 (highest) for each episode. A value of 0 was assigned *a posteriori* to periods with no episodes of civil violence.	Armed Conflict and Intervention, MEPV (Marshall, 2015)
		Armed conflict	Number of armed conflicts defined as contested incompatibilities that concern government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths.	The number of internal and internationalized conflict events was considered, and a value of 0 was assigned *a posteriori* to periods with no armed conflict.	UCDP/PRIO (Gleditsch et al., 2002; Petterson and Wallensteen, 2015)
		Coups d'état	Total sum of successful coups and attempted (but ultimately unsuccessful coups d'état).	Sum of the number of successful coups and of attempted coups d'état that occurred in the year of record. A value of 0 was assigned *a posteriori* to periods with no coups.	Polity IV, Coups d'état (Marshall and Ramsey Marshall, 2015)
		Revolutionary wars	Measures the annual magnitude of episodes of violent conflict between governments and politically organized groups (political	Each of the magnitude scores ranges from 0 to 4. All decimal averages are assigned to decimal	Armed Conflict and Intervention, PITF

Symptom	Dimension	Proxy	Definition	Measure	Data source
			challengers) that seek to overthrow the central government, to replace its leaders, or to seize power in one region. It is based on the average scores of number of rebel combatants or activists, annual number of fatalities related to fighting, and portion of country affected by fighting.	scores of '0.5'. A score of -0.5 was assigned *a posteriori* to periods with no regime change. Higher vales correspond to higher magnitudes.	(Marshall, Gurr and Harff, 2015)
		Ethnic wars	Measures the annual magnitude of episodes of violent conflict between governments and national, ethnic, religious, or other communal minorities (ethnic challengers) in which the challengers seek major changes in their status. It is based on the average scores of number of rebel combatants or activists, annual number of fatalities related to fighting, and portion of country affected by fighting.	Each of the magnitude scores ranges from 0 to 4. All decimal averages are assigned to decimal scores of '0.5'. A score of -0.5 was assigned *a posteriori* to periods with no regime change. Higher vales correspond to higher magnitudes.	Armed Conflict and Intervention, PITF (Marshall, Gurr and Harff, 2015)

Source: Author's construction

Table B. Samples of countries

Cross-country data			Panel data	
1993-2012	1993-2002	2003-2012	1993-2012 5-year averages	1993-2012 10-year averages
Algeria	Algeria	Algeria	Algeria	Algeria
Argentina	Argentina	Australia	Argentina	Argentina
Australia	Australia	Austria	Australia	Australia
Austria	Austria	Bangladesh	Austria	Austria
Bangladesh	Bangladesh	Belgium	Bangladesh	Bangladesh
Belgium	Belgium	Benin	Belgium	Belgium
Benin	Benin	Botswana	Benin	Benin
Bolivia	Bolivia	Brazil	Bolivia	Bolivia
Botswana	Botswana	Bulgaria	Botswana	Botswana
Brazil	Brazil	Canada	Brazil	Brazil
Bulgaria	Bulgaria	Chile	Bulgaria	Bulgaria
Burundi	Burundi	Colombia	Burundi	Burundi
Cameroon	Cameroon	Congo, Dem. Rep.	Cameroon	Cameroon
Canada	Canada	Congo, Rep.	Canada	Canada
Chile	Chile	Costa Rica	Chile	Chile
China	China	Cyprus	China	China
Colombia	Colombia	Côte d'Ivoire	Colombia	Colombia
Congo, Dem. Rep.	Congo, Rep.	Denmark	Congo, Rep.	Congo, Dem. Rep.
Congo, Rep.	Costa Rica	Dominican Rep.	Costa Rica	Congo, Rep.
Costa Rica	Côte d'Ivoire	Egypt	Côte d'Ivoire	Costa Rica
Côte d'Ivoire	Cyprus	El Salvador	Cyprus	Côte d'Ivoire
Cyprus	Denmark	Finland	Denmark	Cyprus
Denmark	Dominican Rep.	France	Dominican Rep.	Denmark
Dominican Rep.	Ecuador	Germany	Ecuador	Dominican Rep.
Ecuador	Egypt	Ghana	Egypt	Ecuador
Egypt	El Salvador	Greece	El Salvador	Egypt
El Salvador	Finland	Guatemala	Finland	El Salvador
Finland	France	Honduras	France	Finland
France	Germany	Hungary	Germany	France
Germany	Ghana	India	Ghana	Germany
Ghana	Greece	Indonesia	Greece	Ghana
Greece	Guatemala	Iran	Guatemala	Greece
Guatemala	Haiti	Ireland	Haiti	Guatemala
Haiti	Hungary	Israel	Honduras	Haiti
Honduras	India	Italy	Hungary	Honduras
Hungary	Indonesia	Jamaica	India	Hungary
India	Iran	Japan	Indonesia	India
Indonesia	Ireland	Jordan	Iran	Indonesia
Iran	Israel	Kenya	Ireland	Iran
Ireland	Italy	Korea, Rep.	Israel	Ireland
Israel	Jamaica	Lesotho	Italy	Israel
Italy	Japan	Malaysia	Jamaica	Italy
Jamaica	Jordan	Mali	Jordan	Jamaica
Japan	Kenya	Mauritius	Kenya	Japan
Jordan	Korea, Rep.	Morocco	Korea, Rep.	Jordan
Kenya	Lesotho	Mozambique	Lesotho	Kenya
Korea, Rep.	Malaysia	Myanmar	Malaysia	Korea, Rep.
Lesotho	Mali	Nepal	Mali	Lesotho
Malaysia	Mauritius	Netherlands	Mauritius	Malaysia
Mali	Mexico	New Zealand	Mexico	Mali
Mauritius	Morocco	Nicaragua	Morocco	Mauritius
Mexico	Myanmar	Norway	Myanmar	Mexico
Morocco	Nepal	Pakistan	Nepal	Morocco
Mozambique	Netherlands	Paraguay	Netherlands	Mozambique
Myanmar	New Zealand	Peru	New Zealand	Myanmar
Nepal	Nicaragua	Philippines	Nicaragua	Nepal
Netherlands	Norway	Portugal	Norway	Netherlands
New Zealand	Pakistan	Romania	Pakistan	New Zealand
Nicaragua	Panama	Russian Federation	Panama	Nicaragua
Norway	Paraguay	Rwanda	Paraguay	Norway
Pakistan	Peru	Senegal	Peru	Pakistan
Panama	Philippines	Singapore	Philippines	Panama
Paraguay	Portugal	South Africa	Portugal	Paraguay
Peru	Romania	Spain	Romania	Peru
Philippines	Russian Federation	Sri Lanka	Russian Federation	Philippines
Portugal	Rwanda	Sweden	Senegal	Portugal
Romania	Senegal	Switzerland	Singapore	Romania
Russian Federation	Sierra Leone	Syrian Arab Rep.	South Africa	Russian
Rwanda	Singapore	Tanzania	Sri Lanka	Federation
Senegal	South Africa	Thailand	Swaziland	Rwanda
Sierra Leone	Spain	Togo	Sweden	Senegal
Singapore	Sri Lanka	Trinidad & Tobago	Switzerland	Sierra Leone
South Africa	Swaziland	Tunisia	Syrian Arab Rep.	Singapore
Spain	Sweden	Turkey	Thailand	South Africa
Sri Lanka	Switzerland	Uganda	Togo	Spain
Swaziland	Syrian Arab Rep.	United Kingdom	Trinidad & Tobago	Sri Lanka
Sweden	Thailand	United States	Tunisia	Swaziland

Switzerland	Trinidad & Tobago	Uruguay	Turkey	Sweden
Syrian Arab Rep.	Tunisia	Venezuela	Uganda	Switzerland
Tanzania	Turkey	Zambia	United Kingdom	Syrian Arab Rep.
Thailand	Uganda		United States	Tanzania
Togo	United Kingdom		Uruguay	Thailand
Trinidad & Tobago	United States		Venezuela	Togo
Tunisia	Uruguay		Yemen	Trinidad & Tobago
Turkey	Venezuela		Zambia	Tunisia
Uganda	Yemen			Turkey
United Kingdom	Zambia			Uganda
United States				United Kingdom
Uruguay				United States
Venezuela				Uruguay
Yemen				Venezuela
Zambia				Yemen
				Zambia

Source: Author's construction.

Table C. Variables description

Variable	Data source	Notes
GDP per capita growth	Penn World Tables v9.0 (Feenstra et al., 2015)	Compound annual growth rate of the ratio between real GDP at constant 2011 national prices (in mil. 2011US$) and population (in millions) over the relevant period.
GDP per capita, log	Penn World Tables v9.0 (Feenstra et al., 2015)	Logarithm of the ratio between real GDP at constant 2011 national prices (in mil. 2011US$) and population (in millions) in the first year of the period for cross-country data and in the beginning of the relevant period for panel data.
Education	Barro and Lee (2013)	Percentage of the population aged 15 and over for whom the secondary level is the highest level of education completed, averaged across the relevant period.
Terms of trade	World Bank (2016)	Change in and variability (measured by the standard deviation) across the relevant period of the net barter terms of trade index (measured relative to the base year 2000).
Geography	Clemens et al. (2012)	Time-invariant measure developed by Bosworth and Collins (2003), which averages the number of frost days and tropical land area.
Inflation	World Bank (2016)	Logarithm of (1+inflation/100), with inflation measured by the consumer price index. Average in the first five years of the period in cross-country datasets, and across the relevant period in panel datasets.
Budget balance	World Bank (2016)	Average of the levels of cash surplus/deficit (% of GDP) in first five years of the period for cross-country data, and across the relevant period in panel data.
Trade policy	Wacziarg and Welch (2003); Clemens et al. (2012)	Sachs and Warner's (1995) index of openness, updated until 2001 by Wacziarg and Welch (2003), and then until 2005 by Clemens et al. (2012). Data for the first year available for the relevant period in the cross-country datasets, and average across the relevant period in panel data.
State ineffectiveness	Author's calculation	Index of state ineffectiveness, with higher levels representing more ineffective states. Averages across the relevant period.
Political violence	Author's calculation	Index of political violence, with higher levels representing more violent states. Averages across the relevant period.
Life expectancy	World Bank (2016)	Level of life expectancy at birth, total (years). Data for the first year available for the relevant period in the cross-country datasets, and average across the relevant period in panel data.
Financial depth	World Bank (2016)	Average of the levels of money and quasi money (M2) as % of GDP in first five years of the period for cross-country data, and across the relevant period in panel data.
Revolutions	Aisen and Veiga (2013)	Average number of revolutions per year in the relevant time horizon from Databanks International (2009). (Data available only until 2005.)
Ethnic fractionalization	Teorell et al. (2016)	Arithmetic average of Alesina et al.'s (2003) measure of ethnic fractionalization over the period. Reflects the probability that two randomly selected people from a given country will not share the same ethnicity (which involves a combination of racial and

		linguistic characteristics). The higher the number the lower the probability.
ICRG	Teorell et al. (2016)	Arithmetic average of the ICRG indicator of quality of government over the period. This indicator is the mean value of the ICRG variables 'Corruption', 'Law and Order' and 'Bureaucracy Quality', scaled 0-1.
Settler mortality, log	Teorell et al. (2016)	Time-invariant variable representing the settler mortality rate faced by European settlers obtained by Acemoglu, Johnson and Robinson (2001).
Distance to equator	Hall and Jones (1999)	Time-invariant variable obtained by taking the absolute value of latitude in degrees and dividing it by 90 to obtain a 0-1 scale.
Population speaking an European language	Rodrik, Subramanian and Trebbi (2002)	Time-invariant variable that represents the fraction of a country's population speaking one of the five primary Western European languages (English, French, German, Portuguese, and Spanish) as a mother tongue in the present (considering 1999 as the present year).
Population speaking English	Rodrik, Subramanian and Trebbi (2002)	Time-invariant variable that captures the percentage of the population speaking English as a mother tongue in the present (considering 1999 as the present year).
Frankel and Romer's log of predicted trade share	Hall and Jones (1999)	Time-invariant variable constructed by Frankel and Romer (1996) based on a gravity model of international trade that considers only the population of a country and its geographical characteristics.
Domestic food price index	Food and Agriculture Organization (2016)	Level of the domestic food price index averaged across the relevant time period.

Notes: 'Relevant period' corresponds to the full period in the case of cross-country datasets, and to 5-year or 10-year averages in the case of panel datasets.

Source: Author's construction.

Table D. Descriptive statistics, cross-country data

	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
	1993-2012					1993-2002					2003-2012				
Real GDP per capita growth	92	2.136641	1.576926	-2.011328	8.653811	87	1.882072	1.845489	-3.612879	7.208185	80	2.417622	1.887718	-1.072815	10.11893
Log(initial pc GDP)	92	8.827087	1.173076	5.831714	10.9823	87	8.92795	1.111673	6.469967	10.9823	80	8.915889	1.187617	5.831714	10.9823
Education	92	21.76891	11.98971	1.201902	50.53092	87	20.15492	11.9177	1.311274	53.82947	80	25.1612	12.97448	1.647901	52.95671
Change in terms of trade	92	3.73645	24.72288	-42.45064	103.2097	87	-.967539	2.791307	-9.782608	5.849472	80	-5.425709	33.85301	-130.7658	115.33
St. dev. of terms of trade	92	16.7738	15.06852	.9890673	75.80861	87	7.227754	8.076818	.0896293	40.78114	80	12.25825	12.95037	.9912537	56.95029
Geography	92	-.0422727	.9944857	-1.04	1.783878	87	.0092951	.9977092	-1.04	1.783878	80	.0206035	1.010335	-1.04	1.783878
Log(1+inflation)	92	.2156044	.5059478	.0074228	4.007075	87	.1716055	.3184602	.0074228	2.217585	80	.0559338	.0438649	.00037	.191469
Initial budget balance	92	-2.124591	3.350551	-8.871235	13.66614	87	-2.15153	3.430725	-8.871235	13.66614	80	-1.104589	3.795847	-8.528645	13.15924
Initial trade policy	92	.75	.4353854	0	1	87	.7816092	.4155492	0	1	80	.8625	.3465472	0	1
Sub-Saharan Africa	92	.2391304	.4288898	0	1	87	.2068966	.407429	0	1	80	.225	.4202169	0	1
East Asia	92	.1195652	.3262303	0	1	87	.1264368	.3342676	0	1	80	.125	.3328055	0	1
Latin America and Caribbean	92	.2282609	.4220114	0	1	87	.2298851	.4231979	0	1	80	.1875	.3927749	0	1
State ineffectiveness	92	-.4387873	2.643555	-5.382778	4.168341	87	-.6817894	2.524259	-5.094729	3.856543	80	-.7292272	2.706384	-5.5108	4.306918
Political violence	92	.000762	1.850667	-2.053569	7.550156	87	-.0178419	1.978693	-2.096025	7.658358	80	-.0328353	1.894972	-2.03281	7.429932

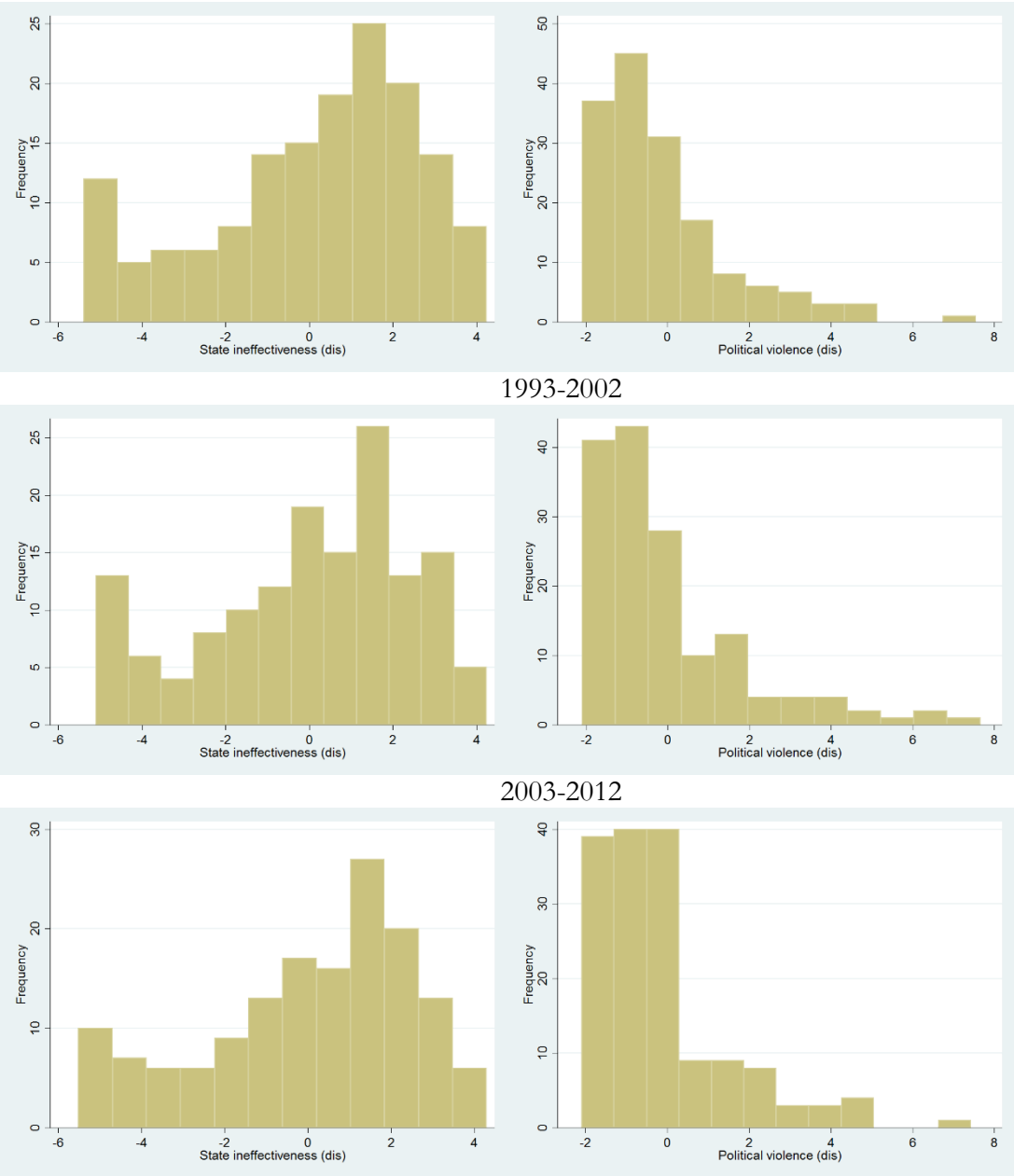
Source: Author's calculation based on the data described in Tables A and C.

Table E. Descriptive statistics, panel data

	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
	5-year periods					10-year periods				
Real GDP per capita growth	198	2.612477	2.235379	-4.319879	12.29542	167	2.138623	1.879454	-3.612879	10.11893
Log(initial pc GDP)	198	8.945407	1.071635	6.238213	11.22593	167	8.941128	1.147029	6.157898	11.15617
Education	198	21.69387	12.33916	1.508707	57.03806	167	22.55314	12.64861	1.311274	53.82947
Terms of trade	198	-.9735745	12.18255	-88.2172	71.92255	167	-3.10319	23.54622	-130.7658	115.33
Geography	198	-.0684408	.9732804	-1.04	1.783878	167	.0147123	1.000762	-1.04	1.783878
Log(1+inflation)	198	.0876239	.1745852	-.0110155	2.217585	167	.0951365	.1729159	-.0008251	1.633731
Budget balance	198	-1.252692	3.46125	-10.95463	13.66614	167	-1.874662	3.393525	-9.621738	14.80713
Trade policy	198	.8558923	.33265	0	1	167	.8518962	.3390988	0	1
Sub-Saharan Africa	198	.1919192	.3948081	0	1	167	.2155689	.4124531	0	1
East Asia	198	.1363636	.3440442	0	1	167	.1257485	.3325629	0	1
Latin America and Caribbean	198	.2575758	.4384076	0	1	167	.2095808	.4082336	0	1
State ineffectiveness	198	-.5386637	2.425426	-5.440109	4.314941	167	-.7045141	2.605269	-5.5108	4.306918
Political violence	198	.0869463	2.000104	-2.096025	7.70021	167	-.0250243	1.933225	-2.096025	7.658358

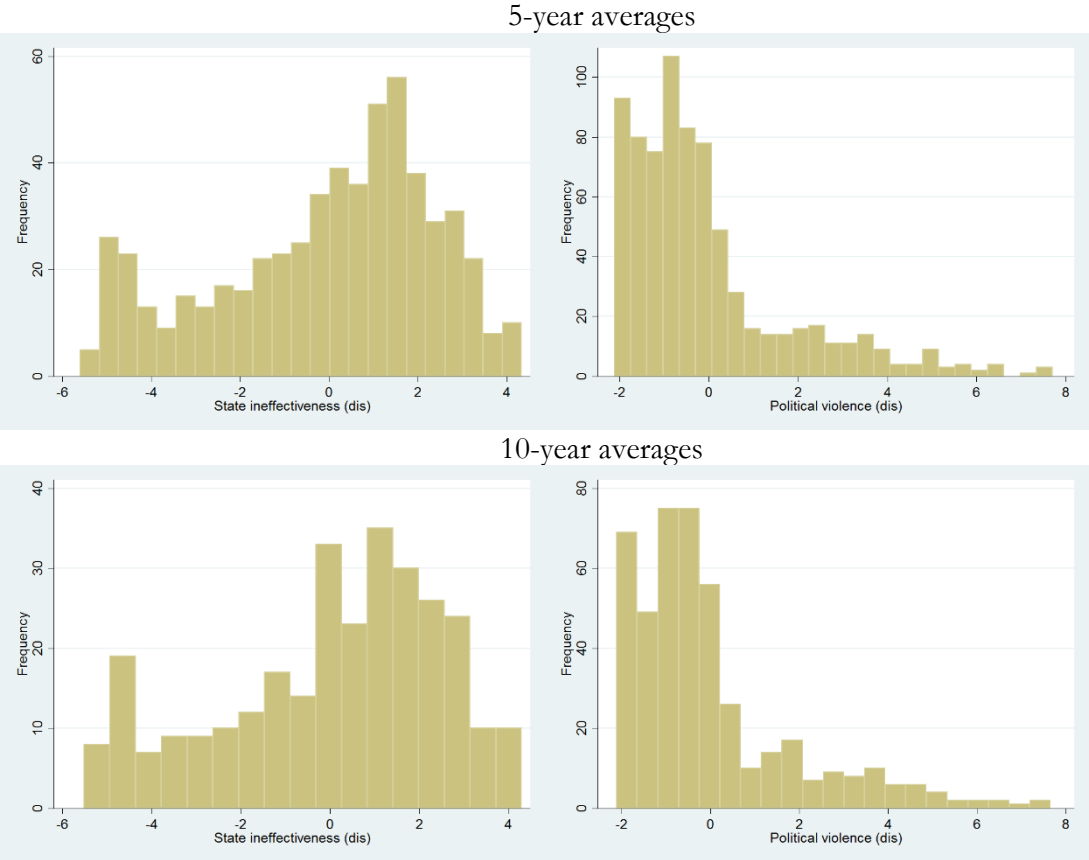
Source: Author's calculation based on the data described in Tables A and C.

Figure A. Histograms for state ineffectiveness and political violence, cross-country data 1993-2012



Source: Author's calculation based on the data described in Table A.

Figure B. Histograms for state ineffectiveness and political violence, panel data



Source: Author's calculation based on the data described in Table A.