On the Measurement of Political Instability and its Impact on Economic Growth

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Abstract:

We examine the relationship between political instability and economic growth. Using an exploratory factor analysis we identify four dimensions of political instability: (1) mass civil protest, (2) politically motivated aggression, (3) instability *within* the political regime and (4) instability *of* the political regime. We show that individual political instability indicators are generally poor proxies for the underlying dimensions of political instability. Our panel estimates for a sample of 98 countries in the period 1984-2003 indicate that the various dimensions of political instability have different effects on economic growth.

Keywords: political instability, factor analysis, economic growth

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Introduction

Ever since the early studies by Venieris and Gupta (1986) and Gupta (1990), economists have tried to understand the relationship between political instability and economic outcomes. Drazen (2000) provides two reasons why political instability may affect economic outcomes. Firstly, political instability creates uncertainty with respect to future institutions and policymakers, which alters the behavior of private agents and firms with respect to the accumulation of capital. In addition, it changes the incentives of policymakers who either try to increase their term in office or take benefit of the position they have while they are in office.[1] Secondly, political instability can have a direct effect on productivity, because it disrupts market functioning and economic relations.

Since political instability in a country cannot be measured directly, empirical studies often rely on indicators like the number of *coups d'état* (Londregan and Poole, 1990) or proxies such as the number of political assassinations and political revolutions (Barro, 1991). While these indicators probably capture some aspects of political instability, they are certainly not perfect. Some authors acknowledge the problem of measurement error and combine various indicators in a single index using discriminant analysis (Gupta, 1990; Venieris and Gupta, 1986) or principal components analysis (e.g. Alesina and Perotti, 1996; Annett, 2001). Others predict the propensity of government change using binary choice models in which the occurrence of (irregular) government transfers is related to various economic, political and institutional variables (e.g. Cukierman, Edwards and Tabellini, 1992; Alesina, Ozler, Roubini and Swagel, 1996; Chen and Feng, 1996; Svensson, 1998).

These approaches have in common that the used indicators are assumed to be highly correlated with political instability and that political instability is a one-dimensional concept. The first assumption is generally validated on theoretical grounds, but it is never thoroughly tested. The assumption that political instability has only one dimension has been disputed by a number of studies in political science using the principal components method to identify different dimensions of political instability. Although these studies primarily focus on the dimensionality of political violence (which is a rather narrow

[1] See Carmignani (2003) for a survey of the theoretical literature concerning political instability and economic outcomes.

definition of political instability, see Carmignani (2003)), none of these studies finds that political instability is one-dimensional. Instead, the results vary substantially ranging from two (Hibbs, 1973) to nine dimensions (Feierabend and Feierabend, 1966).[2] More recent work in economics (e.g. Chauvet, 2002 or Campos and Nugent, 2002) acknowledges that political instability is multidimensional and identifies various dimensions of political instability on *a priori* grounds. These dimensions, in turn, are represented by a selected group of indicators. This approach obviously entails the risk of a confirmation bias when determining the dimensionality of political instability.

This paper has three objectives. The first aim is to examine the dimensionality of political instability in a more substantive way than in previous studies. We employ 26 widely used indicators of political instability in an exploratory factor analysis (EFA). In contrast to principal components analysis (PCA), which is a data reduction technique to explain as much variance of the indicators as possible, factor analysis models the covariance of a group of indicators in such a way that the common variation in the variables is explained by a smaller set of underlying factors (latent variables). The second aim is to examine how individual indicators relate to these identified factors in order to assess measurement errors of individual indicators. The third aim is to analyze whether various dimensions of political instability may have different effects. Therefore, we examine how the dimensions of political instability that we identify are related to economic growth for a sample of 98 countries in the period 1984-2003.

We find that political instability has four dimensions: mass civil protest, politically motivated aggression, instability *within* the political regime, and instability *of* the political regime. Furthermore, we find that individual indicators are generally poor reflections of the underlying latent variable. Finally, we show that the four political instability dimensions that we identify have different effects on economic growth.

The remainder of the paper is organized as follows. Section 2 briefly discusses the factor analysis model. Our dataset is discussed in section 3. Section 4 provides the results of the factor analysis. We examine the differences between the dimensions of political

[2] Other studies that also address the dimensionality of political instability using principal components analysis include Rummel (1963), Tanter (1966), Rummel (1966) , Bwy (1968) who all find three dimensions, Morrison and Stevenson (1971) find four dimensions. Sanders (1981) criticizes the cited studies and provides a theoretical framework of the dimensionality of political instability. He concludes that political instability has four dimensions.

instability in more detail in section 5. In section 6, we use our newly constructed indexes to examine whether the different dimensions of political instability are related to economic growth. Section 7 concludes the paper.

2. Methodology

The literature concerning political instability has employed many different variables to reflect the unobserved concept of political instability. While every single indicator probably reflects some information about political instability, none of them is perfect. In other words: political instability indicators contain measurement error. To solve the measurement problem, researchers have frequently calculated one dimensional indexes using discriminant analysis (Gupta, 1990; Venieris and Gupta, 1986) or principal components analysis (e.g. Alesina and Perotti, 1996; Annett, 2001). Others have tried to predict the propensity of government change using binary choice models in which the occurrence of government transfers is related to various economic, political and institutional variables (e.g. Cukierman, Edwards and Tabellini, 1992; Chen and Feng, 1996). A shortcoming of the studies that combine indicators into a single index, is the assumption that political instability is a one dimensional concept. This would not be too problematic if all (relevant) sub dimensions would behave similarly and would affect the economy in a similar fashion. However, this is unlikely on theoretical grounds. Svensson (1998), for instance, argues that political instability is negatively related to capital accumulation (and hence economic growth) since it creates uncertainty with respect to the security of property rights. However, Bueno de Mesquita and Root (2000) argue that the possibility of government change, or unstable leadership, creates competition over policy ideas, which will lead to better government policies and will foster economic growth.

In order to examine the multidimensional character of political instability we employ factor analysis. Although this method is akin to principal components analysis, the subtle difference is that the latter is a data reduction method to extract as much of the variance contained in a set of indicators, while factor analysis is based on a model and extracts

only the information common to all indicators. We will briefly discuss the factor analysis model.[3]

As said, the aim of the factor analysis model is to separate the information that is common to all indicators from the information that is unique to a single indicator. By assuming that the observed indicators are "generated" by a linear combination of unobserved factors and some individual error term, a simple model structure is imposed on the covariance matrix of the indicators. When a convenient and parsimonious model is specified, the factor analysis can be used to obtain unbiased predictions of the values of the unobserved latent variables.

The factor analysis model with multiple factors can be written as follows:

$$y_n = B\xi_n + \varepsilon_n \qquad (1)$$

where y denotes the observed (demeaned) indicator for observation n, B is the matrix of factor loadings, ξ is a vector of latent variables and ε is a random error term assumed to be uncorrelated with the latent variables as well as uncorrelated with each other. Under these assumptions, the covariance matrix of the model is:

$$\Sigma = B\Phi B' + \Omega \qquad (2)$$

where Σ is the parameterized covariance matrix, Φ is the covariance matrix of the factors and Ω is the (diagonal) covariance matrix of the error terms. The first term on the right-hand side of equation (2) reflects the variance explained by the linear combination of the factors and the second term reflects the variance unique to the individual indicator. The latter shows how much measurement error an indicator contains.[4]

We estimate the factor loadings and the unique variances with the method of Maximum Likelihood. Under the normality assumption, we write the likelihood function:

[3] A rigorous treatment of factor analysis can be found in Wansbeek and Meijer (2000).

[4] It can be shown that the unique variance of an indicator equals 1-"the reliability of the indicator". The reliability of an indicator reflects how well the indicator is explained by the factors. That is, it is the R-squared of the regression of the indicator on the factors.

$$L = \log|\Sigma| + tr(\Sigma^{-1}S) \qquad (3)$$

where S is the sample covariance matrix of the indicators.

Having optimized the likelihood function, it is possible that the factors of the (standardized) solution of the model are difficult to interpret. In that case, we can make use of the fact that the distribution of the indicators depends on the factor loadings B, only through $B\Phi B'$ and hence the matrix of factor loadings is not identified. That is, it can be multiplied with any orthonormal matrix without affecting the distribution of the indicators. In other words: the factor loadings matrix is open to rotation, yielding a solution that may be easier to interpret because the matrix has a simpler structure. Ideally, each indicator is correlated with as few factors as possible. The rotation technique that we use to interpret the factors is the Oblimin rotation, which allows for correlation among the factors and minimizes the correlation of the columns of the factor loadings matrix. As a result, a typical indicator will have high factor loadings on one factor, while it has low loadings on the other factors.

When the model is correctly estimated and interpreted, it is possible to obtain values for the underlying factors, i.e. the separate dimensions of political instability. These values of the dimensions of political instability can be used to evaluate the correlation with individual indicators, but can also be used in empirical applications to obtain more reliable estimates of the role of political instability in economics. Although various approaches exist, we advocate the so-called Bartlett predictor (Bartlett, 1937):

$$\hat{\xi}_n = (B'\Omega^{-1}B)^{-1}B'\Omega^{-1}y_n \qquad (4)$$

The Bartlett predictor is found to be the best linear unbiased predictor of the factor scores (see e.g. Wansbeek and Meijer, 2000).

3. Data

In order to construct a dataset for the factor analysis model on political instability, we have to take a number of decisions with respect to which indicators to include, which sources to use and which period to consider. In principle, we aim to use as many indicators as possible that proxy for political instability. The indicators are mainly selected on the basis of the surveys by Brunetti (1997), Aron (2000) and Carmignani (2003). The indicators we use for our analysis are from the following commonly used sources: *The Banks Cross National Time Series Archive* (Banks, 2005), *The International Country Risk Guide* (ICRG), the *Polity IV* dataset, the *International Peace Research Institute Oslo* (Gleditsch et. al, 2002) and the *Database of Political Institutions* of the World Bank (Beck et al., 2001).[5]

To meet the assumptions underlying the factor analysis model we have to leave out a number of potential indicators. Firstly, we include only indicators that are manifestations of political instability and not potential causes. Therefore, we exclude a frequently used indicator such as ethno-linguistic fractionalization from the dataset. Secondly, a number of available indicators are based on each other and therefore are correlated not only because they possibly reflect the same latent phenomenon, but also because their measurement errors are correlated. For example, the available indicator "number of changes in the chief executive" of the Banks data archive is based on the variable "years in office of the chief executive" which is available in the DPI dataset. Since most variables of the other data sources are based on frequencies, we dropped all indicators from the DPI that are based on tenures in order to meet the assumptions of the factor analysis model.[6]

Next, we have to decide on the appropriate time period. As the ICRG indicators are only available from 1984 onwards, they restrict our dataset to the period 1984-2003. As Durlauf, Johnson and Temple (2005) rightly argue, indicators of political instability are

[5] In case an indicator (e.g. election data and cabinet changes) is contained in more than one source, we used the source with the maximum number of observations.

[6] One exception is the variable *Years of ruling party in office* of the DPI for which no indicator was available based on frequencies.

valid proxies only when they are averaged over a longer time period. For that reason, we calculated 10-year averages of the indicators.[7]

A problem we encountered for some indicators is missing data. Not all indicators are available for all countries in all years. Therefore, we only included some indicator in our sample if at least 5 observations were available in a given time period. Unfortunately, still some missing observations remain. If we would leave out those countries for which we do not have data for all indicators our dataset would decrease by twenty-three percent (59 out of 254 country observations). Since only one percent (95 out of 6604 indicator observations) of all observations is missing, samplewise deletion would imply that valuable information contained in the available indicators would be lost. In order to use as much information as possible and to obtain factor scores for those observations with missing data, we applied the EM algorithm of Dempster, Laird and Rubin (1977) to impute the missing observations.[8]

In sum: we have 10-year averages for 26 political instability indicators which are available for 128 countries for the period 1984-2003. These indicators (and their definitions) can be found in appendix A. Appendix B shows the correlation matrix of the indicators. Finally, Appendix D contains a list of countries included in the EFA.

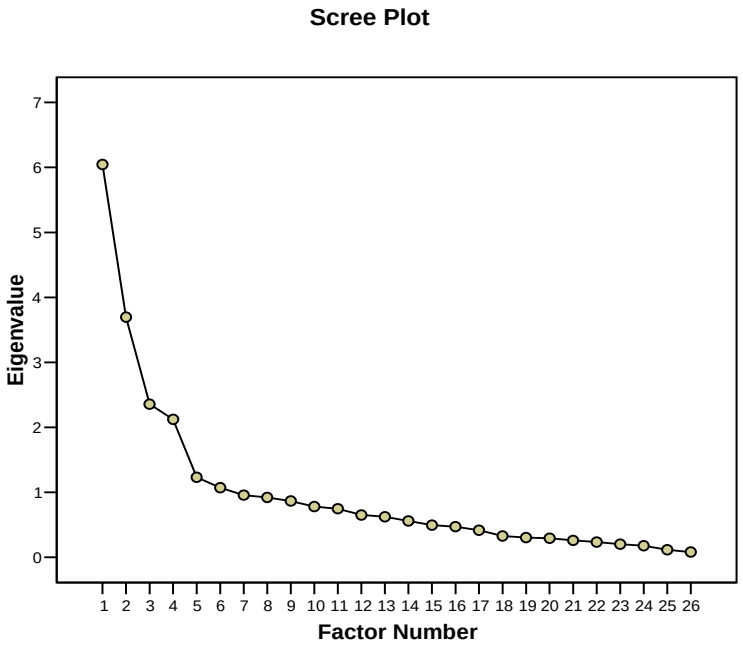
4. Results

To extract the appropriate number of factors in the exploratory factor analysis, we consider a number of commonly used "rules" and fit-statistics. We start with examining Cattell's screeplot (Cattell, 1966) which plots the number of factors against the eigenvalues of the covariance matrix of the indicators.

[7] We also did the same analysis with 5-year averages as well as 20-year averages. It turns out that using longer and shorter time spans does not alter the results reported in the next section.

[8] A different approach we also considered is to impute the missing observations with the mean of the relevant indicator. It turns out that the correlation coefficient of the identified factors with data imputation with the identified factors with imputed means is always greater 0.98. We also examined the case when covariances are calculated pairwise and factor scores were only calculated for those cases for which all indicators were available. The correlation coefficients between this solution (without imputation) with our preferred approach are all greater than 0.99. Not surprisingly, all results we obtain in the remainder of the paper are qualitatively unaffected when the other two approaches are followed.

Figure 1. Screeplot of the eigenvalues and factors.



It can be seen that four factors have a large eigenvalue relative to the other twenty-two factors. That is, four dimensions explain a significant larger part of the variance contained in all indicators than the other twenty-two dimensions. Hence, on the basis of the screeplot, a model with four factors is appropriate to represent the information contained in the set of indicators.[9] This is confirmed by a Likelihood ratio test, which compares the factor model with four factors with a saturated factor model. The test-statistic is 829.53 which is $\chi^2(227)$ distributed and is highly significant at the one percent significance level. Moreover, the solution with four factors renders the smallest value for Akaike's Information Criterion as well as the Schwartz Criterion for all admissible models. From this, we conclude that a model with four factors is appropriate.

[9] A different rule is the Kaiser criterion, which states that all factors with eigenvalues greater than 1 should be included in the model. As the screeplot indicates, there are 6 factors with eigenvalue greater than 1. However, the solutions with five factors or more are so-called Heywood cases. These are solutions in which some of the unique variances of the indicators are estimated smaller than zero. In general a Heywood case (Heywood, 1931) is an indication of a poorly specified model (see e.g Marcoulides and Hershberger, 1997).

The results of the rotated factor solution can be found in table 1, which shows the matrix of factor loadings (also known as the pattern matrix).

Table 1. Rotated factor loadings and unique variance of indicators (pattern matrix)

	Factor				
	aggression	**protest**	**within**	**regime**	**unique variance**
Guerilla	0.96	0.05	0.00	-0.06	0.09
Civil War	0.77	-0.07	-0.02	0.05	0.39
Revolutions	0.75	-0.04	0.07	0.20	0.31
Assassinations	0.62	0.09	0.20	-0.13	0.57
Internal conflicts (ICRG)	0.53	-0.02	-0.18	0.48	0.31
Medium civil conflicts	0.52	0.04	-0.04	-0.05	0.74
Ethnic tensions	0.35	0.09	-0.21	0.43	0.52
Demonstrations	0.04	0.93	0.13	-0.10	0.11
Riots	0.12	0.83	0.03	-0.08	0.28
Strikes	0.07	0.46	0.32	0.03	0.64
Executive changes	-0.09	0.09	0.75	0.35	0.34
Veto players who drop from office	0.03	0.13	0.68	0.20	0.47
Fractionalization	0.07	-0.07	0.65	-0.31	0.46
Years of ruling party in office	-0.18	0.30	-0.54	-0.02	0.62
Polarization	-0.04	-0.06	0.50	-0.37	0.57
Number of elections	-0.06	0.11	0.49	-0.20	0.69
Government crises	0.16	0.21	0.49	0.20	0.58
Major constitutional changes	-0.13	0.06	0.02	0.82	0.36
coups d'etat	-0.05	-0.15	0.13	0.67	0.59
Regime changes (Polity IV)	0.02	0.10	0.02	0.60	0.60
Regime Changes (Banks)	0.07	-0.10	0.02	0.58	0.65
Government stability (ICRG) (*-1)	0.16	0.07	-0.06	0.54	0.60
Cabinet Changes	-0.02	0.13	0.45	0.50	0.53
Religious tensions	0.20	0.03	-0.19	0.33	0.77
Minor civil conflicts	0.10	0.09	-0.03	0.24	0.89
Purges	-0.02	0.22	-0.16	0.07	0.92

Note: The standardized solution is shown. Cells with factor loadings not between -0.3 and 0.3 are highlighted.

Since the Oblimin rotation minimizes the correlation between columns of the factor loadings matrix, the general pattern that arises is that every indicator has a high loading on one factor, while it has low loadings on the other factors. The indicators with high factor loadings can be used to interpret the factors. The first factor has high loadings for the indicators associated with political violence and warfare. Therefore, we call this factor "*politically motivated aggression*" and abbreviate it as: *Aggression*. Indicators that are associated with collective protest by the population are clearly the only variables that

have high loadings for the second factor. In turn, we label this factor as *mass civil protest*. The third factor is labeled "within regime instability" (and henceforth called: *Within*), because it corresponds to indicators reflecting changes within the political system such as the changes in the chief executive and replacements of veto players in the political process. The indicators with high loadings on the fourth factor are the number of major constitutional changes, the number of *coups d'état* and the number of regime changes (both indicators). These events obviously reflect instability of the political regime, which we dub as *Regime* from now on.

Table 1 also shows the variance of the indicators not accounted for by factors in the model. That is, it shows how well the latent dimensions of political instability are associated with the indicators. It can be seen that the majority of indicators have a unique variance of more than 0.5. So, individual indicators in general are poor proxies for the dimensions of political instability. This view is reinforced by inspection of the correlation coefficients of the factors with the indicators shown in table 2.

Table 2. Factor Structure Matrix: Correlation of the factors with the indicators.

	Factor			
	aggression	**protest**	**within**	**regime**
Guerilla	0.95	0.22	0.07	0.25
Civil War	0.81	0.15	0.11	0.42
Revolutions	0.78	0.09	0.02	0.28
Assassinations	0.66	0.17	-0.18	0.65
Internal conflicts (ICRG)	0.61	0.20	0.25	0.08
Medium civil conflicts	0.50	0.13	0.00	0.12
Ethnic tensions	0.19	0.26	0.43	0.49
Demonstrations	0.20	0.93	0.19	0.11
Riots	0.25	0.84	0.09	0.13
Strikes	0.19	0.50	0.35	0.13
Executive changes	0.09	0.19	0.73	0.30
Veto players who drop from office	0.16	0.21	0.68	0.19
Fractionalization	0.00	-0.08	0.67	-0.34
Years of ruling party in office	-0.17	0.23	-0.53	0.01
Polarization	-0.14	-0.12	0.52	-0.43
Number of elections	0.30	0.32	0.50	0.26
Government crises	-0.07	0.08	0.51	-0.23
Major constitutional changes	0.14	0.21	-0.04	0.79
coups d'etat	0.23	0.23	-0.01	0.62
Regime changes (Polity IV)	0.15	-0.01	0.08	0.61
Regime Changes (Banks)	0.34	0.21	-0.08	0.61
Government stability (ICRG) (*-1)	0.24	0.03	-0.02	0.58
Cabinet Changes	0.49	0.24	-0.21	0.57
Religious tensions	0.29	0.12	-0.19	0.41
Minor civil conflicts	0.19	0.16	-0.03	0.30
Purges	0.03	0.22	-0.15	0.12

Note: The table shows bivariate Pearson correlation coefficients of the factors with the indicators. Cells with correlation coefficients greater than 0.3 and smaller than -0.3 are highlighted.

The so-called factor structure matrix reveals that the indicators *guerilla* and *demonstrations* are highly correlated with the *Aggression* dimension (0.95) and the *Protest* dimension (0.93), respectively. It can be concluded that these indicators reflect these dimensions of political instability very well. However, the situation is different for the other two factors. Although a number of indicators have a relatively high correlation with the factor *Within*, *executive changes* has the highest correlation (0.73). While this indicator contains much information about the instability within the political system, it is not a perfect reflection of it and the other indicators (with lower correlation coefficients) add information about this dimension of political instability. The factor *Regime* has the highest correlation with *major constitutional changes* (0.79). Like the *Within* factor, all

indicators contain considerable measurement error about the *Regime* dimension of political instability. Finally, it can be seen that purges of government representatives and minor civil conflicts hardly correlate with any of the four political instability dimensions.

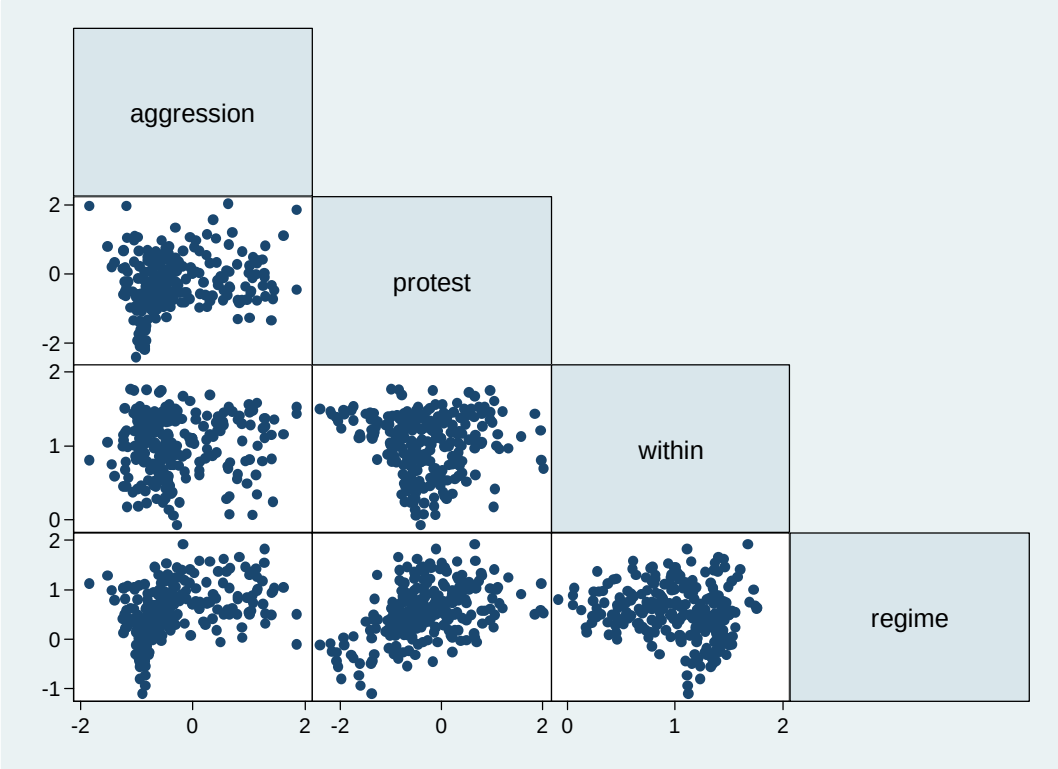
Our results clearly deviate from other studies focusing on the dimensionality of political instability. Although all dimensions that we find have been suggested as relevant aspects of political instability in one way or another, no study empirically differentiates between these four dimensions. Furthermore, our results show that individual indicators are poor reflections of the dimensions of political instability. Especially the dimensions that the political economy literature mostly focuses on are measured with a considerable amount of error. [10]

5. Differences between the dimensions of Political Instability: patterns within and between countries

This section examines the differences between the dimensions of political instability for which we have obtained factor score predictions in the previous section. Figure 2 shows a scatterplot matrix of the four dimensions of political instability. It is apparent from the figure that the four dimensions differ greatly and that in general there is no clear relationship between the dimensions. Only the *protest* dimension and the *regime* dimension seem to be positively related. Furthermore, there is a positive correlation between *aggression* and *regime*. However, as the figure shows, this is probably due to a few countries which did not experience regime instability as well as politically motivated aggression. For higher values of *aggression* the figure suggests no relationship between the two dimensions.

[10] We performed several sensitivity checks to examine the robustness of our results. First, we examined all solutions of the factor model when one of the twenty-six indicators was excluded from the model. Second, we examined all solutions of the factor model when one country was omitted from the sample. Finally, we checked whether the factor solutions would be different if different time spans (5- or 20 year averages) are used instead of 10-year averages. Our results are robust for all these sample changes.

Figure 2. Scatterplot Matrix of the Factor Scores



Note: Factor Scores are in natural logarithms.

A second issue that is interesting to examine is how individual countries score on the different dimensions of political instability. Table 3a contains a ranking of the ten most unstable countries per dimension in the two time periods, whilst table 3b shows the ten most stable countries per dimension.[11] Four patterns stand out. Firstly, reinforcing the picture of figure 2, it appears that instability on one dimension does not necessarily imply that a country is also unstable on a different dimension. For instance, Italy is very unstable with respect to the instability within the political regime, but does not enter the top 10 of most unstable countries on any other dimension.[12] Secondly, a high score on a particular dimension period is almost always accompanied with a high score on the same dimension in the next period. Hence, the dimensions of political instability seem to be very persistent. Thirdly, political instability seems to differ regionally. Whilst African

[11] A table with all factor scores can be found in appendix E.
[12] In fact, Italy's highest ranking on the other three dimensions is position 34 on the *regime* dimension in the period 1994-2003.

countries are primarily associated with instability of the political regime, Asian and Latin American countries receive high scores on the *Aggression* dimension of political instability as well as the *Protest* dimension. In addition, the most stable countries on the *Protest* and *Regime* dimension are almost all European countries. Fourthly, the top 10 of most stable countries on the *Within* dimension consist of nations that are often associated with authoritarianism. This finding is not remarkable, since these countries are obviously not associated with high values for the indicators that have high loadings on the *Within* dimension. That is, these countries do not have regular elections, cabinet changes or changes in the chief executive.

Table 3a. Top 10 most unstable countries per dimension in the period 1984-1993 and 1994-2003.

Period: 1983-1994

Dimension:	*Violence*		*Protest*		*Within*		*Regime*	
rank	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**
1	INDIA	5.40	SO AFRICA	6.59	ITALY	2.75	HAITI	4.79
2	PHILIPPINES	4.01	RUSSIAN FED	6.16	HAITI	2.33	SUDAN	4.21
3	PERU	3.29	KOREA REP	6.14	PAKISTAN	1.98	CONGO DR	2.81
4	SRI LANKA	3.11	INDIA	5.34	GUATEMALA	1.86	LEBANON	2.69
5	COLOMBIA	2.67	SERBIA/MONT	2.79	ECUADOR	1.76	NIGER	2.59
6	SUDAN	2.64	ISRAEL	2.35	JAPAN	1.51	NIGERIA	2.24
7	LEBANON	2.59	CHILE	2.17	NORWAY	1.49	MALI	2.24
8	EL SALVADOR	2.48	PHILIPPINES	2.05	PANAMA	1.48	LIBERIA	2.20
9	MYANMAR	2.47	POLAND	1.98	GREECE	1.36	SOMALIA	2.13
10	NICARAGUA	2.21	CHINA PR	1.88	ISRAEL	1.35	PAKISTAN	2.10

Period: 1994-2003

Dimension:	*Violence*		*Protest*		*Within*		*Regime*	
rank	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**
1	COLOMBIA	5.41	INDONESIA	3.83	JAPAN	2.84	SIERRA LEO	3.27
2	SUDAN	3.19	CHINA PR	1.84	ITALY	2.84	LIBERIA	3.04
3	SRI LANKA	3.07	SERBIA/MONT	1.76	ARGENTINA	2.79	CONGO DR	2.78
4	MEXICO	2.64	ARGENTINA	1.61	ECUADOR	2.63	ETH'PIA FDR	2.31
5	PERU	1.95	VENEZUELA	1.60	PAPUA NEW G	2.43	NIGER	2.31
6	TURKEY	1.86	HAITI	1.60	INDIA	1.77	GUINEA-B'AU	2.03
7	ALGERIA	1.82	ISRAEL	1.36	NORWAY	1.63	SOMALIA	1.95
8	RUSSIAN FED	1.74	MEXICO	1.25	PAKISTAN	1.61	ALGERIA	1.88
9	INDIA	1.71	BANGLADESH	1.22	ISRAEL	1.61	IVORY COAST	1.31
10	ANGOLA	1.63	PAKISTAN	1.10	COLOMBIA	1.60	PAKISTAN	1.24

Table 3b. Top 10 most stable countries per dimension in the period 1984-1993 and 1994-2003.

Period: 1983-1994

Dimension:	*Violence*		*Protest*		*Within*		*Regime*	
rank	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**
1	RUSSIAN FED	-0.84	NORWAY	-0.91	UA EMIRATES	-2.08	SWITZERLAND	-1.67
2	ALBANIA	-0.78	SWEDEN	-0.89	BAHRAIN	-1.95	NETHERLANDS	-1.52
3	MONGOLIA	-0.76	ICELAND	-0.88	IRAQ	-1.94	DENMARK	-1.39
4	TAIWAN	-0.75	FINLAND	-0.83	SA'U ARABIA	-1.86	LUXEMBOURG	-1.39
5	SLOVAK REP	-0.71	NETHERLANDS	-0.81	OMAN	-1.73	AUSTRIA	-1.33
6	CZECH REP	-0.71	LUXEMBOURG	-0.80	LIBYA	-1.73	FINLAND	-1.32
7	JAPAN	-0.70	DENMARK	-0.75	QATAR	-1.68	ICELAND	-1.24
8	HUNGARY	-0.70	SWITZERLAND	-0.75	CUBA	-1.68	US	-1.23
9	SINGAPORE	-0.70	NEW ZEALAND	-0.74	MALAWI	-1.66	SWEDEN	-1.22
10	KOREA REP	-0.69	TURKEY	-0.73	INDONESIA	-1.64	NORWAY	-1.11

Period: 1994-2003

Dimension:	*Violence*		*Protest*		*Within*		*Regime*	
rank	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**	**Country**	**factor score**
1	TAIWAN	-0.71	SWEDEN	-0.89	IRAQ	-1.93	SWITZERLAND	-1.61
2	SINGAPORE	-0.71	DENMARK	-0.88	CHINA PR	-1.81	ICELAND	-1.55
3	VIETNAM	-0.70	FINLAND	-0.87	CUBA	-1.80	FINLAND	-1.43
4	KOREA PR	-0.69	ICELAND	-0.86	SA'U ARABIA	-1.75	GERMANY	-1.42
5	CHINA PR	-0.69	CZECH REP	-0.86	SUDAN	-1.73	US	-1.36
6	JAPAN	-0.67	PORTUGAL	-0.85	SOMALIA	-1.68	LUXEMBOURG	-1.36
7	OMAN	-0.66	NETHERLANDS	-0.83	OMAN	-1.54	DENMARK	-1.36
8	ARGENTINA	-0.65	NORWAY	-0.82	UA EMIRATES	-1.52	NETHERLANDS	-1.27
9	SYRIA	-0.64	SWITZERLAND	-0.80	SINGAPORE	-1.43	EL SALVADOR	-1.27
10	BOTSWANA	-0.63	SLOVAK REP	-0.78	KOREA PR	-1.42	AUSTRALIA	-1.27

6. The impact of political instability on economic growth

In the previous sections we argued that political instability is a multidimensional concept and that individual political instability indicators contain measurement error. Furthermore, some descriptive statistics revealed that the dimensions of political instability manifest themselves differently in individual countries. As we differentiate between the separate dimensions of political instability and our newly distilled indexes suffer less from measurement error, it is worthwhile to examine whether these dimensions also affect macroeconomic outcomes differently.

A widely studied topic in which (one dimensional) measures of political instability are used as explanatory variables is (long run) economic growth.[13] To examine the effect that the different dimensions of political instability have on long term growth, we use an augmented version of the model of Mankiw, Romer and Weil (1992) and Islam (1995)[14] who derive the specification of their empirical model from the Solow (1956) model. As the model is used to examine the differences between the dimensions of political instability, we do not intensively examine the robustness of our results nor do we address the possibility of joint endogeneity of political instability and economic growth.[15]

The model we estimate is as follows:

$$\ln growth_{it} = \alpha + \mu_i + \beta \ln \mathbf{Z}_{it} + \gamma \ln \mathbf{X}_{it} + \varepsilon_{it}$$

where $growth_{it}$ represents the average economic growth per capita for country i in period t (1984-1993 and 1994-2003, respectively). $\mathbf{Z}_{it}$ is a vector with explanatory variables used by Mankiw et al. (1992). The vector includes the real gross-domestic product per capita (in 2000 US$) of country i at the beginning of period t, *Investment*, i.e., the average gross

[13] Examples include Gupta (1990), Londregan and Poole (1990), Barro (1991), Levine and Renelt (1992), Alesina et al. (1996), Perotti (1996), Ades and Chua (1997), Easterly and Levine (1997), Sala-i-Martin (1997) Chen and Feng (1997), Easterly (2001), Alesina et al. (2003) Sala-i-Martin, Doppelhofer and Miller (2004) and Sturm and de Haan (2005)

[14] The only difference between our model and the model of Mankiw et al. (1992) is that we use a fixed effects panel model with 2 time periods (1984-1993 and 1994-2003), while they use a cross-section model for the period 1960-1989. The main difference between our model and that of Islam (1995) is that we consider 10-year averages instead of 5-year averages to proxy for long-term economic growth.

[15] See De Haan and Sturm (2005) for a further discussion on robustness issues. See Alesina et al. (1996) or Perotti (1996), for instance, on the simultaneity in the relationship between political instability and economic growth.

domestic investment relative to GDP for country *i* in period *t*, *Secondary School Enrollment* (the percentage of the population above 15 that started with secondary schooling in country *i* at the start of period *t*)[16] and the growth of the population in period *t* in country *i*. Apart from the schooling variable, which is obtained from the Barro-Lee dataset (Barro and Lee, 2000), all variables are taken from the "World Bank Development indicators 2005".[17] The vector $\mathbf{X}_{it}$ contains the variables reflecting the various dimensions of political instability of country *i* in period *t*. The correlation matrix of the explanatory variables is shown in appendix C.

Since our dataset contains two periods, we allow for country specific effects in the regressions (indicated by μ_i in the model specification). This reduces potential endogeneity problems to the extent that the identified dimensions of political instability are correlated with country-specific (time invariant) characteristics. An F-test examining the hypothesis that all country specific effects equal zero is soundly rejected at the 5 percent significance level for all specifications. Moreover, Hausman tests (Hausman, 1978) comparing the estimates of a fixed effects model with the estimates of a random effects model all reject the null-hypothesis that the set of estimates do not differ systematically. On the basis of both tests, we conclude that the model specification should include country specific effects. Furthermore, the specification of the model is also not rejected by the more general Ramsey RESET test of specification error (Ramsey, 1969). Finally, we also checked whether the disturbance term is heteroscedastic. The White test (White, 1980) could not reject the null-hypothesis of homoscedastic disturbances for all specifications.

Our estimation results are shown in table 4.

[16] The Barro-Lee dataset on schooling contains only data for the years 1980, 1985, 1990, 1995 and 2000. To approximate begin of period schooling we use the values of 1980 and 1990. We also estimated the models with the values of 1985 and 1995, but this did not alter any of the results.

[17] We also estimated the models using the real GDP per capita indicator of the IMF world economic outlook. The reported results remain unchanged when using the alternative dependent variable.

Table 4. Estimation Results

Dependent variable Real GDP Growth per capita	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**
GDP per capita (begin of period)	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.05	-0.05
	*(-4.81)**	*(-4.89)**	*(-4.89)**	*(-4.91)**	*(-5.43)**	*(-4.76)**	*(-6.03)**	*(-5.92)**
Investment	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
	*(3.12)**	*(2.69)**	*(3.16)**	*(2.65)**	*(3.31)**	*(3.36)**	*(1.85)***	*(2.25)**
Secondary school enrollment	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	*(2.28)**	*(2.37)**	*(2.32)**	*(2.11)**	*(1.77)***	*(1.89)***	*(1.41)*	*(0.93)*
Population Growth	-0.21	-0.25	-0.25	-0.16	-0.20	-0.06	0.16	0.19
	(-0.44)	*(-0.53)*	*(-0.52)*	*(-0.34)*	*(-0.46)**	*(-0.12)*	*(0.37)*	*(0.43)*
Revolutions and Coups		-0.01						
		(-1.57)						
Assassinations			-0.01					
			(-0.91)					
Aggression				0.00				0.00
				(-1.15)				*(-0.29)*
Protest					-0.01			-0.01
					*(-3.85)**			*(-2.41)**
Within						0.01		0.01
						(1.35)		*(1.04)*
Regime							-0.02	-0.02
							*(-3.97)**	*(-2.83)**
Within R-Squared	0.32	0.34	0.33	0.33	0.43	0.34	0.43	0.49
Observations	184	184	184	184	184	184	184	184
Countries	98	98	98	98	98	98	98	98
F-test Fixed Effects	2.12	2.12	2.11	2.14	2.59	2.15	2.31	2.54
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hausman test	22.31	22.44	23.1	23.72	35.63	26.48	32.93	47.35
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ramsey RESET test	0.66	0.44	1.20	0.98	1.08	0.80	0.14	0.42
p-value	0.42	0.51	0.28	0.33	0.30	0.37	0.71	0.52
White test	7.34	6.18	8.35	8.54	6.55	8.13	5.58	7.62
p-value	0.12	0.29	0.14	0.13	0.26	0.15	0.35	0.37

Note: All variables are in natural logarithms. Panel estimates contain country specific fixed effects.
t-values shown in parenthesis. * = significant at 5% level, ** = significant at 10% level

The first column shows the results of the baseline specification of Mankiw et al. (1992). The variables of the baseline model all have the expected sign, but are not all statistically significant. Although our model controls for country specific effects, the estimates confirm the findings of Mankiw et al. (1992) that initial GDP levels and the (human) capital stock are significantly related to real GDP growth per capita, while population

growth is not a determinant of real GDP growth per capita. In the second and third column, we show the model estimates when two frequently used variables (i.e. the sum of revolutions and coups and the number of political assassinations) are used as proxies for political instability.[18] Since the models are estimated in natural logarithms we can interpret the estimated coefficients as elasticities. It can be seen that the estimated elasticities of these proxies for political instability are both -0.01 and are not significantly different from zero. Furthermore, the increase of the (within) R-squared of these models relative to the baseline specification is very small. On the basis of these indicators two conclusions could be drawn. Either political instability is unrelated to economic growth, or the relationship between political instability and economic growth is blurred by measurement error. Columns 4-7 show the estimates in which one of the four latent dimensions of political instability is added to the baseline model. The results indicate that the separate dimensions of political instability do not affect economic growth in a similar fashion. The estimated elasticities of the political instability variables differ both in size and significance. The *Aggression* dimension has a negative impact on economic growth, but the estimates are very close to zero and are not significantly different from zero. The *Within* dimension has a moderate positive impact on economic growth, but is also statistically insignificant. At first sight, the positive coefficient might be surprising. However, as illustrated in the previous section, this dimension also reflects the presence of democracy (or lack thereof) and there is some recent evidence suggesting that democracy has a positive impact on economic growth (see, e.g. Plümper and Martin, 2003). The *Protest* dimension is significantly different from zero and has an elasticity of -0.01. In other words: the estimate indicates that a one-hundred percent increase in civil protest decreases the growth rate with one percent. Moreover, the part of the variance in per capita real GDP growth that is explained by the model markedly increases when the *Protest* variable is added to the model. Finally, the *Regime* dimension has a negative impact on economic growth and is also significant at the five percent significance level. The estimate indicates that a hundred percent increase in regime instability decreases the growth rate with two percent. Again, the (within) R-squared is substantially higher than in the baseline specification as well as the specification in which only the sum of coups

[18] Examples are mentioned in footnote 12.

and variables are used to proxy for political instability.[19] The last column shows the estimates when all dimensions of political instability are included in the model. The results of this encompassing model do not differ from the other findings. However, the latter specification allows us to test the linear hypothesis that all political instability dimensions are equal. The F-test rejects the null hypothesis at the 5 percent significance level.[20] From this we conclude that the different dimensions of political instability have different effects on economic growth.

7. Concluding remarks

In this paper we examined the dimensionality of political instability using an exploratory factor analysis. In contrast to earlier studies we find that political instability has four dimensions. These dimensions are: civil protest, politically motivated aggression, instability *within* the political regime, and instability *of* the political regime. Secondly, simple correlation coefficients illustrate that individual indicators generally are poor reflections of the underlying latent dimension of political instability. Moreover, political instability indicators used in previous studies often do not reflect the concept the researchers have in mind when they examine the effect of political instability on economic outcomes. Finally, we examined to which extent the dimensions of political instability are different. Using a model similar to Mankiw et al (1992) we show that the four political instability dimensions have different effects on long run economic growth. We find that only instability *of* the political regime and civil protest are significantly related to long run economic growth and that a hundred percent increase of these dimensions is associated with a lower real per capita growth rate of two percent and one percent, respectively. Furthermore, the model including our indices for political instability explains a substantially larger part of the variance of the growth rate than an

[19] In order to examine parameter constancy we estimated the same models with regional (Latin America, Sub-Saharan Africa, Middle East\North Africa, Eastern Europe, South Asia, East Asia and OECD), income (low, lower-middle, upper middle and high income countries according to World Bank definitions) and polity (democratic, partly democratic and non democratic) specific coefficients for all political instability variables. When testing the linear restriction that all regional (or income or polity) coefficients are equal, we find that there is no parameter heterogeneity with respect to income level and the political system for any of the political instability variables. However, we do find that the effect of *within* instability on economic growth is significantly different in OECD (23 countries) and in Eastern European countries (4 countries). For these countries the estimated elasticity is -0.03 and 0.13, respectively.

[20] The test statistic is 2.75 and F(3,78) distributed. The p-value is 0.048.

often used proxy for political instability being the sum of political revolutions and coups. We want to emphasize here that the economic implications of our results still have to be taken with care. An important issue which is not addressed in this paper, for example, is the possibility of reverse causality between economic growth and political instability. In addition, issues that receive increasing interest in the growth literature such as the importance of influential observations and model uncertainty are not dealt with. These issues obviously provide opportunities for further research. Nevertheless, our results strongly indicate that considering political instability as a one dimensional phenomenon may lead to misleading results in empirical applications.

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Appendix A. List of variables, definitions and sources

Indicator	definition	Source
Assassinations	Any politically motivated murder or attempted murder of a high government official or politician	Banks (2005)
Cabinet changes	The number of times in a year that a new premier is named and/or 50% of the cabinet posts are occupied by new ministers.	Banks (2005)
Civil war	dummy variable, 1 if at least 1000 battle related deaths per year in a conflict between the government of a state and internal opposition groups without foreign intervention and 0 otherwise.	Gleditsch et al. (2002)
Coups d'etat	The number of extraconstitutional or forced changes in the top government elite and/or its effective control of the nation's power structure in a given year.	Banks (2005)
Major government crises	Any rapidly developing situation that threatens to bring the downfall of the present regime, excluding situations of revolt aimed at such overthrow	Banks (2005)
Demonstrations	Any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature	Banks (2005)
Ethnic tensions	An assessment of the degree of tensions within a country which is attributable to racial, nationality or language divisions	ICRG
Executive changes	The number of times in a year that effective control of the executive Dower changes hands.	Banks (2005)
Fractionalization	The probability that two deputies picked at random from the legislature will be of different parties.	Beck et al. (2001)
Government stability	An assessment of the governments ability to carry out its declared programs and its ability to stay in office	ICRG
Guerilla warfare	Any armed activity, sabotage, or bombings carried on by independent bands of citizens or irregular forces and aimed at the overthrow of the present regime.	Banks (2005)
Internal conflicts	an assessment of political violence in the country and its actual or potential impact on governance	ICRG
Major constitutional changes	The number of basic alterations in a state's constitutional structure, the extreme case being the adoption of a new constitution that significantly alters the prerogatives of the various branches of government.	Banks (2005)
Medium civil conflicts	Dummy variable, 1 if there are more than 25 battle related deaths per year and a total conflict history of more than 1000 battle related deaths, but fewer than 1000 per year (between the government of a state and internal opposition groups without foreign intervention) and 0 otherwise	Gleditsch et al. (2002)
Minor civil conflicts	Dummy variable, 1 if there are at least 25 battle related deaths per year for every year in the period in a conflict between the government of a state and internal opposition groups, without foreign intervention and 0 otherwise	Gleditsch et al. (2002)
Number of elections	The number of elections held for the lower house of a national legislature in a given year.	Banks (2005)
Polarization	Maximum polarization between the executive party and the four principle parties of the legislature.	Beck et al. (2001)
Years of ruling party in office	Number of years that the party of the chief executive has been in office	Beck et al. (2001)
Purges	Number of systematic repressions (or eliminations) by jailing or execution of political opposition within the rank of the regime or the opposition	Banks (2005)

Regime changes (I)	Dummy variable, 1 if the variable "durable" is 0 in the polity IV dataset, which means that a new regime has started or that the state is in anarchy, 0 otherwise	Polity IV
Regime changes (II)	Dummy variable, 1 if according to the Banks data archive the type of regime has changed	Banks (2005)
Religious tensions	An assessment of the degree of tensions within a country which is attributable to religious divisions	ICRG
Revolutions	Any illegal or forced change in the top governmental elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government.	Banks (2005)
riots	Any violent demonstration or clash of more than 100 citizens involving the use of physical force	Banks (2005)
Number of veto players who drop from office	The percent of veto players that drop from the government given the senate does not change	Beck et al. (2001)
Strikes	Any strike of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority.	Banks (2005)

Appendix B. Correlation matrix of the indicators

	Assas	strike	guerilla	crises	purges	riots	revol	demons	coups	majchang	cabchang	execchang	numelect	regichange	govstab	ethtension	reltension	intcon	prtyin	frac	polariz	stabns	MinCiv	MedCiv	CivWar	Bregichang
Assas	1.00																									
strike	0.22	1.00																								
guerilla	0.61	0.20	1.00																							
crises	0.26	0.42	0.28	1.00																						
purges	0.03	0.10	0.04	0.03	1.00																					
riots	0.16	0.49	0.30	0.23	0.07	1.00																				
revol	0.47	0.08	0.77	0.29	0.04	0.11	1.00																			
demons	0.25	0.49	0.22	0.35	0.20	0.80	0.18	1.00																		
coups	-0.02	0.05	0.10	0.04	-0.06	0.00	0.29	-0.05	1.00																	
majchang	0.02	0.08	0.11	0.15	0.10	0.11	0.27	0.13	0.55	1.00																
cabchang	0.18	0.22	0.15	0.47	0.00	0.23	0.27	0.25	0.31	0.41	1.00															
execchang	0.20	0.33	0.09	0.52	-0.02	0.17	0.15	0.23	0.26	0.26	0.50	1.00														
numelect	0.12	0.23	-0.04	0.15	-0.02	0.08	-0.06	0.16	-0.12	-0.12	0.15	0.34	1.00													
regichange	0.12	0.09	0.22	0.24	0.08	0.11	0.35	0.19	0.39	0.62	0.33	0.19	-0.18	1.00												
govstab	0.14	0.27	0.30	0.22	0.15	0.16	0.28	0.13	0.29	0.42	0.26	0.18	-0.05	0.29	1.00											
ethtension	0.06	0.08	0.43	0.20	0.13	0.24	0.45	0.15	0.23	0.36	0.24	0.00	-0.23	0.35	0.48	1.00										
reltension	0.09	0.08	0.23	0.11	0.00	0.17	0.21	0.05	0.19	0.25	0.15	-0.01	-0.27	0.19	0.21	0.41	1.00									
intcon	0.34	0.20	0.58	0.21	0.06	0.15	0.57	0.10	0.30	0.39	0.27	0.03	-0.27	0.36	0.66	0.69	0.47	1.00								
prtyin	-0.14	-0.14	-0.12	-0.19	0.25	0.07	-0.12	0.15	-0.10	0.11	-0.28	-0.30	-0.19	0.13	0.01	0.04	-0.05	-0.14	1.00							
frac	0.15	0.20	0.00	0.23	-0.24	0.00	-0.01	0.05	-0.13	-0.29	0.15	0.31	0.34	-0.09	-0.34	-0.23	-0.17	-0.25	-0.54	1.00						
polariz	-0.03	0.12	-0.12	0.13	-0.16	-0.07	-0.13	0.01	-0.14	-0.29	-0.10	0.19	0.38	-0.28	-0.26	-0.29	-0.29	-0.35	-0.34	0.61	1.00					
stabns	0.24	0.31	0.16	0.43	0.01	0.18	0.23	0.27	0.18	0.14	0.40	0.67	0.30	0.12	0.15	-0.01	-0.10	0.00	-0.29	0.31	0.18	1.00				
MinCiv	0.08	0.06	0.18	0.08	0.09	0.19	0.20	0.11	0.20	0.20	0.12	0.07	-0.06	0.22	0.16	0.23	0.22	0.24	0.00	-0.07	-0.18	0.11	1.00			
MedCiv	0.23	0.09	0.48	0.20	0.12	0.13	0.48	0.14	0.01	0.00	0.06	0.03	-0.03	-0.01	0.13	0.34	0.26	0.36	-0.07	-0.01	-0.06	0.05	0.06	1.00		
CivWar	0.46	0.09	0.74	0.20	0.00	0.14	0.63	0.10	0.21	0.17	0.14	0.03	-0.08	0.13	0.24	0.38	0.28	0.54	-0.16	-0.03	-0.09	0.11	0.08	0.28	1.00	
Bregichang	0.07	0.07	0.17	0.11	0.07	0.05	0.31	-0.01	0.46	0.51	0.21	0.12	-0.17	0.31	0.27	0.29	0.34	0.43	-0.14	-0.11	-0.18	0.08	0.19	0.08	0.25	1.00

Appendix C. Correlation matrix of independent variables

	GDP Cap	Investment	Schooling	Pop growth	aggression	protest	regime	within
Gdp per cap	1.00							
Investment	0.25	1.00						
Sec. School enrol.	0.71	0.24	1.00					
Pop growth	-0.57	-0.16	-0.56	1.00				
aggression	-0.34	-0.20	-0.20	0.23	1.00			
protest	-0.26	0.02	-0.10	0.17	0.29	1.00		
regime	-0.65	-0.25	-0.54	0.43	0.36	0.42	1.00	
within	0.38	-0.12	0.33	-0.37	0.03	-0.10	-0.14	1.00

Notes: independent variables are in natural logarithms. Correlation coefficients are calculated sample-wise. N=184.

Appendix D. List of Countries

#	Country	notes	#	Country	notes	#	Country	notes
1	ALBANIA	O; -	44	GUYANA	O; *	87	PANAMA	O; *
2	ALGERIA	X1; *	45	HAITI	X2; *	88	PAPUA NEW G	O; *
3	ANGOLA	O; -	46	HONDURAS	O; *	89	PARAGUAY	O; *
4	ARGENTINA	O; *	47	HUNGARY	O; *	90	PERU	O; *
5	AUSTRALIA	O; *	48	ICELAND	X; *	91	PHILIPPINES	O; *
6	AUSTRIA	O; *	49	INDIA	O; *	92	POLAND	O; 2
7	BAHAMAS	X; -	50	INDONESIA	O; *	93	PORTUGAL	O; *
8	BAHRAIN	X; *	51	IRAN	X2; *	94	QATAR	X; -
9	BANGLADESH	X; *	52	IRAQ	O; -	95	ROMANIA	O; 2
10	BELGIUM	O; *	53	IRELAND	O; *	96	RUSSIAN FED	X1; 2
11	BOLIVIA	O; *	54	ISRAEL	O; *	97	SA'U ARABIA	X; -
12	BOTSWANA	O; *	55	ITALY	O; *	98	SENEGAL	O; *
13	BRAZIL	O; *	56	IVORY COAST	O; -	99	SERBIA/MONT	O; 2
14	BRUNEI	X; -	57	JAMAICA	O; *	100	SIERRA LEO	X1; *
15	BULGARIA	O; *	58	JAPAN	O; *	101	SINGAPORE	O; *
16	BURKNA FASO	X2;-	59	JORDAN	X; *	102	SLOVAK REP	O; *
17	CAMEROON	O; *	60	KENYA	O; *	103	SO AFRICA	O; *
18	CANADA	O; *	61	KOREA PR	O; -	104	SOMALIA	X1; -
19	CHILE	X2; *	62	KOREA REP	O; *	105	SPAIN	O; *
20	CHINA PR	O; *	63	KUWAIT	X; 1	106	SRI LANKA	O; *
21	COLOMBIA	O; *	64	LEBANON	O; -	107	SUDAN	O; 2
22	CONGO DR	X1; *	65	LIBERIA	O; -	108	SURINAME	X2; -
23	CONGO REP	O; 2	66	LIBYA	X; -	109	SWEDEN	O; *
24	COSTA RICA	O; *	67	LUXEMBOURG	X; -	110	SWITZERLAND	X; *
25	CUBA	O; -	68	MADAGASCAR	O; -	111	SYRIA	O; *
26	CYPRUS	X; -	69	MALAWI	O; *	112	TAIWAN	X2; -
27	CZECH REP	O; 2	70	MALAYSIA	X; *	113	TANZANIA	O; 2
28	DENMARK	O; *	71	MALI	O; *	114	THAILAND	X; *
29	DOMIN REP	O; *	72	MALTA	X; -	115	TOGO	O; *
30	ECUADOR	O; *	73	MEXICO	O; *	116	TRINIDAD	O; *
31	EGYPT	O; *	74	MONGOLIA	O; -	117	TUNISIA	O; *
32	EL SALVADOR	O; *	75	MOROCCO	X; -	118	TURKEY	O; *
33	ETH'PIA FDR	O; -	76	MOZAMBIQUE	O; *	119	UA EMIRATES	X; -
34	FINLAND	O; *	77	MYANMAR	X1; -	120	UGANDA	O; *
35	FRANCE	O; *	78	NAMIBIA	X2; 2	121	UK	O; *
36	GABON	O; -	79	NETHERLANDS	O; *	122	URUGUAY	O; *
37	GAMBIA	X1; *	80	NEW ZEALAND	O; *	123	US	O; *
38	GERMANY	O; *	81	NICARAGUA	O; *	124	VENEZUELA	X1; *
39	GHANA	X2; *	82	NIGER	X2; *	125	VIETNAM	O; 2
40	GREECE	O; *	83	NIGERIA	X; -	126	YEMEN REP	X2; 2
41	GUATEMALA	O; *	84	NORWAY	O; *	127	ZAMBIA	O; *
42	GUINEA	X2; -	85	OMAN	X; -	128	ZIMBABWE	O; *
43	GUINEA-B'AU	O; *	86	PAKISTAN	O; *			

Notes: O= all indicators used in the EFA are available, X1= all indicators used in the EFA are only available for the period 1984-1993 (period 1984-2003 contains some imputed values), X2 = all indicators used in the EFA are only available for the period 1994-2003 (period 1984-1993 contains some imputed values). * = country is included in the sample of the panel regression model of section 6. 1 = all economic control variables are only available for the period 1984-1993. 2 = all economic control variables are only available for the period 1994-2003. - = both periods contain missing values for the economic control variables.

Appendix E. Political instability factor scores.

country	violence		protest		regime		within	
	84-93	94-03	84-93	94-03	84-93	94-03	84-93	94-03
ALBANIA	-0.78	-0.55	1.22	0.48	1.58	0.49	-0.15	0.92
ALGERIA	-0.45	1.82	0.50	-0.41	1.66	1.88	-1.11	0.60
ANGOLA	2.16	1.63	-0.54	-0.52	0.65	0.32	-1.60	-1.37
ARGENTINA	-0.27	-0.65	0.05	1.61	-0.68	-0.17	1.11	2.79
AUSTRALIA	-0.62	-0.55	-0.54	-0.73	-0.75	-1.27	0.54	0.26
AUSTRIA	-0.61	-0.59	-0.57	-0.48	-1.33	-1.21	0.38	0.97
BAHAMAS	-0.48	-0.48	-0.57	-0.63	-0.54	-0.49	-0.17	-0.27
BAHRAIN	-0.30	-0.50	-0.40	-0.11	-0.03	-0.72	-1.95	-0.99
BANGLADESH	0.03	-0.35	1.18	1.22	1.78	-0.22	-0.20	1.18
BELGIUM	-0.48	-0.54	-0.52	-0.53	-0.62	-1.24	0.68	0.58
BOLIVIA	0.06	-0.35	0.05	0.80	0.13	-0.37	1.25	1.49
BOTSWANA	-0.50	-0.63	-0.35	-0.49	-0.65	-0.84	-1.31	-0.75
BRAZIL	-0.46	-0.43	-0.06	0.45	0.41	-1.03	1.05	0.96
BRUNEI	-0.48	-0.60	-0.51	-0.44	-0.68	-1.01	-1.44	-1.41
BULGARIA	-0.65	-0.35	0.42	-0.10	0.84	-0.74	0.31	0.80
BURKNA FASO	-0.13	-0.44	-0.56	-0.44	1.28	0.05	0.20	-0.75
CAMEROON	-0.30	-0.35	0.03	-0.45	1.07	-0.38	-1.54	-1.20
CANADA	-0.56	-0.50	-0.45	-0.44	-0.44	-0.96	0.54	-0.38
CHILE	0.30	-0.57	2.17	-0.31	0.07	-1.06	-0.41	0.93
CHINA PR	-0.63	-0.69	1.88	1.84	-0.36	-0.73	-1.49	-1.81
COLOMBIA	2.67	5.41	-0.48	-0.37	-0.33	-1.09	0.94	1.60
CONGO DR	0.13	0.35	0.94	0.37	2.81	2.78	-1.16	0.16
CONGO REP	-0.43	-0.05	-0.25	-0.52	1.14	1.13	-0.79	0.04
COSTA RICA	-0.51	-0.57	-0.33	-0.52	-0.49	-0.91	0.36	1.22
CUBA	-0.47	-0.62	-0.41	-0.13	-0.44	-0.84	-1.68	-1.80
CYPRUS	-0.35	-0.41	-0.53	-0.60	-0.37	-0.92	0.12	0.13
CZECH REP	-0.71	-0.56	0.96	-0.86	0.83	-0.98	0.14	1.40
DENMARK	-0.60	-0.58	-0.75	-0.88	-1.39	-1.36	0.88	0.98
DOMIN REP	-0.36	-0.45	0.51	0.30	-0.46	-0.79	0.21	0.30
ECUADOR	-0.34	-0.45	-0.11	0.73	-0.74	0.72	1.76	2.63
EGYPT	0.13	-0.13	0.02	-0.42	-0.17	-0.64	-1.05	-1.08
EL SALVADOR	2.48	-0.54	-0.30	-0.40	0.05	-1.27	0.45	0.65
ETH'PIA FDR	0.86	1.58	-0.46	-0.31	-0.19	2.31	-0.95	-0.79
FINLAND	-0.62	-0.61	-0.83	-0.87	-1.32	-1.43	0.83	0.79
FRANCE	-0.48	-0.51	0.90	0.64	-0.87	-1.02	1.00	1.08
GABON	-0.48	-0.53	-0.03	-0.43	0.00	-0.25	-1.41	-1.03
GAMBIA	-0.48	-0.58	-0.40	-0.53	-0.04	1.02	-1.37	-0.54
GERMANY	-0.55	-0.57	1.00	-0.49	-1.06	-1.42	-0.12	0.44
GHANA	-0.37	-0.45	-0.46	-0.55	0.50	-0.38	-1.20	-0.36
GREECE	-0.23	-0.54	-0.25	-0.56	-0.34	-0.73	1.36	0.29
GUATEMALA	2.17	0.73	0.36	-0.10	1.50	-0.34	1.86	0.60
GUINEA	-0.36	-0.29	-0.41	-0.53	1.68	0.11	-0.37	-0.91
GUINEA-B'AU	-0.38	-0.18	-0.30	-0.56	1.33	2.03	-1.47	0.90
GUYANA	-0.29	-0.46	-0.43	-0.22	0.41	-0.18	-0.62	0.61
HAITI	-0.16	0.05	0.94	1.60	4.79	0.79	2.33	0.88
HONDURAS	0.56	-0.27	-0.18	-0.20	-0.19	-0.40	0.34	0.80

HUNGARY	-0.70	-0.58	0.21	-0.76	0.27	-0.80	0.25	1.24
ICELAND	-0.61	-0.61	-0.88	-0.86	-1.24	-1.55	1.01	0.44
INDIA	5.40	1.71	5.34	0.02	-0.34	-0.27	1.18	1.77
INDONESIA	0.93	0.44	0.06	3.83	-0.35	0.48	-1.64	0.09
IRAN	-0.11	-0.36	-0.14	0.63	0.65	-0.53	-1.25	-1.33
IRAQ	1.92	0.93	-0.11	-0.30	0.40	0.82	-1.94	-1.93
IRELAND	-0.50	-0.61	-0.64	-0.65	-0.80	-1.17	0.97	0.64
ISRAEL	1.02	0.90	2.35	1.36	-0.13	-0.22	1.35	1.61
ITALY	-0.43	-0.56	-0.15	-0.57	-0.04	-0.12	2.75	2.84
IVORY COAST	-0.54	-0.30	0.05	0.41	0.08	1.31	-1.31	-0.16
JAMAICA	-0.41	-0.51	-0.25	0.24	-0.15	-0.98	-0.56	-0.88
JAPAN	-0.70	-0.67	-0.21	-0.63	-0.34	-0.14	1.51	2.84
JORDAN	-0.10	-0.56	-0.42	-0.44	0.25	-0.41	-0.56	-0.09
KENYA	-0.32	-0.45	0.23	0.37	0.10	-0.28	-1.59	-0.64
KOREA PR	-0.68	-0.69	-0.20	-0.32	-0.46	-0.43	-1.24	-1.42
KOREA REP	-0.69	-0.58	6.14	0.05	-0.21	-0.69	0.33	0.69
KUWAIT	-0.33	-0.52	-0.21	-0.64	1.38	-0.92	-1.42	-0.18
LEBANON	2.59	-0.51	0.01	-0.53	2.69	0.56	0.94	0.23
LIBERIA	0.96	0.74	-0.34	-0.39	2.20	3.04	-0.84	1.25
LIBYA	-0.21	-0.50	-0.42	-0.42	0.17	-0.13	-1.73	-1.40
LUXEMBOURG	-0.60	-0.62	-0.80	-0.75	-1.39	-1.36	0.18	0.00
MADAGASCAR	-0.17	-0.39	0.24	-0.46	0.48	0.10	-0.64	1.08
MALAWI	-0.39	-0.50	-0.13	-0.58	0.59	0.00	-1.66	-0.25
MALAYSIA	0.26	-0.56	-0.46	-0.24	-0.67	-1.03	-0.70	-0.13
MALI	-0.49	-0.40	-0.18	-0.62	2.24	-0.37	-0.25	-0.39
MALTA	-0.39	-0.62	-0.35	-0.75	-0.09	-0.98	-0.14	0.35
MEXICO	-0.32	2.64	0.17	1.25	-0.80	-0.63	-0.92	0.54
MONGOLIA	-0.76	-0.58	0.23	-0.58	0.67	-0.66	-0.89	-0.22
MOROCCO	0.42	-0.47	-0.47	-0.64	-0.49	-0.75	-0.62	0.30
MOZAMBIQUE	1.23	-0.40	-0.53	-0.38	0.38	-0.61	-1.15	-1.06
MYANMAR	2.47	1.23	0.50	0.31	1.24	-0.34	-0.80	-1.27
NAMIBIA	0.00	-0.56	0.00	-0.60	0.00	-1.14	0.00	-0.81
NETHERLANDS	-0.57	-0.61	-0.81	-0.83	-1.52	-1.27	0.04	1.39
NEW ZEALAND	-0.65	-0.63	-0.74	-0.65	-0.51	-0.79	1.22	1.05
NICARAGUA	2.21	0.21	0.47	-0.21	0.75	-0.59	-0.28	0.54
NIGER	-0.38	-0.49	-0.21	-0.49	2.59	2.31	-0.45	1.32
NIGERIA	-0.25	0.29	0.07	0.72	2.24	1.17	-0.30	-0.03
NORWAY	-0.63	-0.61	-0.91	-0.82	-1.11	-0.94	1.49	1.63
OMAN	-0.41	-0.66	-0.46	-0.40	-0.40	-0.59	-1.73	-1.54
PAKISTAN	-0.04	-0.38	1.87	1.10	2.10	1.24	1.98	1.61
PANAMA	-0.27	-0.49	0.58	-0.43	0.89	-0.73	1.48	0.33
PAPUA NEW G	0.30	0.35	-0.62	-0.55	0.13	0.11	1.06	2.43
PARAGUAY	-0.68	-0.55	0.06	0.62	0.91	0.22	-0.34	0.65
PERU	3.29	1.95	-0.39	0.63	0.83	0.09	0.88	1.39
PHILIPPINES	4.01	1.40	2.05	-0.54	0.85	-0.73	0.17	0.68
POLAND	-0.64	-0.61	1.98	-0.49	0.72	-0.58	-0.30	1.07
PORTUGAL	-0.48	-0.63	-0.73	-0.85	-0.76	-1.11	0.52	1.16
QATAR	-0.38	-0.60	-0.44	-0.66	-0.14	-0.55	-1.68	-0.58
ROMANIA	-0.62	-0.49	0.93	-0.58	0.97	-0.49	-0.38	1.10
RUSSIAN FED	-0.84	1.74	6.16	0.27	1.07	-0.35	-0.75	1.29

SA'U ARABIA	-0.35	-0.56	-0.40	-0.29	-0.20	-0.61	-1.86	-1.75
SENEGAL	-0.44	-0.30	-0.13	-0.41	0.10	0.69	-1.27	-0.36
SERBIA/MONT	-0.26	0.51	2.79	1.76	1.46	0.29	-0.38	0.74
SIERRA LEO	-0.36	1.30	-0.41	-0.57	1.38	3.27	-0.73	1.06
SINGAPORE	-0.70	-0.71	-0.47	-0.45	-0.52	-0.86	-0.81	-1.43
SLOVAK REP	-0.71	-0.57	0.98	-0.78	0.83	-0.58	-0.07	1.17
SO AFRICA	0.89	-0.55	6.59	-0.31	-0.29	-0.33	-1.00	-0.03
SOMALIA	2.09	0.83	-0.03	0.10	2.13	1.95	-1.17	-1.68
SPAIN	0.54	0.64	0.40	-0.08	-0.80	-1.07	-0.51	0.32
SRI LANKA	3.11	3.07	-0.29	-0.74	0.55	-0.36	-0.71	0.15
SUDAN	2.64	3.19	-0.10	-0.52	4.21	0.59	0.04	-1.73
SURINAME	0.73	-0.47	-0.53	-0.33	1.12	-0.73	0.78	0.37
SWEDEN	-0.58	-0.58	-0.89	-0.89	-1.22	-1.08	1.16	1.34
SWITZERLAND	-0.59	-0.57	-0.75	-0.80	-1.67	-1.61	0.08	0.06
SYRIA	-0.36	-0.64	-0.50	-0.61	-0.27	-1.26	-1.26	-0.64
TAIWAN	-0.75	-0.71	0.40	0.16	0.20	-0.48	-1.20	-0.31
TANZANIA	-0.37	-0.57	-0.50	-0.20	0.30	-0.16	-0.57	-0.80
THAILAND	0.57	-0.62	-0.29	-0.45	1.92	0.23	1.03	0.80
TOGO	-0.21	-0.38	0.43	-0.58	1.46	-0.03	-0.92	-0.06
TRINIDAD	-0.32	-0.38	-0.45	-0.72	0.15	-0.50	-0.23	0.76
TUNISIA	-0.42	-0.58	-0.32	-0.59	0.20	-0.84	-0.60	-0.84
TURKEY	1.25	1.86	-0.73	-0.39	0.27	-0.23	0.88	1.41
UA EMIRATES	-0.24	-0.57	-0.33	-0.49	0.22	-0.90	-2.08	-1.52
UGANDA	1.76	0.13	-0.72	-0.63	1.66	-0.15	-0.74	-0.81
UK	1.42	-0.04	0.92	0.21	-0.98	-0.92	-0.10	-0.15
URUGUAY	-0.28	-0.50	0.10	-0.67	0.07	-0.83	0.90	0.61
US	-0.61	-0.58	0.24	-0.15	-1.23	-1.36	0.62	0.30
VENEZUELA	-0.37	-0.42	0.14	1.60	-0.30	-0.55	1.12	1.28
VIETNAM	-0.22	-0.70	-0.28	-0.39	0.34	-0.76	-0.59	-1.04
YEMEN REP	0.00	-0.33	0.00	-0.62	0.00	-0.09	0.00	-0.65
ZAMBIA	-0.43	-0.47	-0.14	-0.40	0.46	-0.32	-1.00	-0.36
ZIMBABWE	0.15	-0.42	-0.44	0.12	0.13	-0.53	-0.81	-1.30