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

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Abstract:

Using an exploratory factor analysis we identify four dimensions of political instability: (1) 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, in turn, 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 the number of 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). Others 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; 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. However, the results of these studies differ substantially ranging from two dimensions (Hibbs, 1971) to nine

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

dimensions (Feierabend and Feierabend, 1966).[2] Furthermore, a number of studies differentiate between different dimensions of political instability on *a priori* grounds and select a group of indicators to represent that particular dimension.[3]

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 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 long-term economic growth for a sample of 98 countries in the period 1984-2003.

We find that political instability has four dimensions: 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 long run economic growth.

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

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[2] Other studies that also address the dimensionality of political instability using PCA 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.

[3] Examples include Campos and Nugent (2002) who differentiate between moderate and severe political instability and Chauvet (2002) who differentiates between unrest, collective rebellion and executive (or elite) instability.

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. This problem is acknowledged by various authors. 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). 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; Feng, 1997). 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. For instance, Cukierman (1994), has shown that frequent changes in government have different consequences for the desired amount of legal independence of the central bank compared to frequent changes of the political regime.

In order to examine the multidimensional character of political instability we employ factor analysis. Although this method is similar 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.[4]

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

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

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:

$$y_n = B\xi_n + \varepsilon_n$$

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:

$$\Sigma = B\Phi B' + \Omega$$

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 the equation 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.[5]

We estimate the factor loadings and the unique variances with the method of Maximum Likelihood. Assuming the indicators are normally distributed we write the likelihood function:

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

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

[5] 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.

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 latent variables, 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:

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

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

Our dataset is constructed as follows. First, we collected as many indicators as possible that proxy for political instability. The main sources for political instability indicators are:

- *The Banks Cross National Time Series Archive*
- *The International Country Risk Guide*
- *The Polity IV* dataset
- *The International Peace Research Institute Oslo* (PRIO)
- *The Database of Political Institutions* of the World Bank (DPI)

We were confronted with a number of problems constructing the dataset. Firstly, indicators about elections and replacement of governments and political leaders are available in both the Banks data archive and the DPI dataset. Because the first dataset contains more observations we rely on this dataset for our analysis. Secondly, a number of available indicators are based on each other and therefore are correlated not only because they possibly reflect the same phenomenon, but also because the 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 EFA model.[6] Thirdly, the PRIO includes a variable reflecting how severe internal conflicts are on a 0-3 scale. Since the scale of this variable is not ordinal, we constructed three dummy variables that reflect the severity of internal conflicts out of this index .

Next, we selected the time period for which all indicators were available. The ICRG indicators are only available from 1984 onwards and hence restrict our dataset to the period 1984-2003. Since the indicators of political instability are only regarded as valid proxies when they are averaged over a longer time period (Durlauf, Johnson and Temple, 2004), we calculated 10-year averages of the indicators. A problem we encountered for

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

some variables is missing data. Not all indicators are available for all countries in all years. Therefore, we only included the 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 are 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.[7]

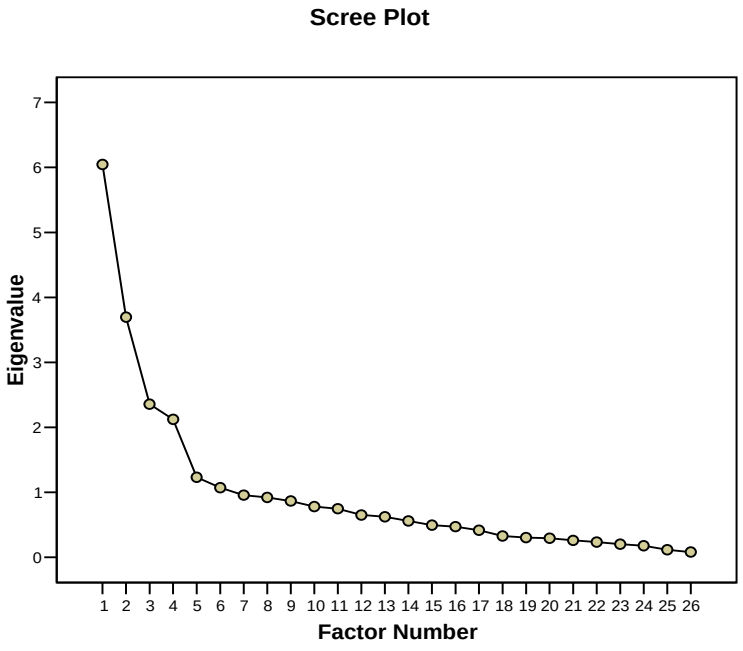
In sum: we have 10-year averages for 26 political instability indicators which are available for 128 countries for the period 1984-2003. These indicators (and their definitions) can be found in appendix A. The appendix also contains information about the studies that have used one or more indicators of political instability. 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 the screeplot which plots the number of factors against the eigenvalues of the covariance matrix of the indicators.

[7] 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 varies between 0.91 and 0.99. 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 vary between (0.97 and 0.999). 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.[8] 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 839.85 which is $\chi^2(227)$ distributed and is highly significant at the five 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.

[8] 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				
Indicator	**Aggression**	**Protest**	**Within**	**Regime**	**unique variance**
Guerilla	0.96	0.05	0.01	-0.07	0.10
Civil War	0.78	-0.07	-0.01	0.04	0.39
Revolutions	0.75	-0.03	0.07	0.19	0.31
Assassinations	0.62	0.10	0.20	-0.12	0.57
Internal Conflicts (ICRG)	0.53	-0.02	-0.18	0.47	0.31
Medium Civil Conflicts	0.52	0.04	-0.03	-0.06	0.74
Ethnic tensions (ICRG)	0.36	0.09	-0.22	0.42	0.52
Demonstrations	0.04	0.94	0.10	-0.09	0.11
Riots	0.12	0.84	0.01	-0.08	0.28
Strikes	0.07	0.46	0.31	0.04	0.64
Executive Changes	-0.09	0.10	0.74	0.37	0.35
Veto players who drop from office	0.02	0.14	0.67	0.21	0.47
Fractionalization	0.06	-0.06	0.66	-0.29	0.46
years of ruling party in office	-0.19	0.29	-0.55	-0.04	0.61
Polarization	-0.05	-0.05	0.52	-0.37	0.56
Number of elections	-0.06	0.12	0.49	-0.19	0.69
Government crises	0.16	0.22	0.48	0.20	0.58
Major constitutional changes	-0.13	0.06	0.00	0.82	0.36
Coups d'etat	-0.05	-0.14	0.12	0.67	0.59
Regime Changes (Polity)	0.02	0.11	0.00	0.60	0.59
Regime Changes (Banks)	0.07	-0.11	0.01	0.57	0.66
Government instability (ICRG)	0.16	0.07	-0.07	0.53	0.60
Cabinet Changes	-0.03	0.14	0.44	0.51	0.53
Religious Tensions (ICRG)	0.20	0.02	-0.19	0.32	0.77
Minor Civil Conflicts	0.10	0.09	-0.04	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 *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 can explain 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 in table 2.

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

Indicator	Aggression	Protest	Within	Regime
Guerilla	0.95	0.22	0.07	0.25
Civil War	0.78	0.08	0.02	0.28
Revolutions	0.81	0.15	0.10	0.42
Assasinations	0.61	0.20	0.25	0.08
Internal Conflicts (ICRG)	0.67	0.16	-0.19	0.65
Medium Civil Conflicts	0.50	0.13	0.00	0.12
Ethnic tensions (ICRG)	0.50	0.23	-0.22	0.57
Riots	0.25	0.84	0.08	0.13
Strikes	0.19	0.51	0.34	0.14
Demonstrations	0.20	0.93	0.17	0.11
Major constitutional changes	0.15	0.21	-0.06	0.79
Regime Changes (Polity)	0.23	0.24	-0.03	0.63
Regime Changes (Banks)	0.24	0.03	-0.03	0.57
Religious Tensions (ICRG)	0.30	0.11	-0.20	0.41
Government instability (ICRG)	0.35	0.21	-0.09	0.61
Cabinet Changes	0.19	0.27	0.41	0.50
Polarization	-0.15	-0.10	0.53	-0.42
Coups d'etat	0.15	-0.01	0.06	0.61
Executive Changes	0.09	0.21	0.71	0.31
Government crises	0.30	0.33	0.49	0.27
Fractionalization	-0.01	-0.06	0.68	-0.33
Veto players who drop from office	0.15	0.23	0.67	0.21
Number of elections	-0.07	0.10	0.51	-0.22
years that ruling party in office	-0.17	0.21	-0.53	0.00
Minor Civil Conflicts	0.19	0.16	-0.04	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 (0.71). 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 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.

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.

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. In our view, four patterns stand out from these rankings. 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 has a very high ranking on the *Within* dimension but does not enter the top 10 of any other dimension.[9] Secondly, a high score in 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 countries are primarily associated with instability of the political regime, Asian and Latin

[9] In fact, Italy's highest ranking on the other three dimensions is position 33 on the *regime* dimension in the period 1994-2003 (not shown in this draft version).

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	5.35	SO AFRICA	6.55	ITALY	2.73	HAITI	4.85
2	PHILIPPINES	4.01	RUSSIAN FED	6.13	HAITI	2.21	SUDAN	4.19
3	PERU	3.29	KOREA REP	6.13	PAKISTAN	1.90	CONGO DR	2.79
4	SRI LANKA	3.12	INDIA	5.38	GUATEMALA	1.82	LEBANON	2.72
5	SUDAN	2.67	SERBIA/MONT	2.77	ECUADOR	1.77	NIGER	2.58
6	COLOMBIA	2.66	ISRAEL	2.38	NORWAY	1.52	MALI	2.23
7	LEBANON	2.59	CHILE	2.15	JAPAN	1.50	NIGERIA	2.23
8	EL SALVADOR	2.49	PHILIPPINES	2.04	PANAMA	1.44	LIBERIA	2.18
9	MYANMAR	2.47	POLAND	1.96	GREECE	1.36	PAKISTAN	2.15
10	NICARAGUA	2.21	PAKISTAN	1.92	ISRAEL	1.32	SOMALIA	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	5.39	INDONESIA	3.82	JAPAN	2.83	SIERRA LEO	3.29
2	SUDAN	3.20	CHINA PR	1.78	ITALY	2.82	LIBERIA	3.07
3	SRI LANKA	3.07	SERBIA/MONT	1.77	ARGENTINA	2.74	CONGO DR	2.79
4	MEXICO	2.62	ARGENTINA	1.69	ECUADOR	2.60	NIGER	2.34
5	PERU	1.93	VENEZUELA	1.63	PAPUA NEW G	2.43	ETH'PIA FDR	2.29
6	ALGERIA	1.87	HAITI	1.62	INDIA	1.78	SOMALIA	2.06
7	TURKEY	1.85	ISRAEL	1.40	NORWAY	1.65	GUINEA-B'AU	2.05
8	RUSSIAN FED	1.74	MEXICO	1.26	COLOMBIA	1.63	ALGERIA	1.87
9	INDIA	1.70	BANGLADESH	1.26	ISRAEL	1.59	IVORY COAST	1.31
10	ANGOLA	1.63	PAKISTAN	1.14	PAKISTAN	1.57	PAKISTAN	1.28

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	-0.85	NORWAY	-0.87	UA EMIRATES	-2.07	SWITZERLAND	-1.67
2	ALBANIA	-0.78	ICELAND	-0.85	IRAQ	-1.94	NETHERLANDS	-1.52
3	MONGOLIA	-0.76	SWEDEN	-0.85	BAHRAIN	-1.93	LUXEMBOURG	-1.38
4	TAIWAN	-0.75	NETHERLANDS	-0.80	SA'U ARABIA	-1.84	DENMARK	-1.37
5	JAPAN	-0.72	FINLAND	-0.80	LIBYA	-1.72	AUSTRIA	-1.32
6	SLOVAK REP	-0.71	LUXEMBOURG	-0.79	OMAN	-1.72	FINLAND	-1.30
7	CZECH REP	-0.71	UGANDA	-0.75	QATAR	-1.67	ICELAND	-1.26
8	KOREA REP	-0.71	SWITZERLAND	-0.75	CUBA	-1.67	US	-1.22
9	HUNGARY	-0.70	DENMARK	-0.72	MALAWI	-1.67	SWEDEN	-1.19
10	SINGAPORE	-0.70	PORTUGAL	-0.71	INDONESIA	-1.63	NORWAY	-1.08

Period: 1994-2003

Dimension:	**Violence**		**Protest**		**Within**		**Regime**	
rank	Country	factor score	Country	factor score	Country	factor score	Country	factor score
1	TAIWAN	-0.72	ICELAND	-0.85	SOMALIA	-1.96	SWITZERLAND	-1.61
2	SINGAPORE	-0.71	SWEDEN	-0.85	IRAQ	-1.93	ICELAND	-1.58
3	VIETNAM	-0.70	DENMARK	-0.85	CHINA PR	-1.83	GERMANY	-1.41
4	CHINA PR	-0.69	FINLAND	-0.84	CUBA	-1.78	FINLAND	-1.41
5	KOREA PR	-0.69	PORTUGAL	-0.82	SA'U ARABIA	-1.73	LUXEMBOURG	-1.36
6	JAPAN	-0.69	CZECH REP	-0.81	SUDAN	-1.70	US	-1.36
7	ARGENTINA	-0.67	SWITZERLAND	-0.79	OMAN	-1.53	DENMARK	-1.34
8	OMAN	-0.65	NETHERLANDS	-0.79	UA EMIRATES	-1.50	SYRIA	-1.28
9	SYRIA	-0.64	NORWAY	-0.77	KOREA PR	-1.42	AUSTRALIA	-1.27
10	NEW ZEALAND	-0.64	LUXEMBOURG	-0.74	SINGAPORE	-1.41	EL SALVADOR	-1.26

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 an explanatory variable is (long run) economic growth. Examples include Gupta (1990), Barro (1991), Levine and Renelt (1992), Alesina et al. (1996), Sala-i-Martin (1997) Chen and Feng (1997), Doppelhofer et al. (2004) and Sturm and de Haan (2005).

To examine the effect that the 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)[10] who derive the specification of their empirical model from the Solow (1956) model. As the model is used for illustrative purposes only, we do not intensively examine the robustness of our results nor do we address the possibility reverse causality between political instability and economic growth.[11]

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 domestic investment relative to GDP for country i in period t, *Secondary School*

[10] 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.

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

Enrollment (the percentage of the population above 15 that started with secondary schooling in country *i* at the start of period *t*)[12] 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".[13] 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 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. Finally, we also checked whether the disturbance term is heteroscedastic. A White test gives a test statistic of 7.19 which is $\chi^2(7)$ distributed.[14] Hence, the null-hypothesis of homoscedastic disturbances cannot be rejected.

Our estimation results are shown in table 4.

[12] 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.

[13] 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.

[14] The White test is based on an auxilliary regression of the squared residuals on the regressors. The test statistic is obtained by multiplying the R-squared of the regression with the number of observations. The statistic reported here is based on the model when all dimensions of political instability are included. All other models could also not reject the null-hypothesis of homoscedastic disturbances.

Table 4. Estimation Results

Dependent variable Real GDP Growth per capita	**(I)**	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**
GDP per capita (begin of period)	-0.04	-0.04	-0.04	-0.04	-0.04	-0.05	-0.05
	(-4.81)*	(-4.89)*	(-4.93)*	(-5.39)*	(-4.76)*	(-6.01)*	(-5.90)*
Investment	0.03	0.03	0.03	0.03	0.03	0.02	0.02
	(3.12)*	(2.69)*	(2.64)*	(3.29)*	(3.40)*	(1.85)**	(2.27)*
Secondary school enrollment	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(2.28)*	(2.37)*	(2.10)*	(1.81)**	(1.84)**	(1.43)	(0.91)
Population Growth	-0.21	-0.25	-0.16	-0.20	-0.04	0.16	0.21
	(-0.44)	(-0.53)	(-0.33)	(-0.46)	(-0.08)	(0.35)	(0.48)
Revolutions and Coups		-0.01					
		(-1.57)					
Aggression			0.00				0.00
			(-1.19)				(-0.31)
Protest				-0.01			-0.01
				(-3.82)*			(-2.38)*
Within					0.01		0.01
					(1.49)		(1.23)
Regime						-0.02	-0.02
						(-3.93)*	(-2.82)*
Within R-Squared	0.32	0.34	0.33	0.43	0.34	0.43	0.49
Observations	184	184	184	184	184	184	184
Countries	98	98	98	98	98	98	98
F-test Fixed Effects	2.12	2.12	2.15	2.58	2.17	2.29	2.55
Hausman test	22.31	22.44	23.83	35.04	26.94	32.73	47.51

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 column, we show the model estimates when a frequently used variable (i.e. the sum of revolutions and coups) is used as a proxy for political instability. Since the model is estimated in natural logarithms we can interpret the estimated coefficients as elasticities. It can be seen that the estimated elasticity of this proxy for political instability is -0.01 and is not

significantly different from zero. Furthermore, the increase of the (within) R-squared of this model relative to the baseline specification is very small and therefore one can have reasonable doubts whether using individual indicators contribute anything to the understanding of the relationship between political instability and economic growth. Columns 3-6 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 and variables are used to proxy for political instability. 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.[15] 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 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, sample heterogeneity 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.

[15] The test statistic is 2.98 and F(3,78) distributed. The p-value is 0.0364.

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Appendix A. List of variables, definitions, sources and studies

Indicator	definition	Source	used by
Assas	Any politically motivated murder or attempted murder of a high government official or politician	Banks (2005)	Barro (1991),A&P (1996), Perotti (1996), Gupta (1990), Schatzman (2005), CQZ (2003), C&F (1996), C&N (2002), Annett (2000), E&L (1997), Chauvet (2002), Svensson (1998)
cabchang	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)	C&F (1996), A&V (2006), Annett (2000), E&L (1997), Siermann (1998)^^, Sanders (1981), Svensson (1998), Volkerink (1999), DBS (1999)
CivWar	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)	(A&P, Perotti (1996), Gupta (1990), C&F (1996), V&G (1986), Svensson (1998))* , Annett (2000)***, E&L (1997), Chauvet (2002),
coups	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)	A&P (1996), Perotti (1996), Gupta (1990), C&N (2002), Annett (2000), E&L (1997), Chauvet (2002), Siermann (1998), SIM(1997, 2004)
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)	F&S (2003), A&V (2006), Annett (2000), E&L (1997), Chauvet (2002)
demons	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)	Gupta (1990), Schatzman (2005), CQZ (2003), E&L(1997), V&G (1986), Chauvet (2003)
ethtension	An asssasment of the degree of tensions within a country which is attributable to racial, nationality or language divisions	ICRG	C&F (1996)*, E&L(1997)**, K&K(1995)
execchang	The number of times in a year that effective control of the executive Dower changes hands.	Banks (2005)	C&F (1996), Siermann (1998), Sanders (1981), Svensson (1998)
frac	The probability that two deputies picked at random from the legislature will be of different parties.	Beck et al. (2001)	…
govstab	An assessment of the governments ability to carry out its declared programs and its ability to stay in office	ICRG	C&F (1996)*
guerilla	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)	Gupta (1990), Schatzman (2005), CQZ (2003), Chauvet (2002)
intcon	an assessment of political violence in the country and its actual or potential impact on governance	ICRG	C&F (1996)*

majchang	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)	C&F (1996), Annett (2000), E&L (1997)
MedCiv	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)	(A&P, P, G, C&F (1996), V&G (1986), Svensson (1998))*
MinCiv	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)	(A&P, P, G, C&F (1996), V&G (1986), Svensson (1998))*
numelect	The number of elections held for the lower house of a national legislature in a given year.	Banks (2005)	…
polariz	Maximum polarization between the executive party and the four principle parties of the legislature.	Beck et al. (2001)	DLM(2004)****
prtyin	Number of years that the party of the chief executive has been in office	Beck et al. (2001)	Sanders (1981)^
Purges	Number of systematic repressions (or eliminations) by jailing or execution of political opposition within the rank of the regime or the opposition		Gupta (1990), Schatzman (2005), CQZ (2003), E&L(1997), V&G (1986), Chauvet (2003). Checken!
regichange	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	Jagger and Gurr	C&F (1996), Sanders (1981)
Bregichange	Dummy variable, 1 if according to the Banks data archive the type of regime has changed	Banks (2005)	Sanders (1981)
reltension	An assesment of the degree of tensions within a country which is attributable to religious divisions	ICRG	C&F (1996)*
revol	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)	Barro (1991), Schatzman (2005), C&N (2002), Annett (2000), E&L (1997), Chauvet (2002), Siermann (1998), SIM(1997, 2004)
riots	Any violent demonstration or clash of more than 100 citizens involving the use of physical force	Banks (2005)	Gupta (1990), Schatzman (2005), CQZ (2003), C&F (1996), Annett (2000), E&L (1997), Chauvet (2002), Svensson (1998)
stabns	The percent of veto players that drop from the government given the senate does not change	Beck et al. (2001)	…

strike	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)	Gupta (1990), Schatzman (2005), CQZ (2003), Chauvet (2002), Svensson (1998)

Appendix B. Correlation matrix of the indicators

	ASSAS	CABCHANG	CIVWAR	COUPS	CRISES	DEMONS	ETHTENSION	EXECCHANG	FRAC	GOVSTAB	GUERILLA	INTCON	MAJCHANG	MEDCIV	MINCIV	NUMELECT	POLARIZ	PRTYIN	REGICHANGE	REVOL	RIOTS	STABNS	STRIKE	RELTENSION
ASSAS	1.00																							
CABCHANG	0.16	1.00																						
CIVWAR	0.42	0.11	1.00																					
COUPS	-0.04	0.20	0.33	1.00																				
CRISES	0.23	0.44	0.16	0.03	1.00																			
DEMONS	0.21	0.24	0.08	-0.07	0.31	1.00																		
ETHTENSION	-0.06	-0.19	-0.42	-0.27	-0.18	-0.17	1.00																	
EXECCHANG	0.18	0.49	0.00	0.16	0.56	0.20	0.01	1.00																
FRAC	0.15	0.17	-0.09	-0.12	0.27	0.03	0.24	0.40	1.00															
GOVSTAB	-0.14	-0.18	-0.33	-0.28	-0.21	-0.11	0.46	-0.12	0.35	1.00														
GUERILLA	0.61	0.13	0.77	0.14	0.26	0.20	-0.45	0.06	-0.02	-0.33	1.00													
INTCON	-0.36	-0.18	-0.62	-0.30	-0.20	-0.09	0.68	0.03	0.24	0.61	-0.64	1.00												
MAJCHANG	-0.01	0.28	0.19	0.56	0.14	0.16	-0.31	0.18	-0.31	-0.40	0.09	-0.29	1.00											
MEDCIV	0.26	0.08	0.29	0.04	0.24	0.14	-0.34	0.02	0.00	-0.14	0.50	-0.36	-0.06	1.00										
MINCIV	0.06	0.06	0.06	0.23	0.03	0.09	-0.22	0.02	-0.10	-0.06	0.15	-0.21	0.20	0.02	1.00									
NUMELECT	0.08	0.09	-0.19	-0.24	0.09	0.12	0.26	0.26	0.36	0.14	-0.14	0.36	-0.19	-0.08	-0.14	1.00								
POLARIZ	-0.06	-0.08	-0.13	-0.13	0.11	-0.03	0.30	0.21	0.62	0.28	-0.15	0.35	-0.29	-0.04	-0.19	0.39	1.00							
PRTYIN	-0.14	-0.24	-0.16	-0.06	-0.18	0.19	-0.03	-0.28	-0.56	-0.07	-0.12	0.12	0.21	-0.09	0.02	-0.11	-0.36	1.00						
REGICHANGE	0.12	0.24	0.15	0.32	0.22	0.21	-0.31	0.13	-0.13	-0.27	0.20	-0.30	0.60	-0.05	0.20	-0.23	-0.32	0.18	1.00					
REVOL	0.47	0.18	0.64	0.24	0.26	0.17	-0.46	0.08	-0.04	-0.31	0.79	-0.61	0.18	0.51	0.17	-0.12	-0.14	-0.10	0.26	1.00				
RIOTS	0.15	0.23	0.15	-0.03	0.22	0.82	-0.25	0.14	-0.01	-0.13	0.30	-0.14	0.10	0.13	0.18	0.04	-0.09	0.10	0.13	0.10	1.00			
STABNS	0.21	0.36	0.08	0.10	0.43	0.25	0.00	0.64	0.34	-0.09	0.13	0.03	0.10	0.09	0.06	0.20	0.17	-0.27	0.05	0.17	0.16	1.00		
STRIKE	0.20	0.18	0.10	-0.04	0.45	0.47	-0.07	0.29	0.23	-0.25	0.22	-0.19	0.05	0.07	-0.02	0.23	0.13	-0.11	0.07	0.06	0.47	0.29	1.00	
RELTENSION	-0.11	-0.19	-0.35	-0.27	-0.21	-0.12	0.43	-0.06	0.14	0.24	-0.33	0.49	-0.28	-0.31	-0.33	0.17	0.25	0.06	-0.27	-0.28	-0.21	0.00	-0.11	1

Appendix C. Correlation matrix of independent variables

	GDP Cap.	Investment	Schooling	Pop. Growth	aggression	Protest	Within	Regime
GDP Cap.	1.00							
Investment	0.25	1.00						
Schooling	0.71	0.24	1.00					
Pop. Growth	-0.57	-0.16	-0.56	1.00				
aggression	-0.35	-0.20	-0.22	0.25	1.00			
Protest	-0.22	0.02	-0.07	0.14	0.28	1.00		
Within	0.39	-0.11	0.33	-0.38	0.01	-0.06	1.00	
Regime	-0.64	-0.25	-0.53	0.42	0.37	0.40	-0.13	1.00

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

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.