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On economic causes of civil war

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We investigate whether civil wars have economic causes. The model is based on utility theory, rebels will conduct a civil war if the perceived benefits outweigh the costs of rebellion. Using probit and tobit models the propositions are tested empirically. Four variables, initial income, ethno-linguistic fractionalisation, the amount of natural resources, and initial population size are significant and strong determinants of the duration and the probability of civil wars. One important finding is that the relationship between civil wars and ethnic diversity is non-monotonic; highly fractionalised societies have no greater risk of experiencing a civil war than homogenous ones.

1. Introduction

This paper investigates whether civil wars have economic causes. Explanations of particular civil wars often invoke such causes. For example, the war in Rwanda has been attributed to pressure on land, while that in Angola has been interpreted as a contest for natural resources. The subject has not, to our knowledge previously been investigated. A related study by Bennett and Stam (1996) investigates the duration of international wars in terms of political and military variables. We utilise a comprehensive data set of civil wars (Singer and Small, 1982, 1994) and attempt to explain why they occurred in terms of underlying economic variables. Section 2 discusses the variables used in the analysis, basing them on a simple analytic framework. Section 3 presents the results, and Section 4 concludes.

2. Analytic framework

We first set out an analytic framework for the occurrence of civil war, drawing upon Grossman (1995) and Azam (1995). War occurs if the incentive for rebellion is sufficiently large relative to the costs. Both authors propose that in part these will be determined by distributional considerations: a government which rewards its supporters by exploiting a section of the population will increase the incentive for rebellion. However, there is insufficient data to introduce distributional considerations into the empirical analysis, as we discuss below. We therefore focus on those analytic causes of civil war other than distribution.

The objective of rebellion is either to capture the state or to secede from it. In general, the incentive for rebellion is the product of the probability of victory and its consequences. We first consider the determinants of the probability of rebel victory. Abstracting from distributional considerations, the probability of victory depends upon the capacity of the government to defend itself. As Grossman argues, typically, the military technology options available to rebels are fairly narrow, whereas the government faces a wide range of possible technological responses of increasing cost. For example, rebels seldom have the option of aerial combat. The government has the airfields from which to mount such combat and its capacity to use them depends upon its financial resources. In the limit, for a given population the military capability of rebellion is unrelated to the domestic economy (for example, being financed externally), whereas the military capability of the government depends upon its military expenditure. Since both military expenditure and tax rates are endogenous to the risk of rebellion, it is necessary to use some exogenous indicator of the capacity for military expenditure, such as the taxable base. Hence, the probability of rebel victory, p, would be diminishing in the *per capita* taxable base of the economy, T.

Following Grossman, the incentive for rebellion conditional upon victory, is determined by the capacity of a future rebel government to reward its supporters. If the objective of the rebellion is to capture the state, then (again abstracting from distributional considerations), this capacity will be dependent upon the potential revenue of the government and hence of the taxable base, T. Hence, the incentive for rebellion is an increasing function of $p(T) \cdot T$. Since T both reduces the probability of victory and increases the gain in the event of victory, its net effect on the risk of war is *a priori* ambiguous.

If the objective of the rebellion is secession then the taxable base of the pre-secession state is not the determinant of the gains conditional upon victory and distributional considerations are intrinsic. For example, secession might be motivated because the region is atypically well-endowed with resources, or because the preferences of the region are under represented in the government. Although there is insufficient data to introduce geographic inequality as an explanatory variable, one variable which is likely to capture the desire for secession is the size of the population (P). The effect of population size on the desire for secession is most apparent when considered at the extremes. Were the global population contained within a single nation, linguistic and cultural disparities would be likely to generate continuous violent conflicts. By contrast, were there as many nations as socio-cultural groups, the desire for secession would presumably be much diminished.

Although any particular rebel group may be motivated only by one of the potential benefits, state capture and secession, in practice rebellions may consist of groups with each objective. For example, the civil war in Ethiopia included as allies the Tigrean People's Liberation Front, which upon victory took over the state, and the Eritrean People's Liberation Front, which upon victory seceded from the

state. Both potential gains may therefore motivate the same rebellion. The gains from rebellion are thus an increasing function of both $p(T) \cdot T$ and P.

We now turn to the costs of rebellion. First, the actual conduct of civil war is costly to the rebels. This is due partly to the opportunity cost of rebel labour and partly to the disruption to economic activity caused by warfare. Both of these costs can be expected to increase with *per capita* income: a high income population has more to lose than a low income population during rebellion. These costs of rebellion increase with the duration of the conflict. The expected duration of the conflict also affects the gains from rebellion through the discount factor as modelled by Grossman. Hence, the probability of war is diminishing in both the expected duration of conflict (D) and the *per capita* income of the population (Y). We model the expected duration of warfare not as a choice variable for the rebels, but rather as being determined by the military capability of the government (proxied by the taxable capacity of the economy). Thus, a certain expected minimum duration of warfare will be necessary to achieve rebel objectives with the anticipated probability.

The above framework treats the rebels as a single agent. Hirshleifer (1987), while modelling rebellion in this way, acknowledges that it is a deficiency since war-making is the decision of a collective, so that the passage from individual interests to collective decisions should be incorporated. We therefore introduce the costs of coordination into the model. These can be regarded as a transactions cost. We discuss proxies for these transactions costs below.

Formally, the rebel decision on whether to embark on civil war can be set out as

$$W = 1 \text{ if } U_w > 0, \text{ else } W = 0$$

where $W = 1$ is war and $W = 0$ is peace, and U_w is the rebel utility function.

Rebel utility can be specified as

$$U_w = \int_{t=D}^{\infty} \frac{p(T) \cdot G(T,P)}{(1+r)^t} dt - \int_{t=0}^{t=D} \frac{(f(Y)+C}{(1+r)^t} dt \qquad (1)$$

where p = the probability of rebel victory, T = the taxable capacity of the economy, G = gain conditional upon victory, P = the size of the population, D = expected duration of warfare, Y = *per capita* income , C = coordination costs, and r = the discount rate.

Linearising and treating the process as stochastic, a civil war will occur if

$$a \cdot p(T) \cdot T + b \cdot P - c \cdot D - d \cdot Y - e \cdot C > \eta \qquad (2)$$

The maximum expected duration of a civil war conditional upon its occurrence follows from the same formulation

$$D < (a \cdot p(T) \cdot T + b \cdot P - d \cdot Y - e \cdot C - \eta)/c \qquad (3)$$

Hence, if rebels have perfect foresight, so that the expected duration coincides with the actual duration, the observed duration of civil wars will be an increasing function of $p(T) \cdot T$ and P, and a decreasing function of Y and C, just as the probability of the occurrence of war. The resulting formulation makes both the probability of war and its duration outcomes of a single decision process in which

they are each a function of $p(T) \cdot T$, P, Y, and C. Each potential rebel group faces the choice between remaining peaceful and fighting a war with a particular probability of success and a particular expected duration which is necessary to achieve the outcome with the expected probability. Since rebel groups in different countries face different benefits from victory, they will be prepared to accept wars of differing expected durations. Thus, although no single rebel group chooses the duration of war, across all potential rebellions there will be a relationship between the benefits of victory and the necessary duration of warfare which rebels find an acceptable price for victory. This enables us to test the model using both dichotomous data on whether civil wars occur and continuous data on their duration. Since civil wars are infrequent, their econometric analysis solely on the basis of dichotomous information suffers from the low number of observations and so the introduction of a continuous variable should strengthen the results.

If rebels have rational expectations but not perfect foresight then the observed duration of war is a biased predictor of the expected duration. Errors of optimism on the part of rebels will tend to induce war by mistake, and errors of pessimism will tend to produce peace by mistake. Hence, where the expectation is erroneously of a very long war the observation will be war of length zero. Thus, in the extreme case in which rebels always made massive, though unbiased, errors in their forecasts of the duration of warfare, the actual duration would be negatively correlated with the expected duration. If, empirically, the four explanatory variables T, P, Y, and C have the same effects on duration and occurrence this is reasonable evidence that the two are caused by the same underlying process and that errors in expectations of duration are not massive. If the explanatory variables differ as between duration and occurrence the results could variously be interpreted as a rejection of the underlying theory or as indicating large errors in rebel expectations.

We now turn to the construction of proxies for the hypothesised variables.

First consider gains to rebellion, made up of the probability of rebel victory and the gains conditional upon victory. We have suggested that the probability of victory is decreasing in government military expenditure *per capita*, which is in turn a function of the *per capita* taxable capacity of the economy. We proxy taxable capacity by *per capita* income and the natural resource endowment, since the latter is more readily taxable than other components of income. We use the Penn World Tables estimates of *per capita* income in 1960. These correct for international differences in the cost of living. We measure the natural resource endowment by the share of primary exports in GDP, this being the proxy for natural resources used by Sachs and Warner (1995).

Taxable capacity, thus proxied, also enters as the incentive for rebellion, conditional upon the probability of victory, so that its net effect on the probability of war need not be monotonic. We have proposed that a proxy for the benefits of secession is the size of the population.

Now consider the costs of rebellion, namely the loss of income sustained during the conflict and the costs of coordination. The loss of income caused by the

conflict, which is essentially the opportunity cost of labour, is proxied by *per capita* income, measured as above. The costs of coordination are likely to be important because the normal transactions costs associated with collective action are increased in the case of rebellion by the need for secrecy, and the consequent premium upon trust. We proxy the transactions costs of coordinated action partly by cultural distinctness and partly by size. Cultural distinctness is measured by an index of ethno-linguistic fractionalisation. This variable measures the probability that any two citizens will be drawn from a different ethno-linguistic group. The variable is re-scaled so that complete homogeneity scores zero and maximum fragmentation scores 100. It was first utilised by Mauro (1995) to explain the rate of growth. We hypothesise that coordination costs would be at their lowest when the population is polarised between an ethnic group identified with the government and a second, similarly sized ethnic group, identified with the rebels. Rebel coordination would be more difficult both in societies in which the entire population was from the same group, so that there was no obvious distinction between government and rebel supporters, and in societies which were so highly fractionalised that rebellion required coordination across multiple distinct groups. Mapped into the index of ethno-linguistic fractionalisation, this would imply that coordination costs were at their minimum (and hence the risk of civil war at its maximum) in the middle range of the index. The second proxy for the costs of coordination is the size of the population. A rebellion covering a given proportion of the population (and thus, *ceteris paribus*, standing the same change of success), will require communication between a larger number of people in a country with a larger population.

To summarise, we propose a formulation in which both the probability of civil war and its duration are a function of the gains from rebellion, made up of the probability of rebel victory and the gains from victory (state capture or secession), and the costs of rebellion, made up of the opportunity costs of conflict and the cost of coordination. We have proposed four proxies for these variables, namely *per capita* income, the natural resource endowment, population size, and the extent of ethno-linguistic fractionalisation. The first three proxies represent more than one variable so that only their net effect can be measured, and this need not be monotonic.

3. Results

The dependent variables are the occurrence and the duration of civil war. We use the Singer and Small (1982, 1994) data set on civil wars from 1816–1992. Singer and Small (1982) provide an operational definition of civil war. The authors define wars in terms of violence, not in terms of the goals of the protagonists or the results of the war. A civil war in Singer's and Small's (1982) typology is based on four dimensions. First, one of the primary actors in any conflict identified as a civil war must be the national government in power at the time hostilities begin. Secondly, the concept of war requires that both sides have the ability to inflict death upon each other. As a rule of thumb Singer and Small (1982) define that in a civil war the

stronger forces must sustain at least 5% of the number of fatalities suffered by the weaker forces. This rule enables them to distinguish genuine war situations from massacres, pogroms, and purges. Thirdly, significant military action must take place. Only civil wars that resulted in at least 1,000 battle related deaths per year are included in the data set. This figure includes civilian as well as military deaths. Fourthly, the war must be internal to the country. On the Singer and Small definition of internality this produces some important exclusions. Wars which they regard as being between a country and dependent territories, such as those in Angola, Mozambique, and Eritrea prior to formal independence, are classified by Singer and Small not as civil wars but as a sub-category of international wars termed 'extra-systemic'. However, since they are in many respects more akin to civil wars, being fought entirely within national boundaries, for our purposes we have included them in our sample.

While the series built by Singer and Small gives the potential for an analysis over a period of more than a century, and enables us to measure the period since the previous civil war without significant truncation, data on the other variables is only available for more recent periods. Data on *per capita* income and population size for the full sample is available from 1960 and for natural resources from 1965. Ethno-linguistic fractionalisation is measured as of the early 1960s. This yields a sample of 98 countries of which 27 had civil wars of varying durations during the period.

We use probit and tobit regressions to investigate whether the above variables explain the occurence and duration of civil war during the period 1960–92.

The results are presented in Table 1. The tobit utilises more information than the probit and so is the better form for assessing whether variables are significant. However, in order to interpret the effect of a variable it is more natural to focus not upon the duration of war but on the probablity of its occurrence.

All variables are significant in the tobit. In the probit, which uses less information, the index of ethno-linguistic fractionalisation loses significance but is still sufficiently close to significance for their coefficients to be useful in interpreting the effect of the variable on the risk of war.[1]

Higher *per capita* income reduces the duration of civil war and the probability of its occurrence. These effects are very powerful. At the mean of other variables the probability of civil war is 0.63 if the country has half mean income but only 0.15 if the country has double mean income. Similarly, the predicted duration of civil war is much shorter if income is higher. Civil war is overwhelmingly a phenomenon of low income countries.

The effect of natural resources is non-monotonic. The possession of natural resources initially increases the duration and the risk of civil war but then reduces it. The maximum occurred at 27% for the risk of war and at 24% for its duration. The average share for the 98 countries was 15% and the maximum was 67%. In

[1] In the probit ELF is only significant at 17% and the square of ELF is significant at 11%.

Table 1 Determinants of the occurrence and duration of civil war

		Probit of occurrence		Tobit of duration	
variable		coefficient	t-ratio	coefficient	t-ratio
income		−0.001	2.70	−0.069	2.39
primary		16.16	2.56	1957.6	2.49
primary^2		−29.47	2.28	−4106.0	2.42
ELF		0.0329	1.35	5.582	2.00
ELF^2		−0.0004	1.60	−0.065	2.02
population		0.0003	2.39	0.0086	2.31
sigma		–	–	135.45	6.49
		Predicted		log likelihood: −193.62	
		0	1		
Actual	0	65	6		
	1	13	14		

Notes: Income = PPP adjusted *per capita* income in 1960

primary = share of primary commodity exports to GDP in 1965

ELF = index of ethno-linguistic fractionalisation in 1960, ranges from 1–100

population = population in 1960 in 10,000

effect, possessing natural resources made things worse, unless there were plenty of them. The effect is again quite strong. At the means of other variables, a country with the worst amount of natural resources has a probability of war of 0.56 as against one without natural resources of only 0.12.

Both *per capita* income and natural resources proxy the taxable base, whereas *per capita* income also proxies the opportunity cost of rebellion. Thus, income could potentially predominantly proxy either variable. However, the effect of the taxable base should be non-monotonic, whereas that of the opportunity cost of rebellion should be monotonic. Were income predominantly proxying the taxable base, then it would enter as a quadratic, as do natural resources. In fact the square of income is not significant, so that the results are consistent with income being predominantly a proxy for the opportunity cost effect.

Countries with larger populations have higher risks of war and these wars last longer. We interpret this as the greater attraction of secession. A country with double mean population has an increased probability of war of 0.56 at the means of other variables, and an increased duration of war of 12 months compared with one with mean population. While potentially the effect of population size is ambiguous, since it also proxies coordination costs, evidently, the increased desire for secession predominates.

The effect of ethno-linguistic fractionalisation is also non-monotonic. We interpret this as proxying the costs of coordination. The probability of civil war reaches its peak when the index takes the value 38 (on the range 0–100) in the probit, and at value 43 in the tobit. At the peak value of 38 a country with otherwise mean

characteristics has a risk of war of 0.44. By contrast, both completely homogeneous societies (such as South Korea) and highly fractionalised ones (such as Indonesia with a value of 76) with otherwise mean characterisitics have a risk of only 0.30. Hence, it is not ethno-linguistic fractionalisation which is damaging to societies but that degree of fractionalisation which most facilitates rebel coordination.

Between them, these four variables make a substantial difference to the chances of civil war. Consider two societies, one ideally endowed in terms of the four variables and the other catastrophically endowed. The ideal society would have the maximum income found in our sample ($9,895), a natural resource resource endowment of 0.67, the maximum ethno-linguistic fractionalisation (93), and the smallest population (17.6). It would have a risk of civil war of 0.0000017. The catastrophic society would have the lowest income found in the sample ($257), a relatively high natural resource endowment (24%), a near-average degree of ethno-linguistic fractionalisation (38), and the largest population (43,485). It would have a risk of civil war of 0.99.

We have tested for robustness of the results by experimenting with several other variables, namely, population growth, population density, years since independence, and income inequality. None of these is significant in both the tobit and the probit and their inclusion leaves the core variables significant with largely unaltered coefficients.

Hence, the variables in the core regression were robust to changes in the specification.

In conclusion we apply the results to the specific problem of civil war in Africa. In 1960 Africa on average was characterised by conditions which made it prone to civil war. It was a very low income continent. It had a share of primary exports to GDP of 17%, higher than the world average but insufficient to reach the range in which natural resources purchase government security. The most favourable aspects of Africa's inheritance as of 1960 was that it had high coordination costs of civil war, both because of its very high ethno-linguistic fractionalisation (a mean of 67) and because societies were usually not polarised by recent previous wars: there had been only two civil wars in the previous decade. Thus, that Africa has had

Table 2 Africa compared with other developing countries

	sample	Sub-Saharan Africa	other developing countries
number of civil wars	27	12	15
average duration in months	112	111	113
income in 1960 in const. 1985 US$	2,378	845	1,880
primary	0.15	0.17	0.16
population in 10,000	1,854	595	2,412
ELF	42	65	36
N	98	32	40

many civil wars since 1960, is, on our analysis, due not to its ethno-linguistic factionalisation, but to its poverty.

4. Conclusion

We have investigated the generic causes of civil wars, building upon a simple theoretical framework based upon Hirshleifer (1987), Grossman (1995), and Azam (1995). The incentive for rebellion was increasing in the probability of victory, and in the gains conditional upon victory, and decreasing in the expected duration of warfare and the costs of rebel coordination. For any potential rebellion there is therefore a critical expected duration of warfare (which may be negative) at which rebellion becomes rational. Both the probability of civil war and its duration can therefore potentially be explained on a common set of variables.

We used data on the occurence and duration of civil wars 1960–92 for probit and tobit regressions. We have found that four variables are significant and strong determinants of both the duration and the probablity of civil wars. The higher is *per capita* income on an internationally comparable measure, the lower is the risk of civil war. We interpret this as being due to the effect of higher income on the opportunity cost of rebellion. The effect of natural resource endowments is non-monotonic. Initially, increased natural resources increase the risk of war. We interpret this as being due to the taxable base of the economy constituting an attraction for rebels wishing to capture the state. However, at a high level, natural resources start to reduce the risk of war. We interpret this as being due to the enhanced financial capacity of the government, and hence its ability to defend itself through military expenditure, gradually coming to dominate. The larger is the population the greater is the risk of war. We interpret this as being due to the increased attraction of secession.

We postulated that the extent of the coordination problem faced by potential rebels would influence the risk of war. We proxied coordination costs by ethno-linguistic fractionalisation, and by population size. Perhaps our most interesting result concerns ethno-linguistic fractionalisation, measured by an index on the range 0 to 100. Both economists and political scientists have postulated that such fractionalisation is unambiguously conflict-enhancing. Easterly and Levine (1997) have established that greater fractionalisation reduces growth, but have interpreted this as being due to the greater risk of conflict in fractionalised societies. Analogously, ethnic division is the most common political explanation for civil war. We have found that these interpretations are incorrect. While ethno-linguistic fractionalisation is significant, more fractionalised societies are not more prone to civil war. The relationship is a quadratic which peaks when the index is 38. The index would take the value of 100 when each individual was in a different ethno-linguistic group. It would take the value 38 when, for example, there were two similarly-sized ethno-linguistic groups. Highly fractionalised societies are no more prone to war than highly homogeneous ones. The danger of civil war arises when the society is polarised into two groups. The effect is again powerful. Polarised

societies have around a 50% higher probability of civil war than either homogeneous or highly fractionalised societies. Thus, a country with two similarly sized ethno-linguistic groups could reduce the risk of civil war either by partition or equally well by union with other countries. We interpreted the greater safety of highly fractionalised societies as being due to the high coordination costs of rebellion when the potential rebels are themselves fractionalised.

We investigated several other variables but found the above formulation to be robust. It is striking that between them these four make a very large difference to the risk of civil war. A hypothetical country endowed with the most favourable of each of these five characteristics found in our sample would have had a risk of war during the period 1960–92 of one in a million. A hypothetical country with the least favourable of each would have a risk of 99%.

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References

Azam, J.-P. (1995). 'How to pay for the Peace? A theoretical framework with references to African countries', *Public Choice*, **83**, 173–84.

Bennett, S.D. and Stam III, A.C. (1996). 'The Duration of Interstate Wars, 1816–1985', *American Political Science Review*, **90**, 239–57.

Easterly, W. and Levine, R. (1997). 'Africa's Growth Tragedy: Policies and Ethnic Divisions, *Quarterly Journal of Economics*, **112**, 1203–50.

Grossman, H.I. (1995) 'Insurrections', in K. Hartley and T. Sandler (eds), *Handbook of Defence Economics*, Vol. I, Elsevier Science B.V., Amsterdam.

Hirshleifer, J. (1987). 'Conflict and Settlement', in J. Eatwell, M. Milgate, and P. Newman (eds) *New Palgrave, A Dictionary of Economics*, Macmillan Press, London.

Mauro, P. (1995). 'Corruption and Growth', *The Quarterly Journal of Economics*, **110**, 681–712.

Sachs, J.D. and Warner, A. (1995). 'Economic Reform and the Process of Global Integration', *Brookings Papers on Economic Activity*, **Iss. 1**, 1–118.

Singer, J.D. and Small, M. (1994). *Correlates of War Project: International and Civil War Data, 1816–1992 (Computer file)*, Inter-University Consortium for Political and Social Research, Ann Arbor, MI.

Small, M. and Singer, J.D. (1982). *Resort to Arms: International and Civil War, 1816–1980*, Sage, Beverly Hills, CA.

Summers, R. and Heston A. (1991). 'The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–1988', *The Quarterly Journal of Economics*, **99**, 327–68.

Data Appendix

1. Sample

Sample includes the following countries:

Algeria*, Argentina, Australia, Austria, Barbados, Benin, Bolivia, Brazil, Burkina Faso, Burundi*, Cameroon, Canada, Central African Republic, Chad*, Chile, Congo, Costa Rica, Denmark, Dominican Republic*, Ecuador, Egypt, El Salvador*, Ethiopia*, Finland, France, Gabon, Gambia, Germany, Ghana, Greece, Guatemala*, Guyana, Haiti, Honduras, Hong Kong, Iceland, India*, Indonesia*, Iraq*, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Kenya, Korea, Liberia*, Madagascar, Malawi, Malaysia, Mali, Malta, Mauretania*, Mauritius, Mexico, Morocco*, Mozambique*, Myanmar*, Nepal, Netherlands, New Zealand, Nicaragua*, Niger, Nigeria*, Norway, Pakistan*, Panama, Papua New Guinea, Paraguay, Peru*, Philippines*, Saudi Arabia, Senegal, Sierra Leone, Singapore, Somalia*, South Africa, Spain, Sri Lanka*, Sudan*, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey*, UK, USA, Uganda*, Uruguay, Venezuela, Zaire*, Zambia, Zimbabwe*.

An asterisk indicates that the country experienced a civil war during 1960–92.

2. Variables

Income: real GDP for 1960 from Penn World Table Mark 5.6 (RGDPCH) (Summers and Heston, 1991).

Share of Primary Exports in GDP (Primary): share of primary exports in GDP in 1965 was obtained from the World Bank 'World Data' CD-ROM. The export of primary products (TX VAL RAWP CD) is the sum of the categories 'non fuels' covering SITC categories, 0, 1, 2, 4, and 68 and 'fuels' covering category 3. The data, as well as GDP (NYGDP MKTP CD), is measured in current US dollars.

Population: population data for 1960 was obtained from the World Bank 'World Data' CD-ROM (SP POP TOTL).

Ethnolinguistic Fractionalisation Index (ELF): Index as used by Mauro (1995). This variable measures the probability that any two citizens will be drawn from a different ethno-linguistic group. The variable is re-scaled so that complete homogeneity scores zero and maximum fragmentation scores 100.