WORKING PAPERS IN ECONOMICS

No 280

Why Are Market Economies Politically Stable? A Theory of Capitalist Cohesion

by

Carl-Johan Dalgaard
Ola Olsson

December, 2007

Why Are Market Economies Politically Stable?
A Theory of Capitalist Cohesion*

Carl-Johan Dalgaard[†]   Ola Olsson[‡]

University of Copenhagen   Göteborg University

October 31, 2007

Abstract

The present paper documents that political stability is positively associated with the extent of domestic trade. In explaining this regularity, we provide a model where political cohesion is linked to the emergence of a fully functioning market economy. Without market exchange, the welfare of inherently selfish individuals will be mutually independent. As a result, political negotiations, echoing the preferences of the citizens of society, will be dog-eat-dog in nature. Whoever has greater bargaining power will be willing to make decisions that enhance the productivity of his supporters at the expense of other groups in society. If the gains from specialization become sufficiently large, however, a market economy will emerge. From being essentially noncooperative under self-sufficiency, the political decision making process becomes cooperative in the market economy, as the welfare of individuals will be mutually interdependent due to the exchange of goods.

Key words: Political cohesion, Economic growth
JEL Classification codes: P16, O41

1 Introduction

It is well known that richer economies tend to be more politically stable than their less affluent counterparts. Indeed, almost every indicator of political turmoil, ranging from political protests against policies enacted by the current regime to the dramatic case of revolutions, exhibits a negative correlation with prosperity. This fact is often explained by *e.g.* the degree of fractionalization of society (measured in terms of income inequality, ethnicity, language or perhaps religious beliefs), and is suggested as one important reason for the dismal growth performance of Africa in particular (Easterly and Levine, 1997). However, a relative lack of political stability is not unique to modern day poor nations. Indeed, we argue below that a link between prosperity and political stability can also be found in the historical record of today's industrialized societies.

The present paper aims to provide a theory which is capable of shedding light on both the historical patterns and the observed cross-country correlation between political stability and prosperity, a regularity we will refer to as "capitalist cohesion". The fundamental hypothesis is that the nature of the political struggle between groups is critically affected by the organization of the economy. The organizational institution which is argued to be paramount is the market institution itself. That is, whether or not (the members of) rival political groups are engaged in trade with each other or not. The central idea is that market integration will tend be associated with a more cohesive political interaction between rival groups in society, reducing the incidence of political uheavals. The logic of the argument is as follows.

Consider a regime one may label "self-sufficiency". In this regime individuals are economically fully self-reliant in the sense that they produce the goods they consume themselves. This regime might be thought to approximate a predominantly subsistence-oriented economy. In the absence of markets where goods are exchanged the welfare of individuals will be mutually independent. As a result, any redistributive struggle between individuals will be fierce; whoever has greater bargaining power will be willing to make decisions that enhance the productivity of his supporters at the expense of other groups in society.

Consider instead the polar opposite case: A fully developed market econ-

omy. In the market environment rival political groups will be specialized in production of different goods and trading with one another. In a historical setting one may think of the political rivalry between merchants (and later manufacturers) on the one hand, and the landed elite (or farmers) on the other, as an example of how rival groups may be identified by the type of good produced.[1] The key insight is that it will no longer be unambigiously in the interest of any political group to make decisions that enhance their own productivity at the expense of other groups in society. The reason is that the market institution produces a price tag on curbing the living standards and productivity of selected groups; higher prices on the goods they are associated with the production of. As a result of market integration, an alignment of interests emerges and the political process becomes more cohesive because of it. Indeed, as demonstrated in the model below, the allocation outcome from political interaction in a market scenario becomes more efficient (in the stylized model, Pareto optimal), and unanimously agreed upon. Hence, insofar as a transition to a market economy occurs, political cohesion ensues, making political instabilty and conflict much less likely. In addition, output per capita rises due to the gains from specialization and because of more efficient political outcomes.

However, a transition from "self-sufficiency" to a market economy may not occur. As illustrated in the model below, whether a transition occurs or not depends, among other things, on the gains from specialization. If just one group stands to gain only little from trading, yet is politically powerful in "autarky", it may not wish to participate in the market due to its ability to appropriate resources through the political process. As a result a transition is not viable. Consequently, the process of *task-specific* skill formation, which drives comparative advantages in the model below, is key in fascilitating the emergence of political cohesion at a deeper level. If the scope for learning - within different tasks – is sufficiently large the gains from specialization will rise over time and sooner or later make a transition likely. Still, during the delay the economy as a whole is caught in what is effectively a poverty trap.

As should be clear, this theory is broadly consistent with the contempo-

---

[1]In contemporary Africa opposing political sides are often defined along ethnic lines. In some cases different ethnic groups are in fact distinguishable by which goods they tend to be associated with the production of. An example is presented in Easterly (2002, Ch. 13) involving the cocoa producing Ashanti's in Ghana.

rary cross-country correlation between income and political stability, provided that a lack of political cohesion is seen as the root of political instability. The theory suggests, moreover, that causality runs in either direction. On the one hand, economic progress enables a transition into a cohesive political climate. On the other hand, more political cohesion leads to more efficient political outcomes, which spurs productivity. Aside from being consistent with the correlations noted above, the theory also complements other hypotheses on the causes of political instability.

Consider the hypothesis that ethnic divisions are key in understanding political instability (e.g. Easterly and Levine, 1997; Annett, 2001). At the fundamental level the notion that ethnicity matters for political instability, and the present idea – that a lack of exchange in goods is the culprit – are perfectly reconcilable. For example, lack of (willingness to) trade could be grounded in ethnic hatred. Ethnically anchored political disagreements may therefore be perpetuated by a lack of economic interaction of individual groups. At the same time, the two "mechanisms" may be at work simultaneously, and independently of one another.

If political instability is a symptom of a lack of political cohesion, as we maintain, the theory contributes with a further understanding of why poorer economies tend to be more politically unstable, and why this state of affairs may come at a cost of lower living standards. From this perspective the present paper is related to the literature which directly examines the sources of political instability (e.g. Olson, 1963, Alesina et al, 1996; Easterly and Levine, 1997) or civil conflict (Collier and Hoeffler, 2004; Miguel et al., 2004; Olsson, 2007). Similarly related is a string of contributions which provides theory and evidence on the consequences of political instability for prosperity or institutional change (e.g. Rodrik, 1993; Acemoglu and Robinson, 2000; Bates et al, 2004; Barro, 1991; Alesina et al., 1996).[2]

The paper is also related to a (primarily political science) literature which explores the potential links between trade, democracy and interstate conflict. The idea that free trade and democracy are associated with

---

[2]A major implication of the present paper is that cohesion arises gradually during development. From this perspective the work of Galor et al (2005) and Galor and Moav (2006) are related. In these works, however, consensus is ultimately generated due to capital-skill complementarity which makes rival political groups interdependent (i.e. workers and capitalists). The present paper contains a different consensus creating mechanism; the market mechanism itself.

peace on the international arena has a long history and goes back to Immanuel Kant, Adam Smith, Richard Cobden, among others. In political science, a large contemporary literature has emerged that studies the phenomenon often referred to as "the liberal peace". That is, that democratic and market-oriented countries usually do not fight with each other.[3] How this relationship comes about is an issue that political scientists still gripple with. Mousseau (2003), for instance, proposes that countries where people are engaged in contractual exchange of goods and services gradually tend to develop liberal norms and values, which in turn strengthen the market economy. On the basis of a statistical analysis of interstate wars 1950-92, Gartzke (2007) even claims that the positive effect of democracy on peace disappears when a variable for financial openness is included. According to Gartzke (2007), we should therefore refer to the link between prosperity and political cohesion as "the capitalist peace". Our paper adds to this literature by modelling the process of how an internal market economy arises, which is arguably a necessary requisite for subsequent international trade.[4]

The paper is structured as follows: In section 2, we present historical and cross-country evidence on the relationship between political stability and market orientation. In section 3, we outline the production and consumption decisions of our two groups, whereas the political interaction between groups is modelled in section 4. In section 5, we derive the conditions for choosing one self-sufficiency or a market economy. Section 6 discusses the implications of the model and section 7 concludes.

2 Evidence

The central hypothesis of the paper is that stability is promoted by the exchange of goods rather than income per se. Since domestic trade is associated with productivity grains from the division of labor, one would expect a positive correlation between income and stability. In this section we examine historical evidence which suggest that increasing trade intensity ushered the beginning of a more politically stable environment in Europe in general,

---

[3]For a literature overview and some new evidence, see Mousseau et al (2003).

[4]Skaperdas and Syranopoulos (2001) provides a formal statement of this idea. In their analysis, trade between nations does not necessarily lead to peace. Furthermore, the price of the traded good is assumed to be exogenous, whereas endogenous terms of trade (between rival groups or regions) is a key part of our theory.

and in the UK in particular. In addition, we make an attempt to link domestic trade directly to political stability by way of cross-country regression analysis.

2.1 Historical evidence

Consider England, the epicenter of the industrial revolution. As pointed out by Clark (1996, p 568):*"Between 1560 and 1770, England experienced numerous periods of political turmoil, internal warfare, and important changes of political regime"*. Indeed, this period contains events such as the English Civil War (1639-51), several planned coups and the "glorious revolution" of 1688. In fact, most of mainland Europe was characterized by a similar state of affairs during this period. De Vries (1976, p. 3) puts it succinctly:

> " ... the seventeenth century is marked by an unusual number of civil disturbances: aristocratic protests against the growth of the bureaucratic state and peasant revolts against new taxes, changed land tenure conditions, and food distribution measures that offended a sense of economic justice".

When moving beyond the 17th century one continues to observe disruption on a fairly regular basis in England. 18th and early 19th century England witnessed the Gordon Riots of 1780, the Luddith movement, the 1776 American Revolution, food riots and a considerable assortment of minor uprisings (Archer, 2000). Eventually, however, England did enter a period of calmer political climate towards the end of the 19th century, and continued on the path towards prosperity (Olson, 1963). But clearly the historical record demonstrate that the political climate in England used to be turbulent, with periods of political upheavals not unlike what is observed in modern day less developed economies.

In the context of the historical record one may wonder whether a transition from "self-sufficiency" to "market trade" can be said to have bearing on what occurred in Europe in general, and England in particular, during the last millennium. To be sure, there is no historical period where "autarky" can be said to be an exact description of how the economy was organized. At least as far back as the Dark Ages archeological evidence of formal market places can be marshaled (Hodges, 1982, Ch. 9), and during the Medieval period historical evidence can be brought to bear on how markets in England

expanded and contracted as a function of the time varying size of population (Britnell, 1993). Still, there is no doubt the last millennium has seen a remarkable expansion of the role of the market in peoples everyday life. As Seabright (2004, p. 42) puts it:

> "*Until around six hundred years ago in Europe, and until a little more recently in North America, most families ate food they had grown themselves. They were certainly not self-sufficient in the strict sense since they relied on others for some things – metal for agricultural tools for example. But changes in their links with the outside world would rarely threaten their food supply. Today, in the same countries, most families who were prevented from exchanging with others would starve within a few weeks*".

From this perspective; if one thinks about the current organization of the economy, where individuals to an extreme extend rely on each other (or rather the market) for their survival, as a fully integrated market economy, the simplification of describing the situation in Europe a millennium ago as "autarky" may seem less unreasonable as a (perhaps crude) approximation.[5]

Turning to the crux of the historical theoretical argument; a reasonable case can be made that market participation and the exchange of goods did accelerate in the centuries preceding the industrial revolution, thus paving the way for a more cohesive political climate. The intensification of market participation, associated with a gradual reduction in the degree to which individuals were self-sufficient with regards to agricultural goods is what De Vries (1994) labels the "industrious revolution". In particular he remarks that (p. 257):

> "*.. the industrious revolution, for which evidence can be found from the mid-seventeenth century into the early nineteenth, consisted of two transformations: the reduction in leisure time ... and the allocation of labor from goods and services for direct consumption to marketed goods*".

---

[5]The notion of a clean "switch" from autarky to a full market economy is a similar (over)simplification. Historically, the expansion of trade over increasing distances was probably a gradual one (e.g. North, 1991). This gradual evolution covering periods of partial specialization in the economy is not captured by the model. Providing a more detailed description of the evolution of the market institution and its gradual effects on the nature of the political struggle is a topic for future research.

Moreover, as for the other half of society – the city dwellers – Voth (1998) provides evidence of a large increase in working hours between the eighteenth and nineteenth century for Londoners. With less time to spare the urban population would naturally have to become correspondingly more reliant on (increasingly specialized) food producers in order to sustain themselves.[6]

Seen through the lenses of the theory advanced in the present paper; once the "industrious revolution" is complete, resulting in an intensified exchange of goods, the political climate should start to become more cooperative in nature, as it arguably did in England starting sometime in the last half of the nineteenth century.

2.2 Cross-country evidence

2.2.1 Specification

In this section we attempt to gauge the importance of domestic market integration for the extent of political stability by way of cross section regression analysis. The central hypothesis we wish to examine is whether exchange of goods, rather than income per se, matters to stability. This implies that we cannot use GDP per capita as our measure of choice for domestic market integration; instead we will rely on other proxies.

Formally, we estimate an equation of the following form

$$S_i = \beta T_i + \mathbf{X}_i' \boldsymbol{\gamma} + \epsilon_i, \tag{1}$$

where S_i is a measure of political stability, T_i is a proxy for domestic trade intensity, $\mathbf{X}_i$ a vector of additional controls (which includes a constant term). Finally, ϵ_i captures noise and omitted variables. The parameter of central concern is β, which we estimate by ordinary least squares (OLS) and two stage least squares (2SLS).

2.2.2 Data

In measuring political stability (POLSTAB) we rely on the well known measure developed by Kaufmann et al. (2006); POLSTAB is an average for the period 1996-2005 and higher values of the index is associated with greater

---

[6]However, see Clark and Van der Werf (1998) for a sceptical assessment of the claim that working hours expanded during this period.

stability. Specifically, Kaufmann et al (2006, p 4) define it as capturing: "Perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism."

In proxying domestic trade intensity we chiefly rely on the ratio of nominal money supply to nominal GDP. The logic of using this variable, for this purpose, is as follows. By the quantity theory of money $M \cdot v = P \cdot T$, where M is the nominal money supply, v is the velocity of money, P is the price level and T the number of *transactions*. Accordingly, by the quantity theory we may therefore write nominal money to nominal GDP as

$$\frac{M}{PY} = \frac{(1/v) \cdot P \cdot T}{PY} = \frac{T/v}{Y},$$

which gives the ratio of the number of times a unit of currency is transacted (T/v) relative to real output. Hence, the more times a unit of output is transacted, by way of monetary exchange, the larger the ratio. We expect this be a sensible proxy for the intensity of domestic exchange of goods in monetary economies, and we refer to the variable as "transaction intensity" (TRANS). It is usually assumed that T and v are fixed in the short run and that they capture the structural behavior of consumers and firms. Nothing precludes however that T/v varies in the long run. We expect to be able to pick up this variation when comparing countries at different stages of development. As should be clear, we expect TRANS to be positively correlated with POLSTAB. The source of the variable is World Development Indicators (2005) (WDI), and it is measured in 1995.[7]

To stenghen the case for an association between domestic trade and political stability, we invoke two additional proxies: *external* trade intensity, and phonelines per 1000 inhabitants.

The use of external trade to proxy domestic trade is based on the idea that countries with more external trade also tend to have well developed domestic markets, featuring a high degree of exchange of goods (see Frankel and Romer, 1999, p. 380). Accordingly, the contention is that greater external trade signals greater domestic trade, and we therefore expect external trade to be positively correlated with POLSTAB. Trade is more specifically

---

[7]Technically, M is measured as M2, i.e. notes and coins in circulation plus highly liquid bank deposits.

measured as proposed by Alcalá and Ciccone (2004): REALTRADE. RE-
ALTRADE is given by total imports plus exports (measured in constant
dollars), divided by PPP GDP. It is measured in 1995, and we expect it
to be positively associated with POLSTAB. The data source is WDI. The
variable is measured in 1995, and derives from WDI.

We use the number of phonelines per 1000 inhabitants ("COMM") to
capture transaction costs. In particular, we would expect that in the ab-
sence of an adequte acess to communication tools it will be harder to match
sellers and buyers, which works to lower the intensity of domestic trade. Ac-
cordingly, we expect COMM to be positively correlated with POLSTAB.[8]

Table 1 provides a correlation matrix between TRANS, COMM, REAL-
TRADE and POLSTAB, and Table 2 reports summary statistics for selected
variables

TABLE 1 & 2

Reassuringly, the three proxies for domestic trade intensity are mutu-
ally highly correlated, as seen from Table 1. Moreover, as an indication of
things to come one may note the sizeable correlation (consistent with priors)
between all of the three measures and POLSTAB.

Finally, when investigating the robustness of the partial correlation be-
tween our proxies of choice for domestic market integration, we also include
a set of controls ($\mathbf{X}$) which have been argued to affect the extent of political
stability in the existing literature (Olson, 1963; Alesina and Perotti, 1996;
Easterly and Levine, 1997; Annett, 2001). This list consists of the following
controls: Ethnic fractionalisation, GDP per capita, the growth rate of in-
come per capita, ores and metal exports (i.e. natural resources), a socialist
dummy, the urbanisation rate, primary schooling, government consumption,
land inequality and, finally, the poverty head count ratio (1 $ per day).[9] In
addition, we include a full set of regional dummies. Some of these variables
are only available for a relatively small sample of countries, others are widely
available. In the OLS regressions the sample size therefore varies when we

---

[8]More generally, phonelines may proxy the extent of domestic infrastructure; roads,
airports, harbours, and so forth. All these types of infrastructure are likely to affect
domestic trade in similar ways.

[9]A brief description of each variable (and motivation for its inclusion) is found in the
appendix.

successively include the above mentioned controls one at the time; and when we include them all at once.

In the context of 2SLS regressions, however, we instrument T, and control only for the plausibly exogenous determinants from the above list. That is, ethnic fractionalisation and the regional dummies. This allows us to estimate the impact from an exogenous change in T on POLSTAB using a data set which includes more than 140 countries.

2.2.3 Results

Partial Correlations Table 3 shows the results from estimating equation (1) by ordinary least squares. The approach taken consists of including a proxy for domestic trade intensity along with ethnic fractionalization and a full set of regional dummies. In addition we provide the results from successively introducing likely covariates of POLSTAB into this baseline specification. Finally, we also report the results from including (nearly) all the determinants of POLSTAB at the same time. We provide detailed results for T =TRANS, whereas we only report the results from the "full specification", in the case where T =REAL TRADE and COMM. This is done in the interest of brevity. The detailed results are very similar, and available upon request.

TABLE 3

Turning to the results reported in column 1-9 it is clear that TRANS enters with the expected sign. In all cases it is significant, albeit only at 10% when the "socialist dummy" is introduced. This dummy takes on a value of 1, if the country was ruled by a socialist regime during the period 1950-95. At closer inspection the dummy and TRANS are highly and negatively correlated. A possible interpretation is that a socialist government tend to implement policies which are detrimental to market exchange.

In column 10 we include all of the controls simultaneously, *except* the two measures of land inequality: GINI and landholdings.[10] The reason why we omit the latter is that including them reduces our sample to a mere

---

[10]These two variables are included simultaneously in column 9. As argued by Erickson and Vollrath (200X), the GINI index only captures inequality of land ownership *among landowners.* The variable "landholdings" proxies the proportion of landless individuals. Together these two variables therefore gives a more adequate picture of land inequality.

18 observations leaving us with a serious lack of degrees of freedom. Still, the "damage" should be limited in that we do control for the poverty rate; given GDP per capita this should provide some control for the distribution of income.

In any case, the main point is that TRANS remains significant (at 10%) when we include the remaining 8 potential determinants of POLSTAB, and a full set of regional dummies. Note in particular that TRANS remains significant when controlling for GDP per capita (LOG Y) and its growth rate (GROWTH).We interpret this result as supporting the hypothesis that market integration has a positive effect on political stability above and beyond its (likely) indirect impact via prosperity.[11] The exact same holds true when T is proxied by REAL TRADE and COMM (columns 11 and 12). Both are robust (significant at 5 % in fact) to the inclusion of all the mentioned auxiliary determinants of POLSTAB.

Identification and 2SLS estimates In a recent contribution Olsson and Hansson (2007) purpose that larger countries may be suffering, on average, from low institutional quality. Briefly, the logic of the theoretical argument is that large countries have two things working against them. First, it is harder to communicate rules and regulations of a society across a larger region. This effect is labelled the "broadcasting effect" by Olsson and Hansson. Second, larger countries may on average be more heavily endowed with natural resources. Consequently the costs for the elite in enforcing property rights may be higher on the margin in large countries, since an enforcement of property rights limits the elite's own ability to appropriate resource rents. The authors go on to demonstrate a strong and robust negative association between various measures of institutional quality (the rule of law index in particular) and the size of a country.

By extension, in the present context we argue that low institutional quality – as it manifests itself in a poor enforcement of the rule of law – tends to limit domestic exchange of goods by elevating the costs of transacting.

---

[11]Recent work by Acemoglu et al (2007) document that income per se does not seem to instigate changes in the political regime (dictatorship to democracy, or vice versa). Instead, regime changes seem highly related to country specific fixed effects, which also correlate with income. Our analysis suggests that such fixed effects could be capturing the extent of domestic market integration.

The argument can be summarized as follows:

Country size → Rule of Law → Intensity of domestic trade → Political stability.

Figure 1 illustrates these links using data for 136 countries. As can be seen, larger countries seem to have lower scores for the rule of law index (in 1996), which in turn is associated with more modest trade intensity, and lower political stability.

>Figure 1<

On the basis of these considerations we invoke country size as an instrument for T; Table 4 reports the results from estimating equation (1) by 2SLS where log country size is used as an instrument for each of our three proxies for domestic trade.

>Table 4<

Column 1 shows the impact from TRANS on POLSTAB, and the first stage association between country size and TRANS. As is clear, we have strong identification (by the "rule of thumb" standard: Staiger and Stock, 1997) and TRANS is highly significant in explaining POLSTAB. Comparing the 2SLS estimate to the OLS results reveals that the point estimate of TRANS rises when instrumented. If there is a bidirectional link between TRANS and POLSTAB our 2SLS estimate is consistent with the effect running from TRANS to POLSTAB being relatively stronger than the effect running in the opposite direction. Another interpretation of the higher point estimate is that the OLS regressions suffer from misspecification bias. That is, in the OLS regressions we might have omitted variables that are positively correlated with TRANS, but in their own right works so as to decrease political stability.

The estimated impact from TRANS is substantial. To get a feel for the size of the impact, suppose we were to increase TRANS by one standard deviation. This would increase POLSTAB by roughly 1.1, or what amounts to 1.3 standard deviations of the index in the sample; roughly the difference in political stability between Namibia and Finland.[12]

---

[12]Generating a 1 standard deviation increase in TRANS "exogenously" requires a reduction in country size of about 8 percent.

Column 2 and 3 repeat the exercise, but where the alternative proxies for domestic trade are instrumented by log area. In both cases we continue to have a strong first stage association between area and T. It is well known that a country's size is correlated with its external trade intensity (e.g. Frankel and Romer, 1999). Hence, the strong first stage association between area and trade is perhaps not particularly surprising, and could be motivated by other means than the above mentioned size-institutions-trade link. Still, the first stage results are consistent with our proposed mechanism as well. The first stage involving COMM is also noteworthy; larger countries tend to suffer from a less well developed communication infrastructure. This could easily be a symptom of a weak institutional infrastructure, in keeping with the basic logic of the instrumentation strategy. From the second stage results it is clear that using either alternative measure of T lend support the overall hypothesis that lower domestic trade intensity instigates lower political stability.[13] In sum, we view the above findings as yielding strong support for the hypothesis that increasing domestic trade intensity works so as to increase political stability.

3   The Model

Consider a growing economy in the process of development. Time is discrete, $t = 0, 1, 2...$ Imagine that at time $t = 0$, the initial population is distributed randomly across some land area. Individuals live for two periods: youth and old age. Their preferences are defined over two different goods. The two goods will be labelled "a" and "m", respectively. To fix ideas one can think of them as "agricultural" goods, and "manufactured" goods. The popula-

---

[13] As a final check we proceed to test the exclusion restriction behind the 2SLS estimates. This seems warranted for two reasons. First, if country size matters for the institutional framework of the economy, it could conceivably matter to POLSTAB above and beyond its effect through our proxies for T. Second, POLSTAB could possibly matter to country size. This would be the case if politically unstable countries tend to break up. If this indeed is the case, our instrument is endogenous, which in turn would induce a correlation between the second stage residuals and country size thus invalidating the IV strategy. The latter effect, however, seems unlikely to be important in practise. The reason is that if politically unstable societies disintegrate (and has done so historically) we would expect a positive correlation between POLSTAB and country size; in the data the correlation is negative. Nevertheless, these concerns do merit a closer look at the exclusion restriction. In the Appendix.we include an additional instrument and proceed to test it. Data does not allow us to reject the exclusion restriction with respect to TRANS and COMP, while it is rejected for REAL TRADE.

tion can be divided into two distinct groups according to their comparative advantages in production of these goods. Henceforth "a-people" and "m-people". The origin of these differences are described below, but are related to the process of transmitting knowledge from one generation to the next and depends on geographical location. In every period, the groups interact with the purpose of dividing a scarce resource between them.

The overall sequence of events in the model is the following:

1. The two groups choose what regime they prefer to be in: Conflict under self-sufficiency (S_C), bargaining under self-sufficiency (S_B), or bargaining under market economy (M).

2. The groups divide up a common productive resource (R) between them through either open conflict or peaceful bargaining, depending on the political regime chosen in the first stage.

3. The two groups decide how much to produce and consume (and potentially trade), using the allocation of R determined in the second stage.

As usual, we assume rational and forward looking individuals who can perfectly assess the effects of choices in each stage. The model is solved through backward induction. We therefore start below by solving for the production and consumption decisions in the third stage.

3.1 Preferences

Each person lives for two periods; youth and adulthood. Individuals are only economically active in the second period. In period one individuals are being brought up, in the process of which they acquire human capital. In addition they share consumption with their parent. At any given point in time, there exist L_a adults living at "a-locations", while L_m adults inhabit "m-locations". Accordingly $L = L_a + L_m$. Assume that once individuals are settled in an area they remain immobile. More precisely, individuals in a-locations are assumed not to attempt to move to m-locations and vice-versa.[14] For simplicity, we will also assume that population levels remain constant throughout the analysis.

---

[14]Since location specific knowledge needs to be acquired when changing region, costs of moving could be prohibitively high. In addition there would be the standard costs

Individuals living at location $\lambda = a, m$ have the following utility function:[15]

$$U_\lambda = U(a_\lambda, m_\lambda) = a_\lambda^\alpha m_\lambda^\beta, \ \lambda = m, a \qquad (2)$$

which depends on consumption of the two goods where exponents $\alpha + \beta = 1$ indicates the relative utility of each good. The utility function satisfies the usual assumptions of a positive but diminishing marginal utility of each product. All individuals have x units of time at their disposal for productive activities during adulthood. In a regime where individuals are self-sufficient they will split their time between production of the two goods. Accordingly, individuals are subject to a time constraint

$$x = x_{m\lambda} + x_{a\lambda}, \qquad (3)$$

where $x_{i\lambda}$ represents time allocated to the production of good i at location λ.[16]

The total amount of available time for productive activities x depends in turn on the type of interaction that is employed to divide the common resource between the two locations:

$$x = \begin{cases} 1 & \text{in case of political bargaining} \\ \underline{x} < 1 & \text{in case of violent conflict} \end{cases}$$

We assume for simplicity that the total available time is unity whereas the time required for fighting is 1-$\underline{x}$. This assumption is made to ensure that conflict has a cost in terms of forgone production. The conflict option might be thought of as a "Hobbesian state of nature" where groups are constantly at war with each other.

3.2 Production

The production technologies are

$$m_\lambda = R_\lambda h_{m\lambda} x_{m\lambda}^{\gamma_\lambda} \qquad (4)$$

---

associated with transport etc. These costs would not necessarily be uniform across, say, a-people, since the physical distance to a m-region could vary from one person to the next. As a result, even if there were an incentive to move, the area need not be "emptied".

[15]From now time subscript will be suppressed in the interest of brevity.

[16]In a previous version, we also included the raising of children as a component of the time budget and of the utility function.

16

$$a_\lambda = R_\lambda h_{a\lambda} x_{a\lambda}^{\delta_\lambda}, \tag{5}$$

respectively.

R_λ is to be thought of as the amount of a resource that can be used in both tasks, at a given location. As will be discussed further below, $R_a + R_m = R$ where R is the fixed supply of the resource. Throughout history, land has probably been the most important factor of production and one which has also frequently been the object of distributive struggles. Minerals and fuels are other examples of contestable resources. More broadly, one might think of R as the productive resources that a government controls such as contracts, concessions, protection, infrastructure, or the like. Below the allocation of the resource between individuals at the two locations will be determined by way of peaceful bargaining or through open conflict. Therefore, R_λ associates the distributive struggle between groups with their individual living conditions, and therefore links the political struggle to aggregate productivity in a simple way.

The other factors of production are human capital (skills) h and time x. We assume that output increases linearly with skills whereas there is diminishing returns to working time since the output elasticities are $\gamma_\lambda, \delta_\lambda < 1$.

A key assumption is that people in the two regions or locations have a comparative advantage in producing one of the two goods. More specifically, we assume that

$$\gamma_m = \delta_a > \gamma_a = \delta_m \tag{6}$$

In other words, at m-locations, the marginal productivity of an additional working hour is larger in the m-activity than in the a-activity ($\gamma_m > \delta_m$), and conversely at a-locations ($\delta_a > \gamma_a$). For simplicity, we assume that there is a symmetry in these productivity differences.

In order to ensure the emergence of comparative advantages in production, we assume that output elasticities and the Cobb-Douglas utility parameters are defined by the following inequality:

$$\frac{\delta_a}{\gamma_a} > \frac{\beta}{\alpha} > \frac{\delta_m}{\gamma_m} \tag{7}$$

17

3.3 Human capital accumulation

Sector specific skills at the two locations $h_{i\lambda}$ accumulate through a process of learning-by-doing in accordance with:

$$h_{i\lambda t+1} = Ax_{i\lambda}h_{i\lambda t}^{\eta}, \text{ for } i = a, m; \ \lambda = a, m; \ h_{i0} \text{ given.} \tag{8}$$

The skills of the next generation specific to production of good i at location λ, depend on two factors: The knowledge of the parent, $h_{i\lambda}$, the general technological stage of development in society at large A, and the working time in that sector $x_{i\lambda}$. In this way, the intergenerational transmission of skills is a kind of positive externality from ordinary production. $\eta \in (0, 1)$ means that there is diminishing returns to the human capital of the old generation in the learning process.

The relative level of skills in producing the two goods, at location λ, is given by

$$\frac{h_{a\lambda t+1}}{h_{m\lambda t+1}} = \left(\frac{Ax_{a\lambda}}{Ax_{m\lambda}}\right)\left(\frac{h_{a\lambda t}}{h_{m\lambda t}}\right)^{\eta}. \tag{9}$$

In a steady-state where $h_{a\lambda t+1}/h_{m\lambda t+1} = h_{a\lambda t}/h_{m\lambda t} = \tilde{h}_{a\lambda}/\tilde{h}_{m\lambda}$, we will have that

$$\frac{\tilde{h}_{a\lambda}}{\tilde{h}_{m\lambda}} = \left(\frac{x_{a\lambda}^{*}}{x_{m\lambda}^{*}}\right)^{\frac{1}{1-\eta}}. \tag{10}$$

where $x_{i\lambda}^{*}$ is the equilibrium time allocation to the specific production activity, which will be determined next.

3.4 Optimization under self-sufficiency

As discussed above, there are two basic regimes for organizing production in the aggregate economy: Self-sufficiency in which people at both locations produce both goods in isolation from each other, and a market economy when trade between locations takes place and production is specialized.

Under self-sufficiency, the utility maximization problem is to find, for both regions $\lambda = a, m$,

$$x_{m\lambda}^{*} = \arg\max\left\{\left(R_{\lambda}h_{a\lambda}\left(x - x_{m\lambda}\right)^{\delta_{\lambda}}\right)^{\alpha}\left(R_{\lambda}h_{m\lambda}x_{m\lambda}^{\gamma_{\lambda}}\right)^{\beta}\right.$$

The straightforward solutions for the time allocation problem are

$$x_{a\lambda}^* = \left(\frac{\alpha\delta_\lambda}{\alpha\delta_\lambda + \beta\gamma_\lambda}\right)x, \ x_{m\lambda}^* = \left(\frac{\beta\gamma_\lambda}{\alpha\delta_\lambda + \beta\gamma_\lambda}\right)x, \ \text{for } \lambda = a, m$$

implying an indirect utility under self-sufficiency (with an index S) of

$$V_\lambda^S \equiv \Omega_\lambda h_{a\lambda}^\alpha h_{m\lambda}^\beta R_\lambda \ \text{for } \lambda = a, m. \tag{11}$$

where $\Omega_\lambda = (\alpha\delta_\lambda)^{\alpha\delta_\lambda} (\beta\gamma_\lambda)^{\beta\gamma_\lambda} \left(\frac{x}{\alpha\delta_\lambda + \beta\gamma_\lambda}\right)^{\alpha\delta_\lambda + \beta\gamma_\lambda}$. It should be noted that x will differ depending on whether the common resource R is divided up through appropriative conflict or through bargaining, as shown above.

The equilibrium levels of time allocation can now be used in order to solve for the steady-state level of relative skills during self-sufficiency:

$$\frac{\tilde{h}_{a\lambda}}{\tilde{h}_{m\lambda}} = \left(\frac{\alpha\delta_\lambda}{\beta\gamma_\lambda}\right)^{\frac{1}{1-\eta}} \tag{12}$$

From (7), we can infer that $\tilde{h}_{aa}/\tilde{h}_{ma} > 1 > \tilde{h}_{am}/\tilde{h}_{mm}$, i.e. at the a-location, the steady-state level of skills in the production of a-goods will be higher than skills in producing m-goods, whereas the reverse will be true at m-locations. If we further compare human capital levels within the same activity across locations at some point in time, we can e.g. calculate the state-state level for $\tilde{h}_{aa}/\tilde{h}_{am}$:

$$\frac{\tilde{h}_{aa}}{\tilde{h}_{am}} = \left(\frac{\delta_a}{\delta_m} \frac{(\alpha\delta_m + \beta\gamma_m)}{(\alpha\delta_a + \beta\gamma_a)}\right)^{\frac{1}{1-\eta}} > 1 \tag{13}$$

Analogously, it is easily shown that $\tilde{h}_{mm}/\tilde{h}_{ma} > 1$.[17] Thus it is intuitively clear that the potential benefits of specialization and trade between locations will grow as a non-trading economy approaches its steady-state level of human capital.

---

[17]A short proof of the result in (13): $\tilde{h}_{aa}/\tilde{h}_{am} > 1$ if $\delta_a (\alpha\delta_m + \beta\delta_a) > \delta_m (\alpha\delta_a + \beta\delta_m)$, where we exploit the fact that $\gamma_m = \delta_a$ and that $\gamma_a = \delta_m$. After rearranging and cancelling terms, this inequality is only valid if $\delta_a > \delta_m$ holds, which we indeed know is true by definition from (6).

3.5 Optimization in a market economy

In this section attention will be restricted to the regime where trade takes place, and where people specialize in production in accordance with their comparative advantages. That is, as a result of the different paths of skill formation described in the section above, individuals at m locations might eventually find it beneficial to specialize in the production of m goods, while individuals at a-sites specialize in production of a goods.

While preferences of individuals are the same as under self-sufficiency, the budget constraints are different. For individuals at location $\lambda = m$, total income, y_m, is divided between consumption of m- and a-goods:

$$y_m = m_m + pa_m, \tag{14}$$

where p is the price of agricultural goods measured in terms of manufactured goods. Income of m-people derive from spending the entire time endowment on production of m-goods so that $x_{mm} = 1$.[18] This means that total income is

$$y_m = m = h_{mm}R_m. \tag{15}$$

For people living in $a-$locations the corresponding constraints are

$$y_a = m_a + pa_a$$

$$y_a = pa = ph_{aa}R_a.$$

Solving the utility maximization problem of individuals at the two locations leads to the following demand equations for the two products:

$$m_\lambda = \frac{\beta y_\lambda}{\alpha + \beta}, \ \ a_\lambda = \frac{\alpha y_\lambda}{p\,(\alpha + \beta)}, \ \text{for } \lambda = a, m. \tag{16}$$

In a competitive equilibrium relative supply equals relative demand, and the price adjusts so as to clear markets:

$$\frac{h_{mm}R_mL_m}{h_{aa}R_aL_a} = \frac{\frac{\beta}{\alpha+\beta}\left[y_mL_m + y_aL_a\right]}{\frac{1}{p}\frac{\alpha}{\alpha+\beta}\left[y_mL_m + y_aL_a\right]}$$

---

[18]Recall that violent conflict is not an option in this regime since we regard it as too unlikely that people in the two regions would first go to war over R and then trade peacefully with each other.

where $y_a L_a$ is total income of individuals of the a-type, $y_m L_m$ the income of the m-people taken together.

After some rearrangements we get the equilibrium price

$$p^* = \frac{\alpha}{\beta} \frac{h_{mm} R_m L_m}{h_{aa} R_a L_a}. \tag{17}$$

The relative level of skills under specialization is $h_{mm}/h_{aa} = 1$ since individual (a, m) spend her entire time endowment on the production of a-goods and m-goods, respectively. This ensures that the equilibrium relative price will remain constant over time. It also shows that the price for agricultural goods produced by a-type people will increase with R_m since a higher R_m means a corresponding lower level of R_a (since $R_m = R - R_a$) which decreases the production of agricultural goods and increases the price.

Using (16) and (17), we can solve for the indirect levels of utility in the market economy:

$$V_a^M = \alpha \left(h_{aa} R_a \right)^\alpha \left(h_{mm} R_m \right)^\beta \left(\frac{L_m}{L_a} \right)^\beta \tag{18}$$

$$V_m^M = \beta \left(h_{aa} R_a \right)^\alpha \left(h_{mm} R_m \right)^\beta \left(\frac{L_m}{L_a} \right)^{-\alpha}. \tag{19}$$

From these expressions, it is immediately clear that the utility of people in region λ will be directly dependent on the human capital and resource levels of their own region as well as on the corresponding levels of the other region. This is the primary vehicle behind the emergence of a more cooperative political process, as described below.

4   Political decisions

As mentioned above, the political "struggle" takes place in the second stage over the allocation of the resource $R = R_a + R_m$. We assume that there are three potential regimes for this political struggle: (i) An appropriative conflict under self-sufficiency, (ii) peaceful bargaining under self-sufficiency, and (iii) peaceful bargaining under market exchange.

4.1 Division of the resource under self-sufficiency

In the appropriative conflict scenario, the two groups first fight over the common resource and then produce in isolation without trading, using the time endowment $\underline{x} < 1$ that is left after the battle. We assume that the conflict payoff depends on the amount of the resource R that is contestable. Let us imagine that the two groups have non-contestable shares of the total resource, $\rho_a R$ and $\rho_m R$, that the other group can never conquer whereas the remaining part, $(1 - \rho_a - \rho_m)R$, is up for grabs. With probability q, group a wins the conflict (and group m lose) which leaves a-people with a resource endowment of $(1 - \rho_m) R$ (and m-people with an endowment of $\rho_m R$). In the event of losing the conflict, which occurs with a probability $(1 - q)$, group a only keeps their non-contestable part $\rho_a R$ and have to concede $(1 - \rho_a) R$ to group m. This means that the expected levels of R_λ in the conflict scenario are

$$
\begin{aligned}
E(R_a) &= (\rho_a + q(1 - \rho_a - \rho_m)) R = \theta R \\
E(R_m) &= (\rho_m + (1 - q)(1 - \rho_a - \rho_m)) R = (1 - \theta) R
\end{aligned}
\tag{20}
$$

where $\theta = \theta(\rho_a, \rho_m, q)$. When the conflict has been resolved, the two groups produce in isolation using the remaining time endowment $\underline{x}$.[19]

The other process for dividing up the resource, which might be employed during both self-sufficiency and market economy, is peaceful bargaining. We assume for simplicity that this scenario can be described by the following asymmetrical Nash bargaining problem:

$$
\max_{R_a, R_m} N^z = (V_a^z)^\pi (V_m^z)^{1-\pi}, \ z = S, M
\tag{21}
$$

In this expression, V_λ^z represents the indirect utility levels in regime $z = S, M$ for type $\lambda = a, m$ that were derived above and where π is the (exogenous) relative bargaining power of the a-group.[20]

In general, this formalization should be regarded as a metaphor for some-

---

[19] The division of R during conflict could have been modelled by using a contest success function in the spirit of Grossman and Kim (1995) such that 1-$\underline{x}$ was endogenously determined and that the probability of conquest q depended on this level. See Olsson (2007) for a model of this type.

[20] We recognize that θ and π are probably interdependent. One might even suspect that $\pi(\theta)$ where $\pi'(\theta) > 0$. Taking this into account does not affect the results of the analysis below to any appreciable extent.

thing more general. The objective of any political player is (at least in part) to obtain gains for his or her supporters. Sometimes political decisions represent Pareto improvements, but just as often it holds that "one group's gain is another's loss". While gains and losses in general are not necessarily symmetrical, the simple formalization of a Nash bargain over a scarce resource captures the flavor of non-violent political struggle, the outcome of which affects the income and productivity of the citizens of society.

The two opposing political "parties" will be (representatives from) the two different groups living in society: a-types and m-types. In a regime characterized by the absence of trade between groups we may think about political groups being organized around locations. In a fully developed market economy, location will also say something about occupation, due to the process of skill formation and derived comparative advantages in production, which is specific to individual locations. But the fundamental division of the population into distinct political groups can be regarded as the same across regimes, just as the decision making process itself.

The solution to the maximization problem above leads to the following proposition:

Proposition 1: *The bargaining solution under self-sufficiency is $R_a^* = \pi R$, $R_m^* = (1 - \pi) R$.*

Proof: The bargaining problem under self-sufficiency is to find

$$R_m^* = \arg \max N^S = \left[\Omega_a h_{aa}^\alpha h_{ma}^\beta \left(R - R_m \right) \right]^\pi \left[\Omega_m h_{am}^\alpha h_{mm}^\beta R_m \right]^{1-\pi}$$

where the terms inside the brackets (when multiplied by the bunch of parameters Ω) are the indirect utilities derived above. The usual steps leads to the solution stated above.

Hence, the division of the resource will simply reflect the relative political power of the two groups. In the event one group were to become "all powerful", nothing rules out a solution where it takes most of the resource for itself, leaving the other group to starvation. Hence, in this sense the political struggle is non-cooperative, just like in the conflict scenario above, as the two individual fractions of society simply attempt to grab as large a fraction of the resource as possible for their own benefit.

4.2 Division of the resource in the market economy

After substituting for the indirect utility levels of the two groups from (18) and (19) into the Nash bargaining function, it follows that the bargaining problem in a market economy becomes that of finding

$$R_m = \arg\max N^M = \Psi \left(R - R_m \right)^\alpha R_m^\beta$$

where $\Psi \equiv \alpha^\pi \beta^{1-\pi} h_{aa}^\alpha h_{mm}^\beta \left(\frac{L_m}{L_a} \right)^{\pi-\alpha}$.

In the same manner as above, we obtain the following key result:

Proposition 2: *The bargaining solution in the market economy is* $R_a^* = \alpha R$, $R_m^* = \beta R$.

Proof: Straightforward differentiation of the Nash product above yields the results.

Hence, in the market regime the division of power ceases to be relevant for the solution to the bargaining problem. In effect, the result is equivalent to choosing an allocation for R which maximizes the sum of the utility for the two groups. In other words, the outcome from the bargaining process will be unanimously agreed upon and Pareto optimal. The intuition for this result is simple. The productivity of the two types become linked, via the market mechanism. Seen from the perspective of, say, the a-type, the productivity of the m type becomes important, since this determines the price a individuals have to pay for manufactured goods. Likewise, individuals at $m-$sites will worry about the price of agricultural goods, and therefore, the productivity of a-types. This state of affairs leads to the cooperative outcome of the political process - i.e. capitalist cohesion - in the market regime.

5 Choice of regime

In this section, we reach finally the first stage of the model: The decision what regime to be in. In this decision, the agents take into account all the results derived in the previous sections.

The direction of regime changes that we consider to be most relevant

throughout history is:

Conflict under self-sufficiency $\rightarrow$ Bargaining under self-sufficiency $\rightarrow$

$\rightarrow$ Bargaining in market economy

We argue that conflict under self-sufficiency is a relevant initial condition in our model, although we recognize that there are several examples in history of how economies have reversed from a market orientation (or "proto-industrialization") even towards conflict under self-sufficiency.[21]

For a transition to occur in the direction described above, *both* of our groups need to be willing to switch.[22] If one group negates, a shift will not be realized and the economy will be stuck in a regime where individuals rely on self-sufficiency. Since people are homogenous within groups, there is no point in pursuing peaceful bargaining or trading unless both groups participate.

Starting with the transition from conflict to peaceful bargaining under self-sufficiency, a comparison of indirect utilities for individuals of type a can be made in the following manner:

$$\frac{V_a^{S_B}}{V_a^{S_C}} = \left(\frac{1}{\underline{x}}\right)^{\alpha\delta_a+\beta\gamma_a} \cdot \frac{\pi}{\theta} \tag{22}$$

In this expression, $V_a^{S_B}$ is the indirect utility from bargaining and $V_a^{S_C}$ is the indirect conflict utility. The ratio in (22) must exceed unity for a transition to occur. The differences between these two regimes without trade have two sources. Firstly, there is the obvious effect that under bargaining, agents do not need to devote a fraction $1-\underline{x}$ of their time to fighting so that the full amount of time $(x = 1)$ can be used in production. The size of this effect is $(1/\underline{x})^{\alpha\delta_a+\beta\gamma_a} > 1$.

The second effect, appearing on the RHS of (22), comes from a comparison of how big a fraction of the common resource R that a-people would lay their hands on under bargaining or conflict. We refer to this as the "relative bargaining power-ratio". The bargaining share is simply π whereas

---

[21] One such extended era of reversal was the period after roughly 400 AD when European long distance trade declined following the fall of the Roman empire. A more developed European market economy would not emerge again until around 1100.

[22] Reversals, on the other hand, only requires that one group wants to leave the current regime.

the conflict share is $\theta = (\rho_a + q(1 - \rho_m - \rho_a))$. Clearly, it will be the case that a-people will be more inclined to choose bargaining if their bargaining power π is high, if their non-contestable share of the resource ρ_a is low, if ρ_m is high, and if their fighting strength q is low.[23]

The level of relative indirect utility is calculated in an analogous manner for region m. It is noteworthy that it will always be the case that either one of the groups will have a relative bargaining power-ratio that is higher than unity and that the other one will have a ratio lower than unity. In other words, one of the two regions will always get a smaller allocation of R by bargaining. Whether the group that is relatively good at fighting will still be willing to go for bargaining depends on the levels of the first effect, in particular on the level of $1/\underline{x}$. The lower the level of $\underline{x}$ and the higher the output elasticities $\delta_\lambda + \gamma_\lambda$, the more costly will the conflict option be in terms of forgone production, and the more likely it is that even the militarily powerful group will want to switch to bargaining. There is however no dynamics involved here, which means that exogenous parameter changes might push the economy towards either conflict or bargaining where it will remain until new exogenous changes occur.

In periods of peaceful bargaining under self-sufficiency, agents in the two regions consider the option of starting to trade with each other.[24] However, a transition to a market economy is inevitably associated with transaction costs. Goods need to be physically moved to the market place, a monetary system of exchange might be necessary, and common standards need to be agreed upon, to mention a few examples (North, 1991). The transaction costs for setting up a common market also depends on geography, as emphasized by Gallup et al (1998). In a broader interpretation, one may think of the transaction costs as also depending on how secure private property rights are. If theft and expropriation of revenue is widespread this would add to the transaction costs as some kind of protection against such occurrences would need to be bought by the market participant.[25] To capture

---

[23] There is also a third effect that human capital accumulation will be lower under conflict, but this effect comes about with a one-period lag and does not affect the instantaneous utility comparison above.

[24] We consider it highly unlikely that regions in open conflict with each other should ever consider the option of starting to trade, although such a utility comparison could certainly be made.

[25] Grossman and Kim (1995) model such "defensive" and "offensive" expenditures explicitly. Offensive expenditures relate to costs associated with expropriating funds from

26

costs such as these in a simple way it is assumed that households need to pay a fixed cost, $C > 1$, in the event they start trading.

The utility comparison that people in the a-region make is

$$\frac{V_a^M}{V_a^{S_B}} = \Lambda \cdot \frac{\alpha}{\pi} \left(\frac{h_{mm}}{h_{ma}} \right)^\beta \left(\frac{L_m}{L_a} \right)^\beta \qquad (23)$$

where $\Lambda = \alpha^\alpha \beta^\beta \left(1 + \frac{\beta\gamma_a}{\alpha\delta_a} \right)^{\alpha\delta_a} \left(1 + \frac{\alpha\delta_a}{\beta\gamma_a} \right)^{\beta\gamma_a} > 0$, whereas the equivalent calculation of the net gain of entering a market economy for region m is

$$\frac{V_m^M}{V_m^{S_B}} = \Lambda \cdot \frac{\beta}{(1-\pi)} \left(\frac{h_{aa}}{h_{am}} \right)^\alpha \left(\frac{L_a}{L_m} \right)^\alpha. \qquad (24)$$

Finally, in the presence of transaction costs C, we require that the following inequalities are fulfilled if a transition to a market economy is to occur

$$a: \frac{V_a^M}{V_a^{S_B}} > C; \quad m: \frac{V_m^M}{V_m^{S_B}} > C. \qquad (25)$$

The interpretation of these conditions is straightforward. Consider for instance the m-type. First, a transition becomes more likely if $\frac{h_{aa}}{h_{am}}$ is large. This ratio reflects the gains from specialization in that it relates the productivity of an m-type in producing a goods (h_{am}), to the productivity of the type that owns a comparative advantage in producing a goods (h_{aa}). As knowledge of how to best produce a goods grows more rapidly at a-locations than at m-locations, we showed above that $\frac{h_{aa}}{h_{am}}$ will rise over time towards a steady-state level. Given that this level is large enough, the growing ratio will eventually persuade m-people to participate in the market.

Second, consider the term involving L_a/L_m. In the present model the ratio L_a/L_m is constant and dictated by the initial distribution of the population, since population levels are fixed. Nevertheless, the individuals in group m will find the market economy more attractive if L_a is large relative to L_m. This is a supply effect. More "a people" means a greater supply of the a good (relative to the m good), thus implying a lower relative price of the good that the m-type is purchasing in the market economy.

Third, the ratio $\beta/(1-\pi)$ represents a political effect. In autarky, type a

---

other individuals. They show that under certain circumstances individuals will refrain from investing in "offensive" measures, thus motivating scenarios where property rights are secure.

individuals' bargaining power is π. So the gains from shifting into the market economy are higher the more powerful the *other* group is. Furthermore, we may observe that the likelihood of a transition to a market economy increases when π approaches $1/2$, i.e. when initial political power is relatively equally distributed. Should π approach 0 or 1, one of the groups will always object to the transition and it will thus not occur.[26]

Finally, higher transaction costs C makes it less likely that any individual will engage in trade.

The condition for the individuals of group a can be interpreted in a similar manner. As goes for m-individuals, it is likely that individuals in the a group will eventually support a transition to a market economy, and start participating in trade, since h_{mm} grows faster than h_{ma}. However, a requirement for this to happen is that the steady-state levels $\tilde{h}_{mm}/\tilde{h}_{ma}$ and $\tilde{h}_{aa}/\tilde{h}_{am}$ are high enough.[27]

6 Discussion

Under the model the following evolution of an economy can be envisioned. Initially, the population is randomly distributed across a geographical area, after which an era of self-sufficiency commences. During this time the outcome from political interaction between geographically divided groups in society will be non-cooperative in nature, as groups try to grab as large a proportion of the resources that they possibly can through either conflict or bargaining, to the limits of their political power and influence. Slowly, however, due to task-specific learning, the gains from specialization rises. Eventually these gains are sufficiently large so as to entice even a very powerful group to commence trade with their political opponents. As a result, economic interdependence between groups arises via the price mechanism. This change transforms the nature of the political struggle, since it is no longer in the interest of a previously powerful group to provide its opponents with less than their "due share" of the economy's resource. Lower productivity of

---

[26] See Acemoglu and Robinson (2006) for a related discussion of how income inequality, manifested in political inequality, affects the likelihood of a transition to democracy.

[27] Formally, for m-types, we can deduce from (13), (24), and (25) that a transition to a market economy will only evolve endogenously if $\frac{\tilde{h}_{aa}}{\tilde{h}_{am}} = \left(\frac{\delta_a}{\delta_m} \frac{(\alpha\delta_m+\beta\gamma_m)}{(\alpha\delta_a+\beta\gamma_a)} \right)^{\frac{1}{1-\eta}} > \frac{L_m}{L_a} \left(\frac{C(1-\pi)}{\Lambda\beta} \right)$. If this condition is not met, perhaps because the gains from specialization are not sufficiently large, the economy will be stuck in a non-trading regime.

one group leads to higher prices of goods both groups consume. As a result, the optimal choice for both political groups will be to reach a compromise, the Pareto optimal allocation of the resource, which maximizes aggregate output. Moreover, this allocation is unanimously agreed upon; a sense of political cohesion has emerged. Hence, in the market regime, the outcome from the political process becomes cooperative to behold, and moreover, prosperity increases.

A transition to a market economy is only inevitable if the gains from specialization increases to a sufficient extent. Even in this case, however, the timing of a transition will be affected by structural charactaristics of individual economies like transaction costs and the political division of power. But once the economy has transited into a market regime, the political outcome is Pareto optimal. Consequently output rises due to this fact alone, but also because the market allows individuals to exploit comparative advantages. Hence there is a bi-directional link between affluence and political cohesion.

At the same time it is worth stressing that, in the present theory, it is possible to violate the association between *income* and cohesion, if different countries are compared at a given point in time. To illustrate; consider two different economies, where one is richer than the other. This difference in productive capabilities may not necessarily be trade induced. Indeed, one economy could be relatively richer because of a larger supply of natural resources (R). Since the "market transition" depends on the size of *relative* levels of productivity across individuals, not absolute levels of the same, the rich economy could be in a "no-trade" regime, while the poorer economy of the two could be organized as a market economy with full specialization. While this example perhaps is too contrived to be regarded as the "likely" configuration of prosperity and tranquility it serves to highlight an important point: Merely raising the income of an economy (say by infusing foreign aid) will not lead to a more cohesive political climate unless this increase of productivity is associated with a intensified exchange of goods between citizens of society. This is consistent with the evidence presented in section 2.2.

Could there be a reversal from a capitalist market economy back to sulf-sufficiency in our model, perhaps due to an exogenous shock? Since trading requires a consent by both regions, a reversal to self-sufficiency happens if

one of the regions opts out of the market economy. This is not a likely scenario since specialization in our model will drive h_{ma} and h_{am} to zero so that people forget how to produce anything else than the good they have specialized in. In this sense, people in the capitalist economy will have "burned their bridges" back to a non-specialized structure of production.

In reality, of course, the sector without a comparative advantage usually does not disintegrate completely in a market economy. Suppose that for some reason $h_{am}, h_{ma} > 0$ so that it is not completely impossible to return to self-sufficiency. The expressions in (24) and (23) then suggest some shocks that possibly could cause a collapse of the market economy. If, for instance, the population ratio L_a/L_m fell - perhaps due to disease, mass starvation, or emigration from the a-region - the price of a-goods would rise due to the fall in supply. From (24), we see that if this change was large enough, then m-people might be induced to switch back to self-sufficiency.

Finally, it is worth stressing that we do not claim that conflicts never happen in capitalist societies. In the terminology of Collier and Hoeffler (2004), conflicts may arise due to "greed" as well as being a consequence of "grievances" between groups. The latter motive may be highly persistent, reflecting perhaps religious and ethno-linguistic differences. There is no reason to expect that market integration would remove the risk of conflict if primarily caused by such societal divides. Indeed, fractionalization could inhibit the development of markets, as noted in the introduction. We do expect, however, that conflicts spawned by the greed motive should become less pervasive once extensive trading relations between citizens have been established.

7 Concluding Remarks

The present paper has developed the hypothesis that economic interaction between agents, the exchange of goods, is crucial for the nature of political outcomes. In particular it describes a possible trajectory along which an economy may travel in the course of development which eventually takes it into a regime where political cohesion prevail. The implied link between income and political cohesion is broadly consistent with both modern day evidence on affluence and stability, as well as the historical record of current day developed economies.

The model is needles to say highly stylized. For example, it only allows for two rival political groups. In principle the framework could be generalized to the case of N groups (politically engaged in generalized Nash bargaining) with individually specific comparative advantages. Potentially this would allow for regimes involving partial specialization (some groups are trading, others are not), thus capturing a more gradual process of market integration. At the same time the model would become complex to the point of being intractable, given the large set of viable economic equilibrium outcomes in a "world" involving trade in N goods.

The basic idea forwarded in the present paper could be applied to other areas of interest. A line of inquiry where the logic of the model might apply is the sustainability of democracy. One might conjecture that in order for democracy to persist certain amounts of political cohesion between rival political parties is required. In the absence of a fully developed market economy, democratic institutions may allow a majority to treat a minority "unfairly", leading the latter to nurse a grievance. Conversely, if political fractions are economically integrated, political cohesion arises, leading to policy choices with broad public support, thus making democratic institutions relatively uncontroversial from the perspective of individual citizens of society. While economic integration allows for higher income per capita, as gains from specialization are exploited, the key driving force behind cohesion is the interdependence of individuals via the market. Income does not matter per se, in contrast to the so-called "modernization hypothesis" (Lipset, 1959). Perhaps it was not a coincidence that democratic institutions spread across Western Europe following the industrious revolution?

References

[1] Acemoglu, D., S Johnson, J.A. Robinson, and P. Yared, 2007. Reevaluating the Modernization Hypothesis, mimeo MIT.

[2] Acemoglu D. and J. Robinson, 2006. Economic Origins of Dictatorships and Democracy. MIT Press: Cambridge, Massachusetts.

[3] Acemoglu D. and J. Robinson, 2000. Why did the West Extend the Franchise? Quarterly Journal of Economics, 115, 1167-99.

[4] Alesina, A. and R. Perotti, 1996. Income distribution, political instability, and investment. European Economic Review, 40, p. 1203-1228

[5] Alesina, A., S. Özler, N. Roubini and P. Swagel, 1996. Political Instability and Economic Growth. Journal of Economic Growth, 1, p. 189-211.

[6] Annett, A., 2001. Social Fractionalization, Political Instability and the size of Government. IMF Staff Papers, 48, 561-92

[7] Archer, J.E, 2000. Social Unrest and Popular Protest in England 1780-1840. Cambridge University Press

[8] Barro, R.J, 1991. Economic Growth in a Cross-Section of Countries. Quarterly Journal of Economics, 106, 327-69

[9] Britnell, R.H., 1993. The Commercialisation of English Society 1000-1500. Cambridge University Press

[10] Clark, G., 1996. The Political Foundations of Modern Economic Growth: England 1540-1800. Journal of Interdisciplinary History, 26, p. 563-88.

[11] Clark, G. and Y. Van der Werf, 1998. Work in Progress? The Industrious Revolution. Journal of Economic History, 58, 830-43.

[12] Collier, P. and A. Hoeffler, 2004. Greed and Grievance in Civil War. Oxford Economic Papers, 56, 563-95.

[13] De Vries, J., 1976. The Economy of Europe in the Age of Crisis, 1600-1750. Cambridge University Press

[14] De Vries, J., 1994. The Industrial Revolution and the Industrious Revolution. Journal of Economic History, 54, p. 249-70.

[15] Diamond, J., 2005. Collapse – How Societies Choose to Fail or Succeed. Viking Penguin, New York

[16] Easterly, W., 1999. Life During Growth. Journal of Economic Growth, 4, 239-76.

[17] Easterly, W., 2001. Can Institutions Resolve Ethnic Conflict? Economic Development and Cultural Change, 49, 687-706.

[18] Easterly, W., 2002. The Elusive Quest for Growth – Economists' Adventures and Misadventures in the Tropics. MIT Press, London.

[19] Easterly, W. and R. Levine, 1997. Africa's Growth Tragedy: Politics and Ethnic Division. Quarterly Journal of Economics, 112, 1203-50.

[20] Erickson, L. and D. Vollrath, 2007. Land Distribution and Financial System Development. IMF working paper 07/83.

[21] Galor, O and O. Moav, 2006. Das Human Kapital: A Theory of the Demise of the Class Structure. Review of Economic Studies 73(1), 85-117.

[22] Galor O., O. Moav and D. Vollrath, 2005. Land Inequality and the Emergence of Human Capital Promoting Institutions. Working Paper (Brown University)

[23] Gallup, J.L., J. Sachs, A. Mellinger (1998) "Geography and Economic Development", NBER Working Paper 6849, NBER.

[24] Gartzke, E. 2007. The Capitalist Peace. American Journal of Political Science 51(1): 166-191.

[25] Grossman H. and M. Kim, 1995. Swords or Plowshares? A Theory of the Security of Claims to Property. Journal of Political Economy, 103, 1275-88.

[26] Hadi A. S., 1992. "Identifying multiple outliers in multivariate data," Journal of the Royal Statistical Society. Series B, 54761-771

[27] Hodges, R., 1982. Dark Age Economics – the orgins of towns and trade AD 600-1000. Duckworth.

[28] Kaufmann, D., A. Kraay, and M. Mastruzzi, 2006. Governance Matters V: Governance Indicators for 1996–2005. Working Paper (World Bank)

[29] Kremer, M., 1993. Population growth and technical change: One Million B.C. to 1990. Quarterly Journal of Economics, 108, 681-716.

[30] Lipset, M.S., 1959. Some social requisites of democracy: Economic development and political legitimacy. American Political Science Review, 53, p. 69-105.

[31] Miguel, E., S. Satyanath and E. Sergenti, 2004. Economic Shocks and Civil Conflict: An Instrumental Approach. Journal of Political Economy, 112, p. 725-53

[32] Mousseau, M., H. Hegre, and J. Oneal (2003) How the Wealth of Nations Conditions the Liberal Peace. European Journal of International Relations 9(2): 277-314.

[33] Mousseau, M. 2003. The Nexus of Market Society, Liberal Preferences, and Democratic Peace: Interdisciplinary Theory and Evidence. International Studies Quarterly 47: 483-510.

[34] North, D., 1991. Institutions. Journal of Economic Perspectives, 5, 97-112.

[35] Olson Jr., M., 1963. Rapid Growth as a Destabilizing Force. Journal of Economic History, 23, p. 529-52

[36] Olsson, O, 2007. Conflict Diamonds. Journal of Development Economics 82(2): 267-286.

[37] Olsson, O. and G. Hansson, 2007. Country Size and the Rule of Law: Resuscitating Montesquieu. Working Paper (Göteborg University)

[38] Sala-i-Martin, X., G. Doppelhofer and R. Miller, 2004. Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach. American Economic Review, 94, 813-835

[39] Seabright, P., 2004. The Company of Strangers – A natural history of Economic Life. Princeton University Press.

[40] Skaperdas, S. and C. Syropoulos (2001) Guns, Better, and Openness: On the Relationship Between Security and Trade. American Economic Review, Papers and Proceedings, 91(2), 353-357.

[41] Staiger, D. and J. Stock, 1997. Instrumental variables with Weak Instruments. Econometrica 65, 557-586

[42] Voth, H-J., 1998. Time and Work in Eighteen Century London. Journal of Economic History, 58, 29-58.

A Overidentification

Testing for over identification requires us to add an instrument. A reasonable candidate is the absolute latitude of a country (ABSLAT), which Hall and Jones (1999) suggested as a potential instrument for the institutional infrastructure of a country. More recently, Rodrik et al. (2004) have employed ABSLAT as instrument for the rule of law index, which we above argued is related to the size of a country as well.

<div align="center">TABLE 5</div>

Table 5 show the results. In all cases we get the expected first stage associations between ABSLAT and our proxies for T; countries further away from the equator tend to have lower scores for our proxies of trade intensity. The partial correlations are strong as can be seen from the significance of ABSLAT conditional on country size, and from the reported F-values.

Beyond this one may observe, however, that we are forced to reject the exclusion restriction in the case involving REAL TRADE. In this case, the 2SLS estimates are therefore suspect. An interpretation of this rejection is that REALTRADE may not capture domestic trade as well as our alternative measures. This interpretation is supported by the fact that we cannot reject the exclusion restriction in the remaining two cases: TRANS and COMM. In the latter case we find a 2. stage point estimate which is virtually identical to the results reported in Table 4, whereas the estimate for TRANS is somewhat higher, suggesting a certain amount of sensitivity of the point estimate to sample size. Still, in both cases the effect is well identified within the modified samples, and the instrumentation strategy is valid.

APPENDIX

Variable	measures	source	Expected sign
POLSTAB	Political stability index. Average 1995-2005	Kaufman et al (2006)	
TRANS	Log nominal money supply to nominal GDP, 1995	World development indicators (2005)	(+)
REALTRADE	Log imports and exports to PPP GDP	World development indicators (2005)	(+)
COMM	Log phone lines per 1000 inhabitant	World development indicators (2005)	(+)
ETHNIC	Ethnic fractionalisation	Alesina et al. (200X)	(-) (Easterly/Levine 1997; Annett, 2001)
LOGY	PPP GDP per capita, 1995	World Development Indicators (2005)	(+) (Annett, 2001)
GROWTH	Growth in GDP per capita 1990-95	World Development Indicators (2005)	(-) (Olson, 1963)
NATURALR	Ores and metal exports as a fraction of total exports	World Development Indicators (2005)	(-)
SOCIALIST	Takes on value 1 if socialist regime during the 1950-95 period.	Sala-i-Martin et al (200X)	(-) Annett (2001)
URBAN	Urbanisation rate, 1995	World Development Indicators (2005)	(+) Annett (2001)
GOV	Government consumption to GDP, 1995	World Development Indicators (2005)	(+) Annett (2001)
HUMANCAP	Primary school enrolment rate, 1995	World Development Indicator (2005)s	(+) (Annett, 2001; Alesina & Perotti, 1996)
POVERTY	Head count poverty rate, 1990-1995 average	World Development Indicators (2005)	(-) Alesina & Perotti, 1996
GINI	Land gini, average 1960-90	Erickson and Vollrath (2007)	(-) Alesina & Perotti, 1996
LANDHOLDINGS	Agricultural population per land holding	Erickson and Vollrath (2007)	(-) Alesina & Perotti, 1996

TABLES

TABLE 1: CORRELATION MATRIX (N= 147)

	TRANS	REALTRADE	REALTRADE	POLSTAB
TRANS	1			
REALTRADE	0.55	1		
COMM	0.55	0.65	1	
POLSTAB	0.47	0.63	0.62	1

Notes. An outlier has been deleted for this illustration: Suriname. Detection tool: Hadi (1992, 1993)

TABLE 2: SUMMARY STATISTICS FOR SELECTED VARIABLES					
Variable	OBS	MEAN	STDEV	MIN	MAX
TRANS	153	3.46	0.76	1.41	6.5
REALTRADE	160	3.18	0.81	0.70	5.87
COMM	203	4.08	1.85	-0.23	6.91
POLSTAB	210	0.04	0.97	-2.60	1.50

TABLE 3: PARTIAL CORRELATIONS

DEPENDENT VARIABLE: POLSTAB

	1	2	3	4	5	6	7	8	9	10	11	12
TRANS	0.40^a (3.73)	0.40^a (3.61)	0.69^a (4.62)	0.31^c (1.67)	0.35^b (2.09)	0.46^a (4.75)	0.57^a (5.86)	0.30^b (2.34)	1.39^a (4.07)	0.47^c (1.88)		
REALTRADE											0.45^a (2.81)	
COMM												0.43^b (2.15)
ETHNIC	-0.57^b (2.17)	-0.84^a (2.96)	-1.07^a (3.02)	-0.72^c (1.83)	-0.98^a (3.24)	-0.61^b (2.30)	-0.67^b (2.38)	-0.85^b (2.04)	-1.22^c (1.99)	-0.97^c (1.72)	-0.89^c (1.89)	-0.96 (2.13)
LOGY	0.33^a (3.64)									0.44^b (2.03)	0.28 (1.31)	0.16 (0.61)
GROWTH		0.04^c (1.92)								-0.04 (0.87)	-0.00 (0.17)	-0.01 (0.15)
NATURALR			0.00 (1.43)							0.01 (1.67)	0.01 (1.39)	0.01^c (1.88)
SOCIALIST			-0.08 (0.37)							-0.40 (0.86)	-0.25 (0.64)	-0.27 (0.75)
URBAN					0.01^a (2.68)					-0.01 (0.80)	-.01 (0.70)	-0.01 (0.84)
GOV						0.04^a (4.58)				0.02 (0.78)	0.03 (0.90)	0.02 (0.67)
HUMANCAP							0.01 (1.09)			-0.01 (1.08)	-0.01 (0.57)	0.01 (1.04)
POVERTY								0.00 (0.06)		0.01 (1.36)	0.01 (1.17)	0.01 (1.63)
LAND GINI									-0.01 (0.01)			
LANDHOLDING									0.06 (1.68)			
REGIONS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.50	0.42	0.51	0.32	0.37	0.51	0.44	0.30	0.71	0.52	0.57	0.55
OBS	140	143	98	120	145	141	141	78	34	54	56	56

Notes: Absolute t-values in parenthesis (robust); a,b,c denotes significance at 1,5,10% respectively. The variables are: Index for political stability (POLSTAB) averaged 1995-2005, log money supply to GDP 1995 (TRANS), log exports plus imports to PPP GDP 1995 (REALTRADE), log phonelines per 1000 inhabitant 1995 (COMM), ethnic fractionalisation, log PPP GDP per capita 1995, growth in GDP per capita 1990-95, ores and metals exports in total exports 1995 (NATURALR), socialist regime 1950-95, the urbanisation rate in 1995, government consumption to GDP 1995, primary school enrolment in 1995, the 1 $ per day head count ratio average 1990-1995, Land Gini coefficient and agricultural population per holding (latest observed during the 1980-90 period).

TABLE 4: 2SLS REGRESSIONS

	SECOND STAGE: POLSTAB		
TRANS	1.35[a]		
	(5.00)		
REALTRADE		0.88[a]	
		(4.79)	
COMM.			1.00[a]
			(5.39)
ETHNIC	-0.04	-0.86[a]	0.08
	(0.06)	(3.44)	(0.21)
REGIONS	YES	YES	YES
	FIRST STAGE		
DEPENDENT VARIABLE	TRANS	REALTRADE	COMM
LOGAREA	-0.10[a]	-0.13[a]	-0.14[a]
	(2.96)	(5.14)	(4.06)
ETHNIC	-0.40	-0.01	-0.89[b]
	(1.09)	(0.03)	(2.31)
F-VALUE	23.81	27.90	18.70
ANDERSON-RUBIN (P-VALUE)	0.000	0.000	0.000
OBS	147	154	177

Notes: Absolute t-values in parenthesis (robust); a,b,c denotes significance at 1,5,10% respectively. The Anderson-Rubin test refers to the null of insignificance of the endogenous variable. The test is robust to heteroskedasticity and weak instrumentation.

TABLE 5: 2SLS REGRESSIONS

SECOND STAGE: POLSTAB			
TRANS	1.84^a		
	(7.07)		
REALTRADE		1.10^a	
		(6.10)	
COMM.			0.98^a
			(5.39)
ETHNIC	-0.48	-0.89^a	0.07
	(1.28)	(2.94)	(0.20)
REGIONS	YES	YES	YES
FIRST STAGE			
DEPENDENT VARIABLE	TRANS	REALTRADE	COMM
LOGAREA	-0.11^a	-0.13^a	-0.19^a
	(5.33)	(5.14)	(4.06)
ABSLAT	1.28^b	1.24^b	3.24^a
	(2.49)	(2.04)	(3.45)
ETHNIC	-0.26	0.53^c	-0.10
	(1.05)	(1.75)	(0.22)
F-VALUE	18.85	23.64 0	16.19
HANSEN J TEST (P-VALUE)	0.15	0.002	0.82
ANDERSON-RUBIN (P-VALUE)	0.000	0.000	0.000
OBS	121	127	138

Notes: Absolute t-values in parenthesis (robust); a,b,c denotes significance at 1,5,10% respectively. The Anderson-Rubin test refers to the null of insignificance of the endogenous variable. The test is robust to heteroskedasticity and weak instrumentation.
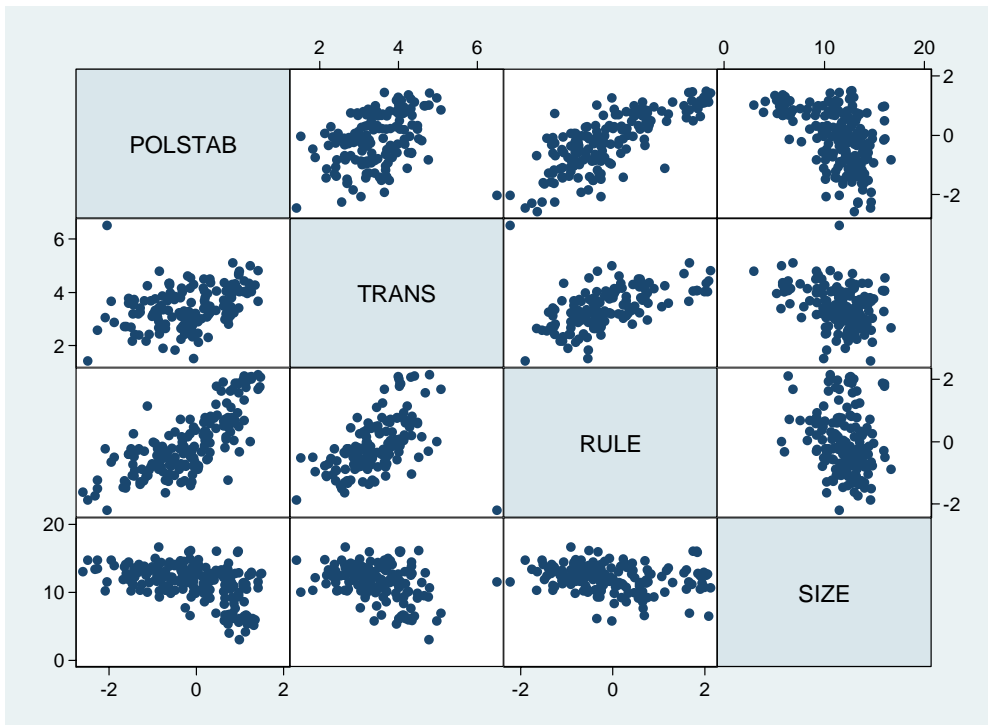
FIGURES

Figure 1. Correlations between log country size (area), rule of law (1996), TRANS and POLSTAB: 136 countries. *Notes:* For this illustration Suriname has been deleted. All depicted correlations are statistically significant at 5% or better.