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Why are rich countries more politically cohesive?*

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Abstract

We document empirically that rich countries are more politically cohesive than poorer countries. In order to explain 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 non-cohesive under self-sufficiency, the political decision making process becomes cohesive in the market economy, as the welfare of individuals will be mutually interdependent due to the exchange of goods. We refer to this latter state as "capitalist cohesion".

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

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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.

It should be uncontroversial to assert that political instability reflects a basic lack of political *cohesion* between opposing political sides. But that only begs the question of why some countries are more politically cohesive than others. The present paper develops a theory of how political cohesion may arise endogenously during the process of development.

The central hypothesis advanced below is that the nature of the political struggle between groups is critically affected by the organization of the economy; the paramount institution in this regard is the market institution itself. That is, whether (the members of) rival political groups are exchanging goods in a market or not. We demonstrate that once inter-group market exchange is initiated, the nature of the political process changes and becomes more cohesive. We argue that the theory is capable of shedding light on both the historical patterns and the observed cross-country correlation between political cohesion and prosperity. At the more detailed level 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. In this sense the political process is non-cohesive.

Consider instead the polar opposite case: A fully developed market economy. 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, intuitively making political instabilty and conflict much less likely. Moreover, output per capita rises due to the gains from specialization and because of more efficient political outcomes. We refer to this state as that of "capitalist cohesion".

In spite of its attractiveness, 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

[1] In contemporary Africa opposing political sides are often defined along ethnic lines. But in some cases different ethnic groups are in fact also 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 in Ghana.

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 contemporary cross-country correlation between income and political cohesion that we document below. The theory suggests, in addition, that causality runs in either direction. On the one hand, economic progress and domestic market exhange enables a transition into a cohesive political climate. On the other hand, a more cohesive political environment enables more efficient political outcomes, which spurs productivity.

While the model we develop does not focus on political instability *per se*, it should be clear that our theory is related to research that studies the orgin of such instability. Consider, for instance, 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 hypothesis are perfectly reconcilable; a lack of (willingness to) exchange goods 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.

Hence, insofar as political instability is a symptom of a lack of political cohesion our 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 and Perotti, 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. Acemoglu and Robinson, 2000; Alesina et al., 1996; Barro, 1991).[2]

[2] A major implication of the present paper is that cohesion arises gradually during development. From this perspective the work of Galor et al (2009) and Galor and Moav (2006) are related. In these works, however, "consensus" over political choices emerges because of capital-skill complementarity which makes rival political groups interdependent (i.e., workers and capitalists). The present paper contains a different consensus creating

The paper is also related to a (primarily political science) literature that studies a phenomenon often referred to as "the liberal peace", i.e. that democratic and market-oriented countries usually do not fight with each other.[3] 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 cohesion and economic development. In section 3, develops the model and section 4 discusses the implications of the model. Finally, section 5 concludes.

2 Motivating Evidence

The central hypothesis of the present paper is that political cohesion may emerge endogenously during development. In this section we begin by documenting that, as a matter of cross-country correlations, richer countries are on average charactarized by a greater degree of political cohesion. It should be stressed at the outset that we make no attempt to establish causality. Instead we view the correlation as an interesting stylized fact, which needs to be accounted for. The theory developed below is capable of doing just that.

In addition to the cross country exercises, we discuss historical evidence which suggest that the industrious revolution, the gradual commercialisation of economic activity, ushered the beginning of a more politically stable

mechanism: the market mechanism itself.

[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.

environment in Europe in general, and in the UK in particular. The historical record thus provides some suggestive reduced form evidence of the main mechanism advocated below: as citizens' increasingly rely on each other via trade their welfare becomes intertwined prompting their political views to converge. As observed in the Introduction, this kind of convergence of political views may well be an important reason why richer economies tend to be more politically stable than poorer countries.

2.1 Cross-Country Data

A fully satisfactory measure of the extent of political cohesion is probably impossible to construct in light of the huge number of dimensions over which an individual can hold a "political view". Hence, we will have to make do with a proxy.

In contructing a measure of political cohesion we rely on survey data from the World Value Survey (WVS). In the WVS respondents are confronted with a one-to-ten scale, and asked: "*In political matters, people talk of "the left" and "the right". How would you place your views on this scale, generally speaking?*". In order to capture political cohesion we first calculate the percentage of the respondents that put themselves at the two extremes. That is, the fraction of the respondents who answered either "one" or "ten". "Political cohesion" is then thought to be rising if the fraction of respondents at the extremes *shrink*. Hence, the variable "political cohesion" is defined as 100-(fraction of respondents answering "one" or "ten"). In order to obtain as large a country sample as possible we used the results from pooling WVS from the period 1981-2000.[5] This leaves us with a sample of 71 country observations.

It should be recognized that the notion of "left" and "right" unquestionably differs from one country to the next. For instance, a "right wing" politician in Scandinavia is a completely different sort of character than a right wing politician in the US. At the same time it is clear that individuals who answer "one" or "ten" are deliberately signalling extreme political views in the context of their local political landscape. Hence, fewer "extremists" seems to be a context independent measure of political "distance" between the members of any given populous, or, of a greater degree of political cohe-

[5] The data can be obtained online at http://www.worldvaluessurvey.org/.

sion. Accordingly, whereas the absolute (average) political view is difficult to compare across countries, we maintain that deviations from the (country specific) "center" is a comparable measure of the extent of political cohesion in a society. As a parsimonious measure of economic development we employ (PPP) GDP per capita. As our political cohesion variable reflects surveys from the period 1981-2000, we employ GDP per capita at roughly the midtpoint: 1990.

>Figure 1 here<

Figure 1 shows the simple correlation between our measure of political cohesion and GDP per capita. As is visually obvious, the two variables are highly correlated. The amount of variation in the political cohesion variable is noteworthy: in the poorest countries in the sample it is not uncommon to find 30% or more of the population at the political extremes. By way of contrast, in rich places like Germany, Austria and Norway, less than 10% of the population feels that they are either "extreme leftish" or "extreme right wing". One may also observe three major outliers in the figure: Vietnam, Tanzania and Pakistan. Whereas Vietnam and Tanzania are charactarized by very low levels of cohesion, Pakistan is uncommonly cohesive for its income level. In order to examine the robustness of the correlation between cohesion and prosperity we resort to regression analysis.

As far as we are aware, no other study has examined the determinants of political cohesion. Hence, we have no previous study on which to rely in choosing appropriate additional controls. Consequently we have chiefly selected variables that have been suggested as determinants of political instability in previous studies (e.g., Alesina and Perotti, 1996; Annett, 2001): Ethnic fractionalization; the urbanisation rate and primary schooling. In addition we check robustness against the inclusion of population size, age composition of the population and the unemployment rate. Finally, we include a full set of continent fixed effects. As the WVSs are from the period 1981-2000 we measure the controls mid period, in 1990. All data on the controls are from the World Development Indicators CD-rom. Table 1 reports the results from standard OLS regressions of political cohesion on GDP per capita and the above mentioned controls.

>Table 1 here<

Column 1 shows the basic link between GDP per capita and political cohesion; the former is able to motivate about 50% of the variation in the latter. If we were to take the point estimate at face value it would suggest that an increase in log GDP per capita of one percent increases cohesion by about six percentage points. In practise of course, the correlation may well reflect reverse causality and omitted variables. To check for the latter, the next seven columns show how the partial correlation between GDP per capita and cohesion is affected by including additional controls. GDP per capita retains its significance in all cases; only when we control for the age composition of the population are we able to reject significance at the 5% level, but not at 6%. In the final column we include all controls at once. In spite of the rather small sample, GDP per capita is significant.

To check for outliers we did two things. First, we employed the Hadi (1992) outlier detection procedure, which identifies (as expected, cf. Figure 1) Vietnam, Tanzania and Pakistan as outliers. In addition, Puerto Rico is singled out. We subsequently re-ran the regressions above omitting these four observations from the data set. The results (available upon request) show that GDP per capita is significant at the one percent level of confidence in all specifications.

Admittedly, we have no knowledge of whether these four observations are conveying misleading information. From this perspective one may worry about dropping them from the data set.

Hence, as a second check we ran outlier robust median (least absolute deviation, LAD) regressions on the full data set (these results are also available upon request). Once again we find GDP per capita to be significant in all specifications at the five percent level or better. In sum, GDP per capita would seem to be a rather robust correlate with political cohesion.

Naturally, these results do not establish that GDP per capita increases political cohesion; political cohesion may well be influencing GDP per capita. Indeed, according to the proposed theory we would expect this to be the case. In addition, the theory does not imply that GDP per capita matters to cohesion *per se*; it is the process of specialization and the development of market exchange which influence the political process. Still, as these developments work to elevate living standards, we expect GDP per capita to be a reasonable proxy. Nevertheless, to gain some additional motivation for the advocated mechanism, linking GDP per capita and political cohesion,

we next turn to the historical record.

2.2 The Historical Record

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 people's 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 extent 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.[6]

Turning to the crux of the 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".*

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

[6] 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.

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.[7]

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.

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 adulthood. 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 population 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 economic regime they prefer to be in: Self-sufficiency (S) or market economy (M), i.e. whether they wish to engage in trade with each other or not.

2. The groups divide up a common productive resource (R) between them through political bargaining, conditional on the economic 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.

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

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

During youth, individuals are brought up and acquire human capital. In addition they share consumption with their parent. Individuals are economically active only during adulthood. 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.[8] For simplicity, we will also assume that population levels remain constant throughout the analysis.[9]

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

$$U_\lambda = U\left(a_\lambda, m_\lambda\right) = a_\lambda^\alpha m_\lambda^\beta, \ \lambda = m, a \tag{1}$$

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 1 unit 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

$$1 = x_{m\lambda} + x_{a\lambda}, \tag{2}$$

[8] 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 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".

[9] The model can be generalized to allow fertility to be endogenous without implications for the key results below. Specifically, suppose preferences are defined over the two final goods and fertility, n. Assume that time is allocated between production and fertility. Then, since preferences are identical Cobb-Douglas across locations the rate of population growth would be the same, and the relative level of population constant.

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

3.2 Production

The production technologies are

$$m_\lambda = R_\lambda h_{m\lambda} x_{m\lambda}^{\gamma_\lambda} \tag{3}$$

$$a_\lambda = R_\lambda h_{a\lambda} x_{a\lambda}^{\delta_\lambda}, \tag{4}$$

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 through political bargaining. 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

$$\gamma_m = \delta_a > \gamma_a = \delta_m \tag{5}$$

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:

$$\frac{\delta_a}{\gamma_a} > \frac{\beta}{\alpha} > \frac{\delta_m}{\gamma_m} \tag{6}$$

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:

$$h_{i\lambda t+1} = Ax_{i\lambda}h_{i\lambda t}^{\eta}, \text{ for } i = a, m;\ \lambda = a, m;\ h_{i0} \text{ given.} \tag{7}$$

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

$$\frac{h_{a\lambda t+1}}{h_{m\lambda t+1}} = \left(\frac{Ax_{a\lambda}}{Ax_{m\lambda}}\right)\left(\frac{h_{a\lambda t}}{h_{m\lambda t}}\right)^{\eta}. \tag{8}$$

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

$$\frac{\tilde{h}_{a\lambda}}{\tilde{h}_{m\lambda}} = \left(\frac{x_{a\lambda}^*}{x_{m\lambda}^*}\right)^{\frac{1}{1-\eta}}. \tag{9}$$

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 $\lambda = a, m$,

$$x^*_{m\lambda} = \arg\max \left\{ \left(R_\lambda h_{a\lambda} \left(1 - x_{m\lambda}\right)^{\delta_\lambda} \right)^{\alpha} \left(R_\lambda h_{m\lambda} x^{\gamma_\lambda}_{m\lambda} \right)^{\beta} \right\}$$

The straightforward solutions for the time allocation problem are

$$x^*_{a\lambda} = \frac{\alpha\delta_\lambda}{\alpha\delta_\lambda + \beta\gamma_\lambda},\ x^*_{m\lambda} = \frac{\beta\gamma_\lambda}{\alpha\delta_\lambda + \beta\gamma_\lambda},\ \text{for } \lambda = a, m$$

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

$$V^S_\lambda \equiv \Omega_\lambda h^\alpha_{a\lambda} h^\beta_{m\lambda} R_\lambda \text{ for } \lambda = a, m. \tag{10}$$

where $\Omega_\lambda = \frac{(\alpha\delta_\lambda)^{\alpha\delta_\lambda}(\beta\gamma_\lambda)^{\beta\gamma_\lambda}}{(\alpha\delta_\lambda+\beta\gamma_\lambda)^{\alpha\delta_\lambda+\beta\gamma_\lambda}}$.

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:

$$\frac{\tilde{h}_{a\lambda}}{\tilde{h}_{m\lambda}} = \left(\frac{\alpha\delta_\lambda}{\beta\gamma_\lambda} \right)^{\frac{1}{1-\eta}} \tag{11}$$

From (6), 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 $\tilde{h}_{aa}/\tilde{h}_{am}$:

$$\frac{\tilde{h}_{aa}}{\tilde{h}_{am}} = \left(\frac{\delta_a}{\delta_m} \frac{(\alpha\delta_m + \beta\gamma_m)}{(\alpha\delta_a + \beta\gamma_a)} \right)^{\frac{1}{1-\eta}} > 1 \tag{12}$$

Analogously, it is easily shown that $\tilde{h}_{mm}/\tilde{h}_{ma} > 1$.[10] 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.

[10] A short proof of the result in (12): $\tilde{h}_{aa}/\tilde{h}_{am} > 1$ if $\delta_a\left(\alpha\delta_m + \beta\delta_a\right) > \delta_m\left(\alpha\delta_a + \beta\delta_m\right)$, 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 (5).

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:

$$y_m = m_m + pa_m, \tag{13}$$

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 $x_{mm} = 1$. This means that total income is

$$y_m = m = h_{mm} R_m. \tag{14}$$

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:

$$m_\lambda = \frac{\beta y_\lambda}{\alpha + \beta}, \; a_\lambda = \frac{\alpha y_\lambda}{p(\alpha + \beta)}, \text{ for } \lambda = a, m. \tag{15}$$

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

$$\frac{h_{mm} R_m L_m}{h_{aa} R_a L_a} = \frac{\frac{\beta}{\alpha+\beta}\left[y_m L_m + y_a L_a\right]}{\frac{1}{p}\frac{\alpha}{\alpha+\beta}\left[y_m L_m + y_a L_a\right]}$$

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

$$p^* = \frac{\alpha}{\beta}\frac{h_{mm}R_mL_m}{h_{aa}R_aL_a}. \tag{16}$$

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

$$V_a^M = \alpha\left(h_{aa}R_a\right)^{\alpha}\left(h_{mm}R_m\right)^{\beta}\left(\frac{L_m}{L_a}\right)^{\beta} \tag{17}$$

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

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 cohesive political climate, as described below.

3.6 Bargaining outcomes

As mentioned above, the political "struggle" takes place in the second stage over the allocation of the resource $R = R_a + R_m$.

3.6.1 Division of the resource under self-sufficiency

The political 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:

$$\max_{R_a,R_m} N^z = \left(V_a^z\right)^{\pi}\left(V_m^z\right)^{1-\pi},\ z = S, M \tag{19}$$

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.

In general, this formalization should be regarded as a metaphor for something 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: (**No political cohesion**). *The bargaining solution under self-sufficiency is* $R_a^* = \pi R$, $R_m^* = (1-\pi) R$. *The bargaining power of the political groups determine allocations.*

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

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

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. In this sense the political struggle is non-cohesive as the two individual fractions of society simply attempt to grab as large a fraction of the resource as possible for their own benefit.

3.6.2 Division of the resource in the market economy

After substituting for the indirect utility levels of the two groups from (17) and (18) 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: (**Political Cohesion**). *The bargaining solution in the market economy is $R_a^* = \alpha R$, $R_m^* = \beta R$. The solution is unanimously agreed upon by the individual groups of society.*

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 a commonly agreed upon outcome of the political process - i.e. capitalist cohesion - in the market regime.

3.7 Choice of regime

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

In periods of self-sufficiency, agents in the two regions consider the option of starting to trade with each other. 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.[11] Finally, the costs of trading could also be influenced by animosities between groups, which produces a "psychic" utility cost of interacting. To capture 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

$$\frac{V_a^M}{V_a^S} = \Lambda \cdot \frac{\alpha}{\pi} \left(\frac{h_{mm}}{h_{ma}} \right)^{\beta} \left(\frac{L_m}{L_a} \right)^{\beta} \tag{20}$$

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 individuals in region m is

$$\frac{V_m^M}{V_m^S} = \Lambda \cdot \frac{\beta}{(1-\pi)} \left(\frac{h_{aa}}{h_{am}} \right)^{\alpha} \left(\frac{L_a}{L_m} \right)^{\alpha}. \tag{21}$$

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

[11] Grossman and Kim (1995) model such "defensive" and "offensive" expenditures explicitly. Offensive expenditures relate to costs associated with expropriating funds from other individuals. They show that under certain circumstances individuals will refrain from investing in "offensive" measures, thus motivating scenarios where property rights are secure.

occur

$$a : \frac{V_a^M}{V_a^S} > C; \quad m : \frac{V_m^M}{V_m^S} > C. \tag{22}$$

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 individuals' bargaining power is π. So the gains for m-people 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.[12]

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.[13]

[12] 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.

[13] Formally, for m-types, we can deduce from (12), (21), and (22) that a transition

4 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-cohesive in nature, as groups try to grab as large a proportion of the resources that they possibly can 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 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 - i.e. 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 and, moreover, prosperity increases.

A transition to a market economy is only inevitable if the gains from specialization increase 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.

While cohesion and prosperity thus should be positively correlated it is worth observing that the link could be violated in a cross-country context. To illustrate; consider two different economies, where one is richer than

to a market economy will only evolve endogenously if $\frac{\tilde{h}_{ag}}{\tilde{h}_{am}} = \left(\frac{\delta_a}{\delta_m}\frac{(\alpha\delta_m+\beta\gamma_m)}{(\alpha\delta_a+\beta\gamma_a)}\right)^{\frac{1}{1-\eta}} > \frac{L_m}{L_a}\left(\frac{C(1-\pi)}{\Lambda\beta}\right)$. 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.

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 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 cohesion, 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.

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 in our simplified model since specialization 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 we have that $h_{am}, h_{ma} > 0$ always holds so that it is not completely impossible to return to self-sufficiency. The expressions in (21) and (20) 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 (21), 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. We do expect, however, that conflicts spawned by the greed motive should become less pervasive once extensive trading relations between citizens have been established.

5 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, needless 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? Our model might serve as a basic framework for further research in this area.

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A Figure and Table

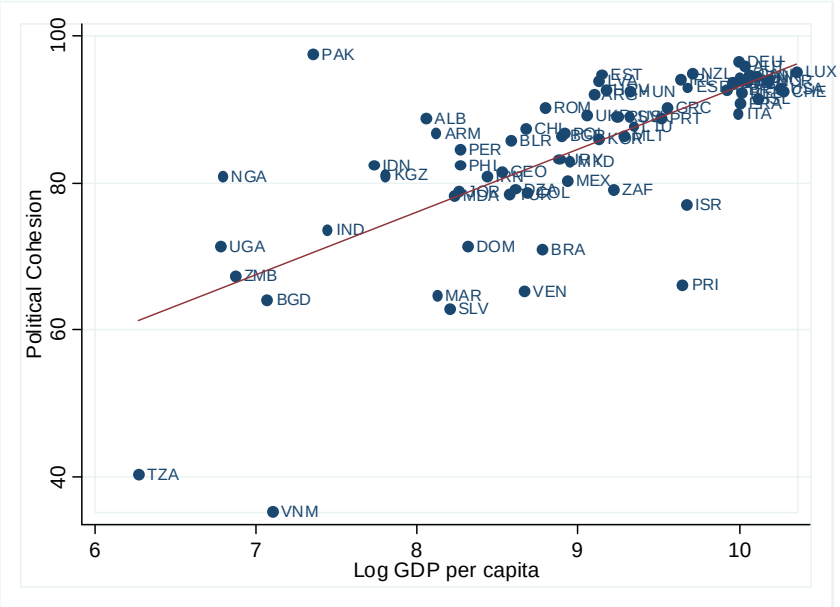

Figure 1: The figure shows the correlation between log GDP per capita and political cohesion, as described in the text. The latter variable is measured over the period 1981-2000, whereas GDP per capita is measured in 1990. 71 countries are represented in the figure. *Notes*: (a) The correlation between the two variables is 0.67, and significant at 1%. (b) The illustrated line is estimated by OLS; see Table 1, column 1 for details.

Table 1. Determinants of Political Cohesion
Dependent variable: Political Cohesion

GDP pc	8.50[a]	8.47[a]	9.58[a]	8.45[a]	4.63[c]	5.82[b]	7.76[a]	9.35[a]	5.55[a]
	(1.56)	(2.11)	(2.11)	(1.99)	(2.41)	(2.47)	(2.19)	(2.31)	(2.03)
Ethnic			7.10						-0.40
			(5.99)						(3.89)
Population				-0.05					-0.34
				(.60)					(0.56)
Population1564					0.86[b]				0.72[c]
					(.36)				(0.38)
Unemployment						-0.50[c]			-0.16
						(.26)			(.15)
Urbanization							0.04		-0.07
							(.09)		(0.09)
Primary school								0.16	0.29[b]
								(.15)	(0.11)
Continent fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71	71	70	71	71	48	71	66	46
R^2	0.48	0.51	0.57	0.51	0.55	0.49	0.51	0.65	0.80

Notes: (1) a, b and c denotes, respectively, significance at 1,5 and 10%. (2) Robust standard errors in paranthesis, (3) All regressions contain a constant. (4) All regressions estimated by OLS.