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Theory of Social Transformation, Political Transition and Economic Growth

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Abstract

In this paper, I develop a model of sociopolitical transition that links sociopolitical transformational process of countries to the dynamic process of output per capita and economic growth. Social polarization breeds discriminatory practices regarding government redistribution. This brings about inefficient allocation of resources away from production to political power struggle leading to poor economic outcomes. However, the model shows that social integrative processes may correct this inefficiency over time depending on the degree of social fractionalization, the level of social distance between the groups, the level of production technology, etc. Even though the model predicts long-run convergence of growth rates and output per capita across countries, it shows possible prolonged divergence of these economic variables.

Keywords: economic growth, fractionalization, integration

JEL Classification: O41, O43

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1 Introduction

After the Second World War, economists started to show greater interest in finding answers to what causes the large gaps among countries of the world in terms of economic growth and output per capita. This took a more interesting turn in the 1950s and 1960s when neoclassical economists like Solow (1956), Cass (1965) and Koopman (1965) published models predicting eventual convergence of economic growth rates and GDP per capita among countries of the world. Yet, as time passed by, few signs, if at all, emerged that showed that this prediction was taking hold. This led to the emergence of endogenous growth models in the late 1980s and early 1990s (see, for instance, Romer (1986 and 1990), Lucas (1988) and Azariadis and Drazen (1990)), which predicted that the differences in growth rates and GDP per capita between the developed world and the developing world may perpetuate. What all these models have in common is that they assume away the social and political environments economies operate in. That is, these models treat countries as if they have similar social and political environments. Yet, since countries differ considerably in terms of the level of sociopolitical development and maturity, and since economic outcome is immensely influenced by sociopolitical environment, this kind of treatment makes these models incomplete, and it thus renders their predictions less accurate. Therefore, by embedding the sociopolitical transformational process of countries into the choice process of economic agents, the model in this paper is able to offer stronger explanation for the dynamic behavior of output per capita of countries thereby providing a more accurate explanation for the gaps among countries in terms of economic growth and development.

I argue in this paper that social fractionalization in terms of ethnicity, race, religion, etc. breeds discriminatory practices thereby creating political tensions. This results in inefficient use of economic resources to struggle for political power in order to take control of government machinery for the purpose of being in charge of the government's redistribution mechanism. That is, I show that ethnic/racial or religious fragmentation ultimately leads to economic inefficiency and thus poor economic outcomes. However, I show that social dynamics may minimize this inefficiency over time thereby enhancing economic performance as countries undergo sociopolitical transformation. And since this process may differ from one country to another, gaps will emerge among countries in terms of output per capita and economic growth, especially at the initial stage of the sociopolitical process.

The economy in this model is populated by two groups of people. The groups are defined along ethnic, racial or religious lines. I assume that the government formed by a group is not different from the group as a whole in terms of its objectives. Like Pham (2005), van Long and Shimomura (2004), Corneo and Jeanne (2001), Rauscher (1997), Fershtmam et al. (1996), etc. individuals in this model derive utility from both consumption and social status[2] . However, unlike these models in which social status is determined by relative wealth, relative consumption or the level of education, social status of individual group members in this model is determined by the extent to which the group's sociocultural or religious values or philosophy is promoted. This means that a group would like to control the government and

[2]This utility specification follows Adam smith's assertion in his 'Theory of Moral Sentiments' that human economic activities do not only aim at supplying necessities of life (consumption) but also aim at attaining higher social status.

thus have political power because the group is able to more effectively advance its sociocultural or religious values or ideology when in power than when in the opposition. Power struggle between the groups may be so intense at the initial stage of the country's formation that legal or democratic framework established to dictate smooth power transition may not work because of presence of incentives to deviate from established rules. That is, the intensity of political power struggle at the initial stage may be relatively high, and may thus take violent forms. This is the source of the economic inefficiency at the initial stage. However, as the groups become more socially integrated, this inefficiency will diminish over time thereby enhancing economic growth. Nevertheless, the rate of social integration may differ from one country to another resulting in different growth rates of per-capita output across countries.

Factors that have been cited in the literature to account for social integration include education (see, for instance, de Palo, Faini and Venturini (2006)) and intermarriages (see, for instance, Furtado (2006)). In this model, I emphasize the later. That is, as intermarriages increase, the groups become more socially integrated, and the intensity of political power struggle and its accompanying economic inefficiency evaporates, since economic resources get reallocated towards productive use.

Although empirical work (see, for instance, Easterly and Levine (1997) and Knack and Keefer (2002)) has seriously taken into account the crucial role social fragmentation plays in limiting economic growth and thus creating divergence of growth rates across countries, theoretical work in this area tends to take an indirect approach in linking social

fragmentation to economic growth and output per capita (see, for instance, Alesina and Drazen (1991), Alesina and Spolaore (1997)). That is, these models tend to link social fragmentation to issues like public goods provision and macroeconomic stabilization. This paper therefore contributes to this literature by developing a theoretical model that directly links social polarization to the dynamic behavior of per capita output. On the empirical front, Easterly and Levine, for instance, find a very strong negative correlation between ethnic divisions and economic growth. Most interestingly, Easterly and Levine find that ethnic fragmentation is strongly and significantly correlated to many of the conditional variables in growth regressions, when a measure of ethnic fractionalization serves as an independent variable to these variables in regressions. This, they argue, suggests that these factors are endogenous to ethnic fragmentation, conforming to one of the main assertions in this paper that the main cause of political tension that brings about distortions and inefficiencies regarding allocation of economic resources leading to economic under-performance is social fragmentation.

The rest of the paper is organized as follow. Section 2 discusses related literature, section 3 presents the model and section 4 concludes the paper.

2 Related Literature

This paper relates to three strands of economics literature. First, it relates to models that seek to explain the dynamic behavior of output per capital of countries. As I said above, the model in this paper differs from the other models in this area by incorporating sociopolitical evolutionary process into economic choice process, while the other models

in this literature generally concentrate on the nature of the production function and how it impacts the dynamics of per-capita output, while implicitly assuming similar social and political environments for countries. That is, these models fail to answer the fundamental question of how sociopolitical evolutionary process of countries affects the dynamic behavior of output per capita.

The second strand of literature that this paper relates to is the literature on social conflicts (see, for instance, Grossman (1991), Acemoglu and Robinson (2001), Roemer (1995), Tornell and Velasco (1992)). Grossman develops a theory of insurrections that treats insurrection and its deterrence as economic activities that compete with production of goods. This model adopts a similar stand by arguing that allocating resources for political power struggle or political conflicts is pareto inefficient, and it decreases resources available for production. However, this paper goes beyond this idea by showing how social integration helps minimize the amount of resources inefficiently allocated towards political power struggle. Acemoglu and Robinson model the complications created by the existence of different social groups in a country as the country undergoes political transition. The social groups in Acemoglu and Robinson's model are the rich who dislike democracy because of its redistributive effect and the poor who want democracy. However, the social groups in this model are ethinc, racial or religious in nature, and their objective is not either to democratize or not, but they struggle for political power to advance their sociocultural or religious values or ideologies with the goal of attaining higher social status, since that is an input into individual utility function.

Third, this paper relates to the literature that links social fragmen-

tation to economic performance of countries (see, for example, Alesina and Drazen (1991), Alesina and Spolaore (1997), Alesina, Baqir and Easterly (1999)). As I argued above, these models tend to link social fragmentation to issues like public goods provision and macroeconomic stabilization. However, this paper takes a more direct approach in linking social fragmentation to the dynamics of output per-capital and economic growth by showing how social dynamic process relaxes the political complications associated with social divisions. That is, this paper shows how social integrative process reallocates resources from inefficient use (political power struggle or even political conflicts) to efficient use (production).

3 The Model

3.1 The Setting

Consider an economy in which there are two groups of people: groups X and Z. The groups are defined along ethnic, racial or religious lines. Let N_t^x and N_t^z respectively represent the population sizes of X and Z at time t. Also, Let these groups have identical members so that x and z are representative members of groups X and Z respectively. Let $N_{t+1}^i = (1+n)N_t^i$, $i = x, z$. Thus, I assume that the groups have identical population growth rates.

Let x and z be each endowed with H units of a composite resource at every t. H can either be used as the input to produce a composite commodity y (h), and/or as the means of struggling for political power (m). This means that at every t, $H = h_t^i + m_t^i$, for $i = x, z$. Pareto

efficiency requires that at every t, $(h_t^i \quad m_t^i) = (H \quad 0)$. This implies that any amount of the resource allocated towards struggle for political power is economically inefficient.

Production is through the following technology: $y_t = \phi_t h_t$, where y_t is output per capita, ϕ_t is is the technology parameter. ϕ_t represents global technology parameter, since I assume that there is international technological diffusion.

Suppose that at $t = 0$, the country is formed, either through independence from direct foreign control (or occupation) or by any other means. The joining together of X and Z to form one country is exogenous, and not by choice[3]. In this model, a geographical location populated by people is considered to be a country only if it has a defined territory, it is sovereign, and it is thus independent from direct foreign control or occupation[4]. Let us suppose that at $t = 0$ the government is formed by members of group X.

Individuals derive utility from consumption and social status. Social status of individual group members is measured by the extent to which the group promotes its sociocultural or religious values. Now, let non-probabilistic utility functions of x and z at t be as follows:

$$U_t^i = aC_t^i + bV_t^i,\ i = x, z. \qquad (1)$$

Where C is consumption and V is the level of implemented so-

[3]This, in fact, is in conformity to what happened in practice to many countries after European colonization. For instance, the Akan tribal regions and the non-Akan tribal regions were joined together to form the Gold Coast (later changed to Ghana) by the British; the northern Arabs and the southern Black Africans were joined together to form Sudan; etc.

[4]For this reason, any time a populated geographical location does not satisfy any of these conditions, it ceases to be a country, even though a new country may be formed later. From this definition, a country like modern Egypt is considered to have been formed only when it regained independence from Britain.

ciocultural values of a group, while a and b respectively measure the importance individuals attach to consumption and social status (as measured by the level of implemented sociocultural values). I assert that as a result of cultural indoctrination, people of different cultural backgrounds tend to feel that their cultural or religious values or philosophy is superior to others, at least at the initial stage of a country's formation. This, in fact, is the cause of the feeling of ethnic/racial or religious superiority. This feeling of superiority is generally greater the more different the groups are in terms of social characteristics like language, religion, race/ethnicity, and others. As a result of this, if the country is so ethnically/racially or religiously divided and fragmented, members of group X would feel more socially elevated if the government is controlled by group X. This is due to the fact that a group is able to more effectively implement its sociocultural or religious values or philosophy when in power than when in the opposition. That is, if X is in power $V_t^x \geq V_t^z$ (and vice versa, if Z is in power). Let the level of promoted sociocultural or religious values or philosophy of a group be equivalent to the level of government spending in favor of that group. This means that the government formed by group X, for instance, favors members of group X more than members of group Z. Thus, the government of X discriminates against members of group Z. I further assume that the government does this by adopting fair taxation, but uses unfair lump-sum transfers.

Let τ be the per-capita lump-sum tax of the government. For now, suppose that $N_t^x = N_t^z$. This means that total government tax revenue (Γ_t) is $\Gamma_t = \tau N_t^x + \tau N_t^z = 2\tau N_t^i = TN_t^i$, where $T = 2\tau$ is tax revenue from x and z. If G_t^i is the government's transfer to $i = x, z$, then let the

government's transfers to groups X and Z at every t be respectively as follows:

$$N_t^x G_t^x = \alpha_t \Gamma_t = \alpha_t T N_t^x$$

$$N_t^z G_t^z = (1-\alpha_t)\Gamma_t = (1-\alpha_t) T N_t^z \qquad (2.a)$$

Dividing the two equations in $(2.a)$ by $N_t^i = N_t^x = N_t^z$, per-capita transfers are

$$G_t^x = V_t^x = \alpha_t T$$

$$G_t^z = V_t^z = (1-\alpha_t) T \qquad (2.b)$$

Where α_t is the fraction of total government tax revenue that is transferred to group X. With the present assumption that $N_t^x = N_t^z$, α_t is also the fraction of tax revenue from x and z (T) that is transferred to x. Now, as long as the social groups discriminate in their own favor when they are in power, $\alpha_t > \frac{1}{2}$. Note that if in power, the government formed by Z is assumed to engage in the same discriminatory practice. Now, let

$$\pi_t = G_t^x - G_t^z = V_t^x - V_t^z = \alpha_t T - (1-\alpha_t)T = (2\alpha_t - 1)T \qquad (3)$$

Where π_t measures the degree of ethnic/racial discrimination. π_t (and for that matter α_t) is influenced by social characteristics of X and Z. This point is further explained in section 3.2. With the government formed by X assumed to be in power, the non-probabilistic utility function in equation (1) can therefore be re-written as:

$$U_t^x = aC_t^x + bG_t^x$$

(4)

$$U_t^z = aC_t^z + b(G_t^x - \pi_t)$$

The two equations in (4) indicate that the size of π_t is utility reducing to z because the government formed by X transfers some income away from z to x through redistribution of tax revenue because of the climate of discrimination that results from each group's desire to promote its sociocultural or religious values at the expense of the other group.

3.2 Social Integration

Let individuals attach importance to the welfare of relatives. This means that as intermarriges between the groups increase and the groups become socially integrated through family links, discrimination against the rival group becomes costly to members of the governing group. This implies that social integration generated by inter-group marriages decreases the degree of discrimination[5]. Now, let s_t^{im} be the proportion of all marriages that are intermarriages at time t. This means that $1 - s_t^{im} = s_t^{sm}$ is the proportion of marriages between people from the same social group. As it is expected, let us assume that $s_0^{sm} > s_0^{im}$. Since social integration decreases the degree of discrimination, let the fraction (of tax revenue) transferred in lump sum to the representative member of the rival group by the governing group at time t $(1 - \alpha_t)$ be positively related to the proportion of intermarriages in the society (s_t^{im}) as follows:

[5] Also, if we assume that members of the government formed by one group are probabilistically chosen from the group, then as intermarriages and thus members of the group who trace their parentage from the other group increase, we will have the degree of discrimination to decrease over time.

$$1 - \alpha_t = f(s_t^{im}) \implies \alpha_t = 1 - f(s_t^{im}) \qquad (5)$$

Equation (5) implies that to know how α_t evolves over time, we should know how s_t^{im} evolves over time. The vector $S_t = (s_t^{sm} \quad s_t^{im})$ evolves according the Markov process. Consider the following Markov transition matrix:

$$P = \begin{bmatrix} r & q \\ q & r \end{bmatrix} \quad r, q \geq 0,$$

Where r is the probability that a person from group i will marry from group i, while q is the probability that a person from group i will marry from group j. Let us suppose here that the society is patrilineal (or matrilineal, as the choice doesn't matter here), meaning that children belong to their fathers' lineage.

As a characteristic of the Markov chain, let P be a stochastic matrix. That is, $r + q = 1$. As it is expected, let us further assume that $r > q > 0$ (we shall consider later what happens in the extreme case if this assumption does not hold.). Also, we expect that $r \geq \frac{1}{2}$. It should be pointed out here that if $r, q >> 0$, P has a unique stationary distribution in the limit – the process is asymptotically stationary. Before I continue with the analysis, let me point out that the size of q is determined by the social distance between the two groups in terms of language, race/ethnicity, religion, etc. The more socially different X and Z are, the smaller the q (and thus the bigger the r) and vice versa. That is, groups with very different social characteristics tend to have smaller probability of intermarrying and vice versa.

Now, given that $S_0 = (s_0^{sm} \quad s_0^{im})$ and $P = \begin{bmatrix} r & q \\ q & r \end{bmatrix} = \begin{bmatrix} r & 1-r \\ 1-r & r \end{bmatrix}$, by Markov chain[6],

$$S_t = \begin{bmatrix} s_t^{sm} & s_t^{im} \end{bmatrix} = \begin{bmatrix} s_0^{sm} & s_0^{im} \end{bmatrix} \begin{bmatrix} r & 1-r \\ 1-r & r \end{bmatrix}^t \qquad (6)$$

$\begin{bmatrix} r & 1-r \\ 1-r & r \end{bmatrix}^t$ can be expanded as follows[7]:

$$\begin{bmatrix} r & 1-r \\ 1-r & r \end{bmatrix}^t = \begin{bmatrix} \frac{1}{2} + \frac{1}{2}(2r-1)^t & \frac{1}{2} - \frac{1}{2}(2r-1)^t \\ \frac{1}{2} - \frac{1}{2}(2r-1)^t & \frac{1}{2} + \frac{1}{2}(2r-1)^t \end{bmatrix}$$

Equation (6) can therefore be re-written as

$$S_t = \begin{bmatrix} s_t^{sm} & s_t^{im} \end{bmatrix} = \begin{bmatrix} s_0^{sm} & s_0^{im} \end{bmatrix} \begin{bmatrix} \frac{1}{2} + \frac{1}{2}(2r-1)^t & \frac{1}{2} - \frac{1}{2}(2r-1)^t \\ \frac{1}{2} - \frac{1}{2}(2r-1)^t & \frac{1}{2} + \frac{1}{2}(2r-1)^t \end{bmatrix} \qquad (7)$$

For simplicity, let us assume that at $t = 0$, groups X and Z are such that $\begin{bmatrix} s_0^{sm} & s_0^{im} \end{bmatrix} = \begin{bmatrix} 1 & 0 \end{bmatrix}$. That is, there existed no intermarriages between X and Z at $t = 0$. I can easily make this assumption because the dynamic process of the Markov chain does not depend on the initial values of s_t^{sm} and s_t^{im}. This assumption implies that from equation (7), s_t^{im} is given as follows.

$$s_t^{im} = \tfrac{1}{2} - \tfrac{1}{2}(2r-1)^t \qquad (8)$$

From equations (5) and (8), we can write

[6] Note that another way of expressing equation (6) is $S_t = (s_{t-1}^{sm} \quad s_{t-1}^{im})P$

[7] The proof of this expansion is given in the apendix.

$$\alpha_t = 1 - f(\tfrac{1}{2} - \tfrac{1}{2}(2r-1)^t) \qquad (9)$$

Let α_t and s_t^{im} be linearly related. That is, $\alpha_t = 1 - \gamma s_t^{im}$, where γ is the constant of linearity. To simplify things, let us further suppose that $\gamma = 1$. This means that (9) can be re-written as

$$\alpha_t = \tfrac{1+(2r-1)^t}{2} \qquad (10)$$

Recall from equation (3) that $\pi_t = (2\alpha_t - 1)T$. This means that (3) and (10) can be combined to yield

$$\pi_t = T(2r-1)^t \qquad (11)$$

Now, $\frac{\partial \ln \pi_t}{\partial t} = \ln(2r-1) < 0$, for $\frac{1}{2} \leq r < 1$, implying that π_t as given in (11) decreases over time. Before I go to the next section, let me point out here that from (4), whenever, for instance, X is in power, because of the pursuance of sectarian interest in terms of promoting X's sociocultural or religious values at the expense of Z,utility of x is greater that utility of z by

$$bG_t^x - b(G_t^x - \pi_t) = b\pi_t = bT(2r-1)^t \qquad (12)$$

It is clear from the derivative above that this difference in per-capita utility diminishes over time.

3.2 Political Power Struggle and Resource Allocation

Whenever $\pi_t > 0$, the group in opposition will want to capture political power from the ruling group because π_t is utility reducing to members of the group that is not in power. This means that at the initial stage of the sociopolitical process when π_t may be relatively

large, this struggle for power may take violent forms such as coups, insurrections or wars because of what is at stake in terms of utility lost. This means that, with large π_t at the initial stage, the groups, especially the minority group, may find it attractive to deviate from established rules dictating smooth and democratic transitions and thus employ extralegal means to acquire or hold on to political power in order to enjoy the large π_t. I will return to this point later.

Suppose that to engage in struggle for political power all members of a group contribute the same amount of the endowed resource H. Recall that m_t^i, $i = x, z$ is the portion of H each member of a group allocates towards struggle for political power at time t. I assume that the probability of a successful takeover of political power (or a successful defense of political power) of groups Z and X are respectively given by

$$p_t^z = 1 - p_t^x = \frac{N_t^z m_t^z}{N_t^z m_t^z + N_t^x m_t^x} = \frac{(1+n)^t N_0^z m_t^z}{(1+n)^t N_0^z m_t^z + (1+n)^t N_0^x m_t^x} = \frac{N_0^z m_t^z}{N_0^z m_t^z + N_0^x m_t^x} \tag{13}$$

$$p_t^x = 1 - p_t^z = \frac{N_t^x m_t^x}{N_t^z m_t^z + N_t^x m_t^x} = \frac{(1+n)^t N_0^x m_t^x}{(1+n)^t N_0^z m_t^z + (1+n)^t N_0^x m_t^x} = \frac{N_0^x m_t^x}{N_0^z m_t^z + N_0^x m_t^x} \tag{14}$$

Equations (13) and (14) show that the probability of a successful struggle for power not only depends on a group's military resources, but also on the military resources of the rival group. Also, we can see that the larger the size of a group, the greater the chances of the group acquiring or holding on to political power. Now let $R = \frac{N_t^x}{N_t^z} = \frac{N_0^x}{N_0^z}$. This means that by multiplying both the numerators and the denominators of (13) by R and (14) by $\frac{1}{R}$ we get

$$p_t^z = 1 - p_t^x = \frac{m_t^z}{m_t^z + R m_t^x} \tag{15}$$

$$p_t^x = 1 - p_t^z = \frac{m_t^x}{\frac{1}{R}m_t^z + m_t^x} \qquad (16)$$

In this case where I have assumed that $N_t^x = N_t^z$, $R = \frac{1}{R} = 1$. I will consider the general case where N_t^x may not be equal to N_t^z in section 3.4.

Equilibrium m_t^i and h_t^i

At every t, members of X and Z decide how much of H they want to individually allocate towards the production of y (h_t^i) and how much they want to allocate towards the struggle to either acquire or defend political power in order to enjoy π_t (m_t^i). Remember that at every t, the probability that a group will be in power is p_t^i. This means that at every t, the expected utility of $i = x, z$ is $EU_t^i = p_t^i[aC_t^i + bG_t] + (1 - p_t^i)[aC_t^i + b(G_t - \pi_t)]$. Note that, $G_t^i = G_t$ if group i is in power and $G_t^i = G_t - \pi_t$ if group i is not in power. For this reason, to choose m_t^i and h_t^i, x and z solve the following optimization problem:

$$(A)\ Max \sum_{t=0}^{\infty} \beta^t \left\{ p_t^i[aC_t^i + bG_t] + (1 - p_t^i)[aC_t^i + b(G_t - \pi_t)] \right\} = Max \sum_{t=0}^{\infty} \beta^t \left[aC_t^i + bG_t - p_t^j b\pi_t \right], \quad i \neq j$$

Subject to

$$i)\ \ H = m_t^i + h_t^i \implies m_t^i = H - h_t^i$$
$$ii)\ \ C_t^i = y_t^i - \tau$$
$$iii)\ \ y_t^i = \phi_t h_t^i$$

Where β is the discount factor. The above optimization problem implies that choices made in each period affect only that period's pay-offs. Because of this, optimization problem (A) is a series of single

periods optimization problems. Substituting the constraints (and the expressions for p_t^j and π_t), at every t, x and z solve the following problem choosing h:

$$(B)\quad Max\left\{a(\phi_t h_t^i - \tau) + bG_t - \left[\frac{(H-h_t^j)}{(H-h_t^i)+(H-h_t^j)}\right] bT(2r-1)^t\right\},\ i \neq j$$

The first order conditions for interior solution at every t are

$$x: \quad a\phi_t - \frac{(H-h_t^z)bT(2r-1)^t}{[(H-h_t^z)+(H-h_t^x)]^2} = 0 \qquad (17)$$

$$z: \quad a\phi_t - \frac{(H-h_t^x)bT(2r-1)^t}{[(H-h_t^z)+(H-h_t^x)]^2} = 0 \qquad (18)$$

Solving (17) and (18) simultaneously yields the following solutions:

$$h_t^{z*} = h_t^{x*} = h_t^* = H - \frac{1}{4}\frac{bT}{a\phi_t}(2r-1)^t \qquad (19)$$

$$m_t^{z*} = m_t^{x*} = m_t^* = \frac{1}{4}\frac{bT}{a\phi_t}(2r-1)^t \qquad (20)$$

And substituting (19) into the production function, I derive the dynamic process of output per capita as follows:

$$y_t^{z*} = y_t^{x*} = y_t^* = \phi_t H - \frac{1}{4}\frac{bT}{a}(2r-1)^t \qquad (21)$$

We can see from these results that the intensity of political power struggle as shown by equation (20), and the size of per capita output as shown by equation (21) depend on the size of productive technology (ϕ_t), how socially different the groups are (r), time (t), etc.

Implications and Discussion

To appreciate the above results, let us consider the following implications:

a)

$$ai.\ \ \frac{\partial m_t^*}{\partial t} = \frac{Log(2r-1)(2r-1)^t bT4a\phi_t - 4abT(\frac{d\phi_t}{dt})(2r-1)^t}{16a^2\phi_t} \leq 0$$

$$aii.\ \ \frac{\partial h_t^*}{\partial t} = \frac{-Log(2r-1)(2r-1)^t bT4a\phi_t + 4abT(\frac{d\phi_t}{dt})(2r-1)^t}{16a^2\phi_t} \geq 0$$

$$aiii.\ \ \frac{\partial y_t^*}{\partial t} = H\frac{d\phi_t}{dt} - \frac{bTLog(2r-1)(2r-1)^t}{4a} \geq 0$$

Dividing both sides of $aiii$ by y_t^* yields

$$aiv.\ \ g_{y^*} = g_{y^*}^{\phi} + g_{y^*}^{h}$$

Where g_{y^*} is the total growth rate of per-capita output, $g_{y^*}^{\phi}$ is the part of growth rate of per capita output that is attributable to technological improvement, and $g_{y^*}^{h}$ is the part of growth rate of per capita output that results from social integration and harmonization, which is the result of reallocating economic resources from economically unproductive and wasteful use (political power struggle) to economic and productive use (production). Before we discuss the above equations, let us first consider the following limits.

b)

$$bi.\ \ Lim_{t\to\infty} m_t^* = 0$$

$$bii.\ \ Lim_{t\to\infty} h_t^* = H$$

$$biii.\ \ Lim_{t\to\infty} y_t^* = \phi_t H$$

$$biv.\ \ Lim_{t\to\infty} g_{y^*} = g_{y^*}^{\phi}$$

We can see from implications ai to aii that, given all other factors, the intensity of political power struggle (m_t^*) between groups X and Z diminishes over time. And since political conflicts decreases the amount of resources available for productive use, decrease in the intensity of political struggle for power over time leads to reallocation of

these resources to productive use, thereby increasing h_t^* and thus output per capital. This means that, as shown by implication aiv, growth of per-capita output in this model comes from two sources: technological improvement and growth-enhancing social transformation. For this reason, we expect the long-existing countries in the developed world (remember the definition of 'country' I gave above) to have greater level of output per-capita than the newly independent nation-states, since time has allowed these countries to undergo enough favorable sociopolitical transformation and thus are able to reallocate more and more resources to productive use rather that inefficiently allocating them to political conflicts. Furthermore, since $g_{y^*} = g^{\phi}_{y^*} + g^{h}_{y^*}$, and since in the limits $g_{y^*} = g^{\phi}_{y^*}$, this model predicts that the newly formed nation-states in the developing world should generally have greater rates of growth of output per capita than the long-existing countries in the developed world.

c)

ci. $\frac{\partial m_t^*}{\partial r} = \frac{2tbT(2r-1)^{t-1}}{4a\phi_t} \geq 0$

cii. $\frac{\partial y_t^*}{\partial r} = -\frac{2tbT(2r-1)^{t-1}}{4a} \leq 0$

Implications *ci* and *cii* show that the social distance between the groups in terms of race/ethnicity, religion, language, etc. (r) influences both the intensity of political struggle for power at every t and the rate at which a country grows over time. The more socially different the groups in a country are (thus the bigger the r and thus the smaller the q), the greater the intensity of political power struggle (m_t^*) at every t, and also the slower the rate of growth-enhancing social transformation. This means that even though two countries may be formed at the

same time, other things remaining the same, the country with the less distant social groups will have little political friction (smaller intensity of political power struggle) and thus will be able to grow faster than the country with more socially heterogenous groups. Another point to note here is that at the initial stage, for countries with very distant social groups, political power struggle may take violent forms such as coups, civil and political wars, etc. because of the large nature of π_t. This is made manifest by the fact that with r being so large (or q being so small) m_t^* is very large. Additionally, at the initial stage of the sociopolitical transformational process, efforts to establish democratic regimes in these environments have very little chance of success, since, with the payoff from holding political power so high, the best strategies of the groups may be to deviate from the established rules dictating majority rule. Thus, the groups will take to other means of acquiring and holding on to political power in order to enjoy the large π_t. This means that democratic institutions may not be able to survive at the initial stage when the social groups are so different and thus π_t is so large. That is, sound democratic institutions can begin to thrive as the society undergoes social transformation and π_t diminishes. For this reason, we may argue that as much as democratic and sound political institutions may help consolidate the political development process and thus accelerate economic growth, the institutional development itself is part of the sociopolitical evolutionary process.

Before I talk about the rest of the implications, let me point out that in the extreme case if the assumption that $r, q >> 0$ does not hold, and thus if the probability that the groups will integrate is zero (that is, if $q = 0$ and thus $r = 1$), m_t^* will be very large and will never diminish, if

we hold the other factors constant. This means that the country may permanently be characterized by conflicts and wars with no chance of the country tasting of real economic growth and development. To taste of economic growth and development in this extreme case, the only solution may be to divide the country along the lines of the social groupings, if possible. However, we shall see in the next section that economic development may not be a problem even in the extreme case if one of the two groups is so small in size.

d)

di. $\frac{\partial m_t^*}{\partial T} = \frac{b(2r-1)^t}{4a\phi_t} \geq 0$

dii. $\frac{\partial y_t^*}{\partial T} = -\frac{b(2r-1)^t}{4a} \leq 0$

Another interesting implication is that, as shown by implications *di* and *dii*, the size of the government revenue is positively related to the intensity of political power struggle (m_t^*), and is thus negatively related to the size of output per capita (y_t^*) at every t. The reason for this is that if the government revenue continues to be large, its redistribution continues to create more discontent and anger because of the climate of discrimination and ethnic/racial or religious animosity. That is, large government revenues in socially divided countries create more avenues for continued social and political conflicts thereby distorting the efficient use of economic resources. This helps to explain why in spite of the billions of dollars of financial assistance to many of the newly independent nations in the developing world by the IMF and the World Bank, there continues to be underdevelopment and entrenched poverty in these countries. That is, in the face of socioeconomic discrimination due to social fractionalization and heterogeneity, the presence of large

funds to a government formed by one social group fuels social and political conflicts, and therefore leads to a continued inefficient allocation of economic resources toward struggle for political power, thereby negatively impacting the performance of the economy. This means that, at the bilateral and multilateral levels, the best economic assistance many of the newly independent poor nations can get is not economic aid that ends up in the hands of a government that discriminates or is perceived to discriminate, but it is measures that bring about social cohesion and genuine sociopolitical reforms, since this will induce efficient allocation of domestic resources. Additionally, this relationship explains why many poor nations in the developing world with large deposits of natural resources like oil and gas deposits do very poorly economically. That is, large sums of revenues from these resources to the government stimulates very intensive political power struggle (political conflicts) leading to very large economic inefficiencies and thus very poor economic performance.

e)

ei. $\frac{\partial m_t^*}{\partial \phi_t} = -\frac{bT(2r-1)^t}{4a\phi_t^2} \leq 0$

eii. $\frac{\partial y_t^*}{\partial \phi_t} = H \ \geq 0$

And finally, the level of production technology is negatively related to the amount of resources inefficiently allocated to political power struggle. The explanation for this is that, the greater the level of production technology, the greater the opportunity cost of political conflicts and hence the smaller the intensity of such conflicts. This means that if other factors remain the same, this model predicts that the advancements in production technology in modern times should make the

newly independent nations have relatively shorter time of sociopolitical transformational period, and also relatively smaller intensity of power struggle as compared to the transformational process of the countries in the developed world that were formed a long time ago when production technology was not that advanced.

3.4 The General Case Where $\mathbf{N_t^x}$ May not be Equal to $\mathbf{N_t^z}$

The analysis so far assumes that $N_t^x = N_t^z$. In this section, I relax this restricting assumption. That is, I consider the general case where N_t^x may be different from N_t^z. If N_t^x is different from N_t^z, the idea that, if, for instance, X is in power, the government's per-capita transfers are $G_t^x = \alpha_t T$ and $G_t^z = (1- \alpha_t)T$ will lead to imbalance in the government's budget. However, we can still show this discriminatory per-capita government transfers as follows:

Recall that $\Gamma_t = \tau N_t^x + \tau N_t^z$ is the total tax revenue of the government. Also, recall from $(2.a)$ that government transfer to groups X and Z if X is in power are respectively $N_t^x G_t^x = \alpha_t \Gamma_t$ and $N_t^z G_t^z = (1 - \alpha_t)\Gamma_t$. Now, per-capita lump-sum transfers of $(2.b)$ can be restated as

$$\begin{aligned} G_t^x &= \tfrac{\alpha_t}{N_t^x}\Gamma_t \\ & \qquad (22) \\ G_t^z &= \tfrac{1-\alpha_t}{N_t^z}\Gamma_t \end{aligned}$$

Like before, if the government is formed by group X, then $G_t^x > G_t^z$ as far as the groups discriminate in their own favor regarding the pursuance of each group's sociocultural values. This means that from

(22), the difference in per-capita government transfers of equation (3) is now

$$\pi_t = G_t^x - G_t^z = \frac{\alpha_t}{N_t^x}\Gamma_t - \frac{1-\alpha_t}{N_t^z}\Gamma_t = \frac{\alpha_t(N_t^x+N_t^z)\tau}{N_t^x} - \frac{(1-\alpha_t)(N_t^x+N_t^z)\tau}{N_t^z} \quad (23)$$

Since $N_t^i = (1+n)^t N_0^i$, (23) becomes

$$\pi_t = \frac{\alpha_t(N_0^x+N_0^z)\tau}{N_0^x} - \frac{(1-\alpha_t)(N_0^x+N_0^z)\tau}{N_0^z} = \eta_t^x\Gamma_0 - \eta_t^z\Gamma_0 = (\eta_t^x - \eta_t^z)\Gamma_0 = \psi_t\Gamma_0 \quad (24)$$

Where $\eta_t^x = \frac{\alpha_t}{N_0^x}$, $\eta_t^z = \frac{1-\alpha_t}{N_0^z}$ and $\psi_t = \eta_t^x - \eta_t^z$. Again, as long as the groups discriminate in their own favor, if X is power, $\eta_t^x > \eta_t^z$ and thus $\psi_t > 0$. Like before, π_t (and for that matter ψ_t) measures the degree of discrimination and social disintegration between X and Z.

Like the special case, the social integrative process decreases the size of π_t (and thus ψ_t) over time leading to similar resource allocation decisions as we saw above. However, to make the analysis directly comparable to that of the special case above, and for simplicity, let us assume that if even N_t^x is different from N_t^z, and X is in power as I have assumed, $G_t^x = \alpha_t T$ and $G_t^z = (1-\alpha_t)T$, implying that still $\pi_t = (2\alpha_t - 1)T$. For this reason, let us further assume that the government can solve any negative budgetary imbalance that may arise through external borrowing when N_t^x is different from N_t^z. With these simplifying assumptions, the only difference for the general case is that $R = \frac{N_t^x}{N_t^z} = \frac{N_0^x}{N_0^z}$ may not be equal to 1. That is, with these assumptions, the optimization problem (B), which has the constraints substituted in it becomes

$$x: \quad (C_1) \quad Max\left\{a(\phi_t h_t^x - \tau) + bG_t - \left[\frac{(H-h_t^z)}{(H-h_t^z)+R(H-h_t^x)}\right] bT(2r-1)^t\right\}$$

$$z: \quad (C_2) \quad Max\left\{a(\phi_t h_t^z - \tau) + bG_t - \left[\frac{(H-h_t^x)}{\frac{1}{R}(H-h_t^z)+(H-h_t^x)}\right] bT(2r-1)^t\right\}$$

The first order conditions for interior solutions at every t are:

$$x: \quad a\phi_t - \frac{R(H-h_t^z)bT(2r-1)^t}{[(H-h_t^z)+R(H-h_t^x)]^2} = 0 \qquad (25)$$

$$z: \quad a\phi_t - \frac{\frac{1}{R}(H-h_t^x)bT(2r-1)^t}{\left[\frac{1}{R}(H-h_t^z)+(H-h_t^x)\right]^2} = 0 \qquad (26)$$

Solving (25) and (26) simultaneously, I get

$$h_t^{z*} = h_t^{x*} = h_t^* = H - \left[\frac{R}{(1+R)^2}\right]\frac{bT}{a\phi_t}(2r-1)^t \qquad (27)$$

$$m_t^{z*} = m_t^{x*} = m_t^* = \left[\frac{R}{(1+R)^2}\right]\frac{bT}{a\phi_t}(2r-1)^t \qquad (28)$$

And substituting (27) into the production function, I derive the dynamic process of output per capita in the general case as follows:

$$y_t^{z*} = y_t^{x*} = y_t^* = \phi_t H - \left[\frac{R}{(1+R)^2}\right]\frac{bT}{a}(2r-1)^t \quad (29)$$

It can clearly be seen that the previous results are special cases of the current results. That is, if $R = \frac{N_t^x}{N_t^z} = \frac{N_0^x}{N_0^z} = 1$, $\frac{R}{(1+R)^2} = \frac{1}{4}$ as shown in the previous results. This means that all the implications we discussed above hold true here. However, one important additional implication we can deduce from the results of the general case is that the more equal the population sizes of the groups are, the greater the intensity of political power struggle, and vice versa. This means that social polarization is measured not only in terms of the extent of the social distance between the groups (not only in terms of how big r is or how small q is) but also in terms of how equal the sizes of the groups are. For this reason, if other factors remain the same, the country where, for instance, one group constitutes 55% of the total population and the other group constitutes 45% of the total population will have

more per-capita resources allocated towards political power struggle, and will thus have lower output per capita as compared to another country where the population distribution is, say, 70% for one group and 30% for the other group[8]. $\frac{R}{(1+R)^2} = \left[\frac{\frac{N_t^i}{N_t^j}}{\left(1+\frac{N_t^i}{N_t^j}\right)^2}\right]$ measures the degree of social fractionalization. That is, the greater the $\frac{R}{(1+R)^2}$, the greater the degree of social fractionalization and thus the greater the intensity of inter-group power struggle m_t^*, and vice versa.

This therefore explains my earlier point that if one of the two groups is so small in size comparatively, economic development may not be a problem if even we have the extreme case where $r = 1$ (or $q = 0$), since per-capita resource allocated towards power struggle may be insignificant. The explanation for this is that, if one of the groups is so small in size relative to the other group, the probability that the tiny group acquires and holds onto political power becomes infinitesimal. For this reason, the tiny group does not bother itself allocating much economic resource towards active power struggle. And given this behavior, the large group responds likewise thereby leaving enough resource for productive activities. So to sum it, the relative sizes of the groups determine the degree of social fractionalization, which in turn affects the amount of resources allocated towards political power struggle, and thus the level of economic activities and output per capita.

This measure of social fractionalization $\frac{R}{(1+R)^2}$ is highly related to the "ethnic fractionalization" measure that is commonly used in the

[8]Assuming that the size of the total population is one hundred, the following are examples of the value of $\frac{R}{(1+R)^2}$ and how it changes with the relative sizes of the population of the groups. With this assumption, we already know that if the population sizes are 50 for each group, the value is 0.25. If, however, one group has, say, 75 members and the other group has 25 members, the value is 0.1875. And finally, if one group has 99 members and the other group has only one member, the value is only 0.0099.

empirical literature that studies the relationship between social fragmentation and economic growth and development (see, for instance, Easterly and Levine (1997), Collier (2000), Alesina et al. (2003), Alesina and Ferrara (2005), etc.). The ethnic fractionalization (EF) measure used in this literature is a Herfindahl index defined as $EF = 1 - \sum_i^k s_i^2$, where s_i is the ratio of group i to the total population and k is the number of the ethnic groups. EF is the probability that two individuals selected at random belong to two different ethnic groups. In fact, $\frac{R}{(1+R)^2} = \frac{1}{2}(1 - \sum_i^2 s_i^2)$, which implies that these measures are not any different, except that $\frac{R}{(1+R)^2}$ assumes the existence of only two social groups. At first, the assumption of only two social groups may appear too strict. However, it is not that strict in practice. The reason is that if there are three of more social groups in a country, there becomes coalition formations at the political front. This means that additional social groups may not necessarily add to political tensions. In fact, so many social groups may even reduce political tensions thereby minimizing the negative impact of social fractionalization. This means that, as was recognized by Alesina and Ferrara (2005), the EF tends to overstate the negative effects associated with social fractionalization as the number of the social groups increases. Recognizing this, Posner (2004), in his measure of ethnic fractionalization, took into accounts actual political coalitions. However, the problem with this approach is that political alignments tend to switch around over time and are thus not permanent.

4. Conclusion

We have seen from this model that the social and political environments in which economies operate immeasurably affect economic outcomes. This is because, as we saw from the analyses, social polarization creates political tensions, which brings about unhealthy power struggle, at least at the initial stage of the sociopolitical process leading to inefficient allocation of economic resources towards political power struggle, which results in poor economic performance. However, over time as the society becomes more and more integrated through intergroup marriages, this political tension diminishes, leading to more efficient allocation of resources towards production away from political power struggle thereby improving economic outcome. Through these processes, I have shown that growth rate of per-capita output is generally higher at the initial stage than in the limits. However, fundamental differences in terms of the level of social distance between the groups, the relative sizes of the social groups, etc. affect the rate at which each country can grow and catch up with the already developed world. And, with the exception of the extreme case where the social groups have no chance of integrating (which may lead to the country disintegrating into pieces), economic growth will happen, even though it may happen at slower rate and the catch-up take longer time.

One policy recommendation of this model is that to help a country come out of economic challenges and thus speed up economic growth, we may not merely want to provide financial aid, but we may have to provide measures that will speed up social integration and social harmonization so as to bring about a more efficient use of domestic resources.

It is clear that the model in this paper is silent about economic

processes like physical capital accumulation, human capital accumulation, financial sector development, etc. while these processes may impact economic outcome. For this reason, it may be more interesting to incorporate these processes into the model. However, if the appropriate sociopolitical environments exist, I do not see why these economic processes will differ from one country to another, especially if we assume that employment of these resources exhibit diminishing marginal productivity.

We can deduce from the analysis so far that the main reason why other models that seek to explain cross-country growth differences fail to fully explain the differences in growth rates, especially among countries in the developing world, is that these models implicitly assume that all countries have similar, if not identical, social and political environments. But as we saw in the analyses, countries do differ greatly in terms of sociopolitical environments and their transformational processes.

Let me point out at this point that as my definition of 'country' suggests, the conclusion about long-run economic convergence of countries is conditional on the ability of counties of the world to preserve or even strengthen the existing international political order. If the international political order breaks down and countries start to occupy and colonize others as it used to happen in the past, then the colonized countries' political structure may break down creating new complications socially and politically if even independence is regained.

APPENDIX

I show in this appendix that

$$P^t = \begin{bmatrix} r & 1-r \\ 1-r & r \end{bmatrix}^t = \begin{bmatrix} \frac{1}{2}+\frac{1}{2}(2r-1)^t & \frac{1}{2}-\frac{1}{2}(2r-1)^t \\ \frac{1}{2}-\frac{1}{2}(2r-1)^t & \frac{1}{2}+\frac{1}{2}(2r-1)^t \end{bmatrix}$$

Let us decompose P into matrixes of eigenvalues and eigenvectors as follows. Let $\Lambda = \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix} = \lambda \mathbf{I}$, where λ is eigenvalue (characteristic root) and $\mathbf{I}$ is an identity matrix. Also, let L be the orthogonal matrix of eigenvectors ($\mathbf{l}_1$ and $\mathbf{l}_2$). That is, $L = \begin{bmatrix} \mathbf{l}_1 & \mathbf{l}_2 \end{bmatrix}$. We can then write P as

$$P = L\Lambda L^{-1} \qquad (A1)$$

With this decomposition in $(A1)$, P^t can be expressed as

$$P^t = (L\Lambda L^{-1})^t = L\Lambda^t L^{-1} \qquad (A2)$$

Note that

$$\Lambda^t = \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}^t = \begin{bmatrix} \lambda^t & 0 \\ 0 & \lambda^t \end{bmatrix} \qquad (A3)$$

Now, in the non-trivial case (that is if $\mathbf{l}_1, \mathbf{l}_2 \neq 0$) in $P\mathbf{l} = \lambda \mathbf{I}$, we have

$$\det(P\mathbf{l} = \lambda \mathbf{I}) = \begin{bmatrix} \lambda - r & r-1 \\ r-1 & \lambda - 1 \end{bmatrix} = 0 \quad (A4)$$

That is, from $(A4)$,

$$(\lambda - r)^2 - (r-1)^2 = 0$$

$$\implies \lambda^2 - 2r\lambda + (2r-1) = 0 \qquad (A5)$$

Solving $(A5)$ for the characteristic roots, I get

$$\lambda = \frac{2r \pm \sqrt{4r^2 - 8r + 4}}{2}$$

$$\implies \lambda = 1 \text{ or } \lambda = 2r - 1 \qquad (A6)$$

From $(A6)$ if $\lambda = 1$, we can solve for the elements of $\mathbf{l}_1$ in $P\mathbf{l}_1 = 1\mathbf{l}_1$ as follows:

$$(1 - r)l_{11} = (1 - r)l_{12} \implies l_{11} = l_{12} \qquad (A7)$$

And if $\lambda = 2r - 1$, we can solve for the elements of $\mathbf{l}_2$ in $P\mathbf{l}_2 = (2r - 1)\mathbf{l}_2$ as follows:

$$-l_{22} = l_{21} \qquad (A8)$$

Based on $(A7)$ and $(A8)$, let $l_{11} = l_{12} = 1$, and let $l_{21} = 1$ and $l_{22} = -1$. This means that

$$L = \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}, \quad \Lambda = \begin{bmatrix} 1 & 0 \\ 0 & 2r - 1 \end{bmatrix} \text{ and } L^{-1} = -\tfrac{1}{2} \begin{bmatrix} -1 & -1 \\ -1 & 1 \end{bmatrix}$$

First, let us verify that $P = L\Lambda L^{-1}$ as follows:

$$-\tfrac{1}{2} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 2r - 1 \end{bmatrix} \begin{bmatrix} -1 & -1 \\ -1 & 1 \end{bmatrix} = \tfrac{1}{2} \begin{bmatrix} 1 & 2r - 1 \\ 1 & 1 - 2r \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} = \begin{bmatrix} r & 1 - r \\ 1 - r & r \end{bmatrix} = P$$

And $P^t = (L\Lambda L^{-1})^t = L\Lambda^t L^{-1}$ can be calculated as follows:

$$P^t = \tfrac{1}{2} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & (2r - 1)^t \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} = \begin{bmatrix} \frac{1}{2} + \frac{1}{2}(2r - 1)^t & \frac{1}{2} - \frac{1}{2}(2r - 1)^t \\ \frac{1}{2} - \frac{1}{2}(2r - 1)^t & \frac{1}{2} + \frac{1}{2}(2r - 1)^t \end{bmatrix}$$

■

References

Acemoglu, D., and J., Robinson, "A theory of Political Transitions" *The American Economic Review (2001)*

Alesina, A., and A. Drazen, "Why Are Stabilizations Delayed?" *American Economic Review (1991)*

Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg, "Fractionalization", *Journal of Economic Growth (2003)*

Alesina, A., and E. La Ferrara, "Ethnic Diversity and Economic Performance", *Journal of Economic Literature (2005)*

Alesina, A., and E. Spolaore, "On the Number and Size of Nations" *Quarterly Journal of Economics (1994)*

Alesina. A., R. Baqir, and W. Easterly, "Public Goods and Ethnic Divisions" *The Quarterly Journal of Economics (1999)*

Azariadis, A, and A. Drazen, "Threshold Externalities in Economic Development" *The Quarterly Journal of Economics (1990).*

Barro, R., "Economic Growth in a Cross Section of Countries", *The Quarterly Journal of Economics (1991).*

Baumol, W., "Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show" *The American Economic Review (1986)*

Collier, P., "Ethnicity, Politics and Economic Performance", *Economics and Politics (2000)*

Corneo, G., and O. Jeanne, "On relative Wealth effect and Long-run Growth" *Research in Economics (2001)*

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

Eaton, J., and S. Kortum "International Technology Diffusion: Theory

and Measurement" *International Economic Review (1999)*

Esteban, J., and D. Ray, "On the Measurement of Polarization", *Econometrica (1994)*

Evans, P., "How Fast Do Economies Converge?" *The Review of Economics and Statistics (1997)*

Fearon, J., "Ethnic and Cultural Diversity by Country", *Journal of Economic Growth (2003)*

Fershtman, C., K. Murphy, and Y. Weiss, "Social Status, Education and Growth" *Journal of Political Economy (1996)*

Fershtman, C., and Y. Weiss, "Social Status and Economic Performance: A Survey" *European Economic Review" (1998)*

Furtado, D., "Human Capital and Interethnic Marriage Decisions" *University of Connecticut, Department of Economics Working Paper 2006-3 (2006)*

Grossman, H., "A General Equilibrium Model of Insurrections" *The American Economic Review (1991)*

Howitt, P., "Endogenous Growth and Cross-Country Income Differences" *The American Economic Review (2000).*

Jones, L., and R. Manuelli, "A Convex Model of Equilibrium Growth: Theory and Policy Implications", *The Journal of Political Economy (1990).*

Keefer P., and S. Knack, "Polarization, Politics and Property Rights: Links Between Inequality and Growth" *Public Choice (2002)*

van Long, N., and K. Shimomura, "Relative Wealth, Status-seeking, and Catching up" *Journal of Economic Behavior and Organization (2004)*

Lucas, R., "On the Mechanics of Economic Development" *The Journal of Monetary Economics (1998).*

Lucas, R.„ "Why Doesn't Capital Flow from Rich to Poor Countries"

American Economic Review (May, 1990).

Maddison, A., "A Comparison of Levels of GDP Per Capita in Developed and Developing Countries, 19700-1980", *The Journal of Economic History (1983)*

O'Neill, D., "Education and Income Growth: Implications for Cross-Country Inequality", *The Journal of Political Economy (1995)*

de Palo, D., R. Faini, and A. Venturini, "The Social Assimilation of Immigrants", *C.E.P.R Discussion Papers, CEPR Discussion papers: 5992 (2006)*

Pham, T., "Economic Growth and Status-Seeking through Personal Wealth" *European Journal of Political Economy (2005)*

Posner, D., "Measuring Ethnic Fractionalization in Africa", *American Journal of Political Science" (2004)*

Ramey, G., and V. Ramey, "Cross-Country Evidence on the Link between Volatility and Growth", *The American Economic Review (1995).*

Rauscher, M., "Conspicuous Consumption, Economic Growth, and Taxation" *Journal of Economics (1997)*

Reynolds, L., "The Spread of Economic Growth to the Third World: 1850 – 1980" *Journal of Economic Literature (1983)*

Roemer, J., "Rationalizing Revolutionary Ideology: A Tale of Lenin and the Tsar" *Econometrica (1995)*

Romer, P., "Increasing Returns and Long-Run Growth" *The Journal of Political Economy (1986)*

Romer, P., "Endogenous Technological Change" *The Journal of Political Economy (1990).*

Solow, R., "A Contribution to the Theory of Economic Growth", *The Quarterly Journal of Economics (1956).*

Skaperdas, S., "Cooperation, Conflict, and Power in the Absence of Property Rights" *American Economic Review (1992).*

Smith, A., "The Theory of Moral Sentiments" *(1759). Reprinted, Indianapolis: Liberty Fund (1982)*

Tornell, A., and A. Velasco, "The tragedy of the Commons and Economic Growth: Why Does Capital Flow from Poor to Rich Countries?" *Journal of Political Economy (1992).*

Young, A., "Lessons from the East Asian NICS: A Contrarian View" *The European Economic Review (1994)*

Young, A., "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience" *The Quarterly Journal of Economics (1995).*