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# ABSTRACT

## Decolonization, Property Rights and Language Conflicts

We model political contestation over school language policy, within linguistic communities where weak property rights protection leads to high decentralized expropriation. We show that improvements in governance institutions that facilitate property rights protection might exacerbate such language conflicts, even as they reduce the chances of persisting with educational indigenization, while, paradoxically, increasing the net social benefit from doing so. Our findings offer explanations of why languages and cultures of the colonizers continue to play a dominant role in the educational systems of most post-colonial developing societies, and why early post-independence attempts at cultural-linguistic indigenization were either reversed or slowed down subsequently. The main policy implication of our analysis relates to the connection it establishes between property rights protection and the welfare consequences of educational indigenization: such indigenization may improve social welfare when weak institutions lead to weak property rights protection, but reduce it otherwise.

**JEL Classification:** D72, D74, O20, Z18

**Keywords:** production and expropriation, linguistic communities, language policy, language conflict, linguistic autarchy, linguistic globalization, property rights

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## 1. Introduction

European colonial administrations in the 19th and early 20th centuries developed educational systems in their colonies which typically deployed the colonizer's language as the medium of instruction (especially beyond the primary level), followed syllabi almost entirely derived from those operative in the colonial metropole, and adopted the colonizer's cultural practices (e.g. dress codes and sports rituals). Immediately after attaining independence in the years following World War II, many developing countries adopted indigenization of the educational system as an immediate policy objective. Changing the medium of instruction to a local language was the most important component of the indigenization package proposed. But large-scale changes in the syllabus to incorporate local histories, concerns and knowledge traditions, and cultural indigenization of the pedagogic process, were both deemed important as well. The basic instrumental justification offered for such indigenization was its putative contribution to the spread of education among the masses, as opposed to the small elites among whom education had been concentrated under colonialism. In practice, however, indigenization of was often implemented only quite partially, especially beyond the primary level. Furthermore, in the decades following independence, there was a significant roll-back of indigenization efforts in many countries, even as the issue maintained its political salience and domestic political divisions persisted over the questions of the medium of instruction, course content and cultural practices to be adopted within the national educational system.[1] Why did this happen? How was the process affected by the development and strengthening of governance institutions within developing countries that improved the extent of property rights protection? What were the consequences for social welfare? This paper offers a simple theoretical framework that sheds suggestive analytical light on these questions.

It is evident that adopting a global language introduced by European colonial rule (such as English or French) and its associated cultural, behavioural and expressive conventions has the potential to generate social benefits, by facilitating economic interaction with the external world beyond the confines of the immediate language community, thereby expanding the size of the market and permitting the achievement of productivity gains through specialization and economies of scale.[2] The smaller the immediate language community, the larger these productivity gains relative to a status quo involving linguistic autarchy. At the same time, such language shift imposes adjustment costs, both psychic and material, on the adjusting community, which can be significant for at least some sections. To the extent that individual differences exist in the ability to adapt to and function within alien ethno-linguistic norms and associated behavioural patterns, linguistic-communicative globalization is likely

[1] For detailed discussions and country case studies, see Kamwangamalu (2016), Wright (2016, chap. 4), and Lin and Martin (2005).

[2] That individual benefits of acquiring a language is larger, the larger the pre-existing pool of users of that language, is highlighted by Selten and Pool (1991), Church and King (1993) and Lazear (1999).

to increase earnings/welfare differentiation within the globalizing community, generating both winners and losers. Furthermore, some sub-groups may have had early and long-standing historical exposure to global languages and cultural conventions under colonialism; the collective social capital thereby acquired may make it easier for individuals from these (typically elite) sub-groups to adapt and prosper under linguistic globalization.[3] When compensation is imperfect due to information constraints and inability to pre-commit to binding contracts, language policy is therefore likely to generate both winners and losers. Since there are society-wide spill-over effects of individual language choice, language policy thus comes to constitute a site for social conflict between these two groups. The nature of individual gains and losses from adoption of a global language is however also likely to depend crucially on an individual's ability to claim the consequences of her productive effort, i.e., on the strength of property rights protection, broadly interpreted, that she enjoys. Thus, changes in the strength of property rights protection may intuitively be expected to affect language conflict by altering individual incentives, in ways that remain to be formally clarified. Weak institutions typically lead to weak property rights protection and high levels of decentralized expropriation and rent-seeking in post-colonial developing societies. How would an improvement in institutional quality that improves property rights protection affect language politics and, thereby, language policy in these societies?

Despite the emergence of a formal literature on the economics of language in recent years[4], the analytical literature in political economics on language policy as a site of political contestation remains thin. Ortega and Tangerås (2008) develop a political-economic analysis of the imposition of mono-lingual education by dominant groups. Dasgupta (2017) examines how language policy may impact conflict between different ethnic groups along religious or racial dimensions. The problem that we highlight, namely conflict over education policy within the *same* language group, does not figure in either of these contributions. Our paper seeks to address this gap in the literature. To the best of our knowledge, the contribution closest in intuitive family resemblance to our analysis is by Austen-Smith and Fryer (2005), who model conflicts within the African-American community over 'acting White'. However, the specific institutional focus of their investigation, and their modelling strategy, are both very different from those adopted in this paper. In particular, consequences of changes in property rights protection, which form the core of our analysis, do not figure in their analysis at all.

We model a society consisting of a single linguistic community, where conflict arises over attempts by a section of the community to impose a different, global, language on the entire community, from a status quo of linguistic indigenization, where individuals use (only) their own language. We model a two-stage process where, in the first stage, the state's language policy comes about as the

[3] Upper caste Hindu Bengalis in India and Bangladesh, Maronite Christians in Lebanon and Coptic Christians in Egypt constitute standard examples.

[4] See Ginsburgh and Weber (2016) for an overview.

probabilistic consequence of a process of Tullock (1980) contestation between the two groups. We interpret this in terms of a proposal to change the medium of instruction in the entire educational system in the society from the community's own language to some other, global, language, along with the imposition of the associated (alien) cultural, behavioural and expressive conventions on the population via that system.[5] In the second stage, all individuals take the language policy and the degree of property rights protection (the proportion of one's output that a producer can retain) as given, and decide whether to produce or expropriate. The proportion of the population engaged in production is thus endogenous in our model. Individuals have identical productivity in the linguistic status quo, which increases with the size of the population, interpreted as a proxy for the size of the market limited by a shared language. However, their productivities vary according to an exponential distribution under linguistic globalization, which exhibits society-wide increasing returns from adoption of the global language. This formulation incorporates two intuitive ideas. First, even as the adoption of a global language and common cultural conventions opens up new productive opportunities by expanding the size of the market, individuals vary in terms of their ability to take advantage of such opportunities.[6] Second, a more widespread adoption of alien linguistic-cultural conventions has a positive productivity spill-over on the entire society by facilitating productive functioning for all. The second feature makes it individually rational for every individual not to attempt a unilateral acquisition of the global language in the status quo, so that language acquisition becomes a matter of collective political action. Under our assumption of a relatively large community, linguistic globalization increases the productivity of a section of the population while simultaneously reducing that of the remainder. We show that, when the linguistic community is relatively large, or property rights protection weak, linguistic globalization reduces aggregate social output, compared to the status quo situation of linguistic indigenization (or autarchy). The proportion of the population engaged in production falls as well. However, the earnings of a section of the population increase. Consequently, in the first period, the winning and losing groups engage in Tullock (1980) contestation over language policy, i.e. the probability of linguistic globalization, so as to maximize their respective expected group incomes in the second period.

We find that stronger property rights protection makes linguistic globalization more likely. However, marginal improvements in property rights protection from a low initial level increase the

[5] This can involve matters such as dress codes (Western clothing rather than traditional ethnic wear), desegregation of genders, inculcation of different norms of health, hygiene and dietary appropriateness, greater exposure to Western cultural traditions and a corresponding reduction of emphasis on indigenous elements, etc. The overhaul and Westernization of the Turkish educational system under Mustafa Kemal Atatürk and that of the Iranian educational system under Reza Shah Pahlavi constitute examples.

[6] This involves an intuitive elaboration of the idea of idiosyncratic language learning costs deployed by Gabszewicz *et al.* (2011) to include idiosyncratic differences in the ability to function efficiently in an alien linguistic-cultural environment. Armstrong (2015) and Dasgupta (2017) also build in this idea in their models of language learning. For a recent review of empirical evidence on the positive impact of a common language on international trade, see Egger and Toubal (2016).

aggregate social loss from such a policy choice, relative to the autarchic status quo. Thus, marginal improvements in property rights protection from a low initial level have the perverse consequence of increasing both the chances of the society adopting an inefficient language policy, viz. linguistic globalization, and the net social cost of doing so. Such improvements also increase conflict over language policy. Beyond a threshold, the larger the linguistic community, the lower the probability of linguistic globalization, but the greater the social waste due to linguistic conflict.

Our findings explain why languages and cultures of the colonizers continue to play a large, often pre-eminent, role in the educational systems of most post-colonial developing societies, and why early post-independence attempts at cultural-linguistic indigenization of these systems were typically either reversed or slowed down subsequently. They also explain the continuing salience of cultural-linguistic indigenization as an item of political contestation in developing societies, by highlighting its redistributive role. Furthermore, they highlight the contradictory impact of cultural-linguistic indigenization of the education system on aggregate social welfare: such indigenization may increase the latter when weak institutions lead to weak property rights protection, but reduce it otherwise. They also draw attention to the contradictory consequences of improvements in institutional quality that strengthen property rights. Such improvements may initially have the perverse effect of increasing both the chances of inefficient language policy choice and the social cost of such inefficient policy choice; in addition to entailing greater social conflict over language policy.

Section 2 sets up the model and discusses our key results. Section 3 concludes.

## 2. The model

Consider a society consisting of a linguistic community N, with population size $n \geq 1$. Each member of N acquires that community's language costlessly, through childhood socialization. In the status quo, all members of N are capable of only the language acquired at birth. We call the status quo linguistic autarchy. The government can impose either a global language, M, on the society, via the school system as the medium of instruction, or permit the indefinite perpetuation of linguistic autarchy. We term the former policy option linguistic globalization, or globalization for convenience. Globalization implies that all economic (productive) interaction must be carried out solely via the global language, M.

In the first period, the language policy of the government is determined as the outcome of a process of political contestation. Subsequently, individuals take the language policy as given and act atomistically to maximize their individual incomes.

### 2.1. Language, production and expropriation

We first model the outcomes in the second period. Each individual is endowed with one unit of labour which she can use either for production or expropriation. Producers can retain some proportion of their output, $\gamma \in (0,1)$, reflecting the strength of property rights protection in the society, while the remaining portion is expropriated by non-producers. Each individual has to decide whether to produce or engage in expropriation; entry into either sector is costless. Individuals can only engage in economic interaction with other individuals who share a common language. Thus, under linguistic autarchy, members of N can only engage in economic interaction with members of their own linguistic community. The marginal product of an individual is then simply $kn$, where $k > 0$ is an economy-wide productivity parameter. This captures the idea that the benefit of acquiring a language increases with the number of its speakers (Selten and Pool (1991) and Church and King (1993)), say due to the consequent increase in the market size generating productivity gains through greater scope for specialization and division of labour. Total output under autarchy is therefore given by:

$$Y_T = kn^2\theta_T; \tag{1}$$

where $\theta_T \in (0,1)$ is the proportion of the population engaged in production. Since, in equilibrium, returns must be identical across activities, the equilibrium proportion of the population engaged in production under linguistic autarchy is given by:

$$\frac{(1-\gamma)kn^2\theta_T}{n(1-\theta_T)} = kn\gamma,$$

so that:

$$\theta_T = \gamma. \tag{2}$$

Thus, under autarchy, equilibrium output is given by:

$$Y_T = kn^2\gamma, \tag{3}$$

with individual income:

$$y_T = kn\gamma. \tag{4}$$

Under linguistic globalization, conditional on $\theta_G$ proportion of the society producing, individuals can be ranked, in decreasing order of productivity, according to a (conditional) individual productivity function $\mathcal{R}_{\theta_G}(z_G) = [k\alpha {z_G}^{\alpha-1}]\theta_G$, with $\alpha \in (0,1)$ and $z_G \in [0,1]$. Thus, conditional on $\theta_G$ proportion of the society being economically active when the state imposes the global language M as a precondition for production, $z_G$ proportion of the society will have individual productivity not less than $[k\alpha {z_G}^{\alpha-1}]\theta_G$, while the remaining proportion $(1 - z_G)$ will consist of individuals with

productivity less than $[k\alpha {z_G}^{\alpha-1}]\theta_G$. If $\theta_G$ proportion of the society produces, then individual rationality requires that this be the most productive $\theta_G$ proportion. Hence the productivity of the marginal (i.e., the lowest productivity) individual *within* the producing class is given by $\mathcal{R}_{\theta_G}(\theta_G) = [k\alpha {\theta_G}^{\alpha-1}]\theta_G$. Total output of the community is therefore:

$$Y_G = k\alpha n\theta_G \int_0^{\theta_G} [{z_G}^{\alpha-1}]dz_G = kn{\theta_G}^{\alpha+1}. \tag{5}$$

Equation (5) implies that, given the level of economic participation $\theta_G < 1$, a rise in $\alpha$ depresses total output. Since $\frac{\partial[\alpha {z_G}^{\alpha-1}]}{\partial\alpha} = \alpha {z_G}^{\alpha-1}[\frac{1}{\alpha} + \ln z_G]$, this implies that higher $\alpha$ depresses the productivity of high productivity individuals (the top $\frac{1}{e^{\frac{1}{\alpha}}}$ proportion of the income distribution), but increases that of low productivity individuals. Thus, higher $\alpha$ implies a reduced *dispersion* of individual productivity under globalization, and hence lower inequality in the ability of N individuals to adopt the global language. Notice that, by construction, a positive proportion of the population will produce more under globalization than under autarchy, so long as the level economic participation remains positive. The lowest possible individual output, when the entire society globalizes and engages in production, is $k\alpha$, whereas all individuals produce $kn$ under linguistic autarchy. Since by assumption $\alpha \in (0,1)$ and $n \geq 1$, we have $\frac{\alpha}{n} < 1$. Thus, globalization will be output-reducing for a positive proportion of society.

Our formulation incorporates two different features. First, individuals differ in terms of their ability to function productively within an alien linguistic-cultural tradition (e.g. Armstrong (2015) and Dasgupta (2017)). While some find great scope for more remunerative deployment of their effort in the expanded market that linguistic globalization offers, others are less able to take advantage of such opportunities due to their inherent difficulty in adjusting to an alien linguistic-cultural communicative environment. Thus, globalization opens up inequality within the globalizing society solely due to differential language learning and cultural adaptation abilities, and consequently differential ability to function productively an alien linguistic-cultural environment. Second, there exist community-level increasing returns to scale to productive participation in linguistic-cultural globalization. If a larger proportion of the community engages in economic activities mediated by global linguistic-cultural conventions, then each community member's productivity subsequent to globalization rises, due to positive externalities and spill-over effects within the community. This happens because the difficulty of economic functioning in an alien linguistic-cultural environment is lowered if a larger proportion of one's fellow community members are already so functional in that environment.

Recalling (5), given any level of engagement in production under globalization, $\theta_G$, return from expropriation under globalization for the marginal individual, net of her return from production, is:

$$r = \frac{k{\theta_G}^{\alpha+1}(1-\gamma)}{1-\theta_G} - k\alpha\gamma{\theta_G}^{\alpha} = k{\theta_G}^{\alpha}(1-\gamma)[\frac{\theta_G}{1-\theta_G} - \frac{\alpha\gamma}{(1-\gamma)}]. \tag{6}$$

Then a unique equilibrium exists, given by: $\frac{\theta_G}{1-\theta_G} = \frac{\alpha\gamma}{(1-\gamma)}$, so that:

$$\theta_G = [\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}]. \tag{7}$$

Clearly, the equilibrium is also stable. Notice that, by (7), $\theta_G < \gamma$ since $\alpha < 1$. Recalling (2) and (7), we thus have the following.

**Remark 1.** Linguistic globalization reduces the proportion of the productive population, commensurately increasing the proportion of the population engaged in expropriation, relative to the case under linguistic autarchy. The proportion of the population producing in equilibrium under globalization is increasing in $\alpha, \gamma$.

Using (5) and (7), total output under linguistic globalization is:

$$Y_G = kn{\theta_G}^{\alpha+1} = kn[\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}]^{\alpha+1}. \tag{8}$$

Using (3) and (8), output gap, i.e. total output under globalization net of output under autarchy, is:

$$\Delta Y_G \equiv Y_G - Y_T = kn^2\gamma\left[\left(\frac{1}{n\gamma}\right)(\theta_G)^{\alpha+1} - 1\right] = kn^2\gamma[\frac{\alpha}{n(1-\gamma(1-\alpha))}\left(\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}\right)^{\alpha} - 1]. \tag{9}$$

The properties of the output gap $\Delta Y_G$ are specified in Proposition 1 below.

**Proposition 1.** (i) $\lim_{\gamma\to 0}\Delta Y_G = 0$, $\lim_{\gamma\to 1}\Delta Y_G \leq 0$; (ii) for all $\gamma \in (0,1)$, $\Delta Y_G < 0$, (iii) if $\left[n \geq \left(1+\frac{1}{\alpha}\right)\right]$ then $\frac{\partial \Delta Y_G}{\partial \gamma} < 0$ for all $\gamma \in (0,1)$, and (iv) $\frac{\partial \Delta Y_G}{\partial k}, \frac{\partial \Delta Y_G}{\partial n} < 0$ for all $\gamma \in (0,1)$.

**Proof of Proposition 1.** Recalling that $n \geq 1$, part (i) of Proposition 1 follows immediately from (9). Now consider the term $Z \equiv \frac{\alpha}{(1-\gamma(1-\alpha))}\left[\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}\right]^{\alpha}$. Then, from (9),

$$\frac{\partial \Delta Y_G}{\partial \gamma} = \frac{\Delta Y_G}{\gamma} + kn\gamma\frac{\partial Z}{\partial \gamma}. \tag{10}$$

Now,

$$\ln Z = \ln\alpha + \alpha\ln\alpha\gamma - (\alpha+1)\ln(1-\gamma(1-\alpha)),$$

so that:

$$\frac{\partial Z}{\partial \gamma} = \frac{Z(\alpha+(1-\alpha)\gamma)}{\gamma(1-\gamma(1-\alpha))} > 0. \tag{11}$$

Recall that, by (9), $\frac{\Delta Y_G}{\gamma} = kn^2[\frac{Z}{n} - 1]$. Thus, using (10) and (11),

$$\frac{\partial \Delta Y_G}{kn\partial \gamma} = Z[1 + \frac{(\alpha+(1-\alpha)\gamma)}{(1-\gamma(1-\alpha))}] - n. \tag{12}$$

Equation (12) implies that $\lim_{\gamma \to 0} \frac{\partial \Delta Y_G}{\partial \gamma} = -n < 0$, Clearly, $\frac{\partial^2 \Delta Y_G}{\partial \gamma^2} > 0$. Part (ii) of Proposition 1 then follows from part (i). Now notice that $\lim_{\gamma \to 1} \frac{\partial \Delta Y_G}{\partial \gamma} = \left(1 + \frac{1}{\alpha}\right) - n$. Recalling that $\lim_{\gamma \to 0} \frac{\partial \Delta Y_G}{\partial \gamma} = -n < 0$ and $\frac{\partial^2 \Delta Y_G}{\partial \gamma^2} > 0$, part (iii) of Proposition 1 follows. Part (iv) follows immediately from (9) in light of Proposition 1(ii). ■

By Proposition 1, linguistic globalization makes the globalizing society as a whole worse off. Thus, linguistic globalization is inefficient in a socially aggregative sense under our assumptions. Provided the linguistic community is sufficiently large, an improvement in property rights protection within the community makes linguistic autarchy more attractive, relative to globalization, to the society as a whole. Improvements in society-wide productivity levels and population increases have the same effect.

Figure 1 illustrates the behaviour of net output with changes in the extent of property rights protection, as summarized in Proposition 1.

**Insert Figure 1 here.**

**Remark 2.** It can be checked that, if the linguistic community is relatively small, in the sense that $\left[n < \left(1 + \frac{1}{\alpha}\right)\right]$, then there must exist $\hat{\gamma} \in (0,1)$ such that $\frac{\partial \Delta Y_G}{\partial \gamma} < 0$ for all $\gamma \in (0, \hat{\gamma})$. Thus, a marginal improvement in property rights protection from an initial low level will continue to increase the aggregate social output from linguistic autarchy relative to linguistic globalization, as in Proposition 1(iii). However, at already high levels of such protection, further improvements will reduce the net aggregate social benefit from linguistic autarchy for relatively small linguistic communities. Net aggregate output must however continue to be higher under autarchy, compared to globalization, for any $\gamma \in (0,1)$ if (as assumed in our benchmark model) $n \geq 1$. If, in consonance with our maintained assumption $\frac{\alpha}{n} < 1$, we have $n \in (\alpha, 1)$, linguistic globalization will be socially beneficial, relative to autarchy, when property rights are sufficiently well protected. This case is depicted in Figure 2 below.

**Insert Figure 2 here.**

Recall now that the lowest return received by an individual under linguistic-cultural globalization, net of her return under linguistic autarchy must be negative, under our maintained assumption $\alpha < n$. Thus, a positive proportion of the population must lose out from a shift to globalization. The income of the individual who receives identical amounts under globalization and autarchy must satisfy:

$$\left[k\alpha\tilde{\theta}_G{}^{\alpha-1}\right]\theta_G\gamma = kn\gamma. \tag{13}$$

From (13) we get the proportion of the population which gains from globalization:

$$\tilde{\theta}_G = \left(\left[\frac{\alpha}{n}\right]\theta_G\right)^{\frac{1}{1-\alpha}}. \tag{14}$$

Notice that, since $\frac{\alpha}{n} < 1$, and $\alpha \in (0,1)$, (14) implies $\tilde{\theta}_G < \theta_G$. Hence, the group of all individuals who would engage in expropriation under linguistic globalization (of population proportion $(1-\theta_G)$), and a sub-section of those who produce under linguistic globalization (of population proportion $\left(\theta_G - \tilde{\theta}_G\right)$, will together constitute the part of the society that would be made worse off by linguistic globalization. We shall term this losing group $\underline{N}$. Conversely, a sub-section of those who produce (of population proportion $\tilde{\theta}_G$) would be made better off. We shall term the gainer group $\overline{N}$.

The findings discussed above are illustrated for expository convenience in Figure 3 below, and, recalling Remark 1, (7) and (14), are summarized as follows.

**Remark 3.** Linguistic-cultural globalization increases the proportion of the population engaged in expropriation, relative to autarchy. All those who engage in in expropriation, and a section of those who engage in production, under such globalization constitute the sub-group ($\underline{N}$), all members of which would be better off under linguistic autarchy. The larger the population size ($n$), the smaller the population share of the sub-group of individuals who stand to benefit from such globalization ($\overline{N}$). The stronger the level of property rights protection (the higher the value of $\gamma$), the larger the population share of this sub-group $\overline{N}$.

Using (14), the income gain from linguistic globalization by the gainer group $\overline{N}$ relative to autarchy (represented by the vertically shaded area in Figure 3 below) is:

$$\Delta\overline{Y}_G = kn\gamma\tilde{\theta}_G\left[\frac{\theta_G}{\tilde{\theta}_G{}^{1-\alpha}} - n\right] = kn^2\gamma\left[\frac{1-\alpha}{\alpha}\right]\left(\left[\frac{\alpha}{n}\right]\theta_G\right)^{\frac{1}{1-\alpha}} = kn^{\left(\frac{1-2\alpha}{1-\alpha}\right)}\gamma(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}}(\theta_G)^{\frac{1}{1-\alpha}} > 0. \tag{15}$$

Income gain from linguistic globalization for the loser group $\underline{N}$ relative to autarchy (represented in absolute terms by the horizontally shaded area in Figure 3) is, recalling (9) accordingly:

$$\Delta \underline{Y}_G = \Delta Y_G - \Delta \overline{Y}_G = kn^2\gamma[\left(\frac{1}{n\gamma}\right)(\theta_G)^{\alpha+1} - (\theta_G)^{\frac{1}{1-\alpha}}\left(\frac{\alpha}{n}\right)^{\frac{1}{1-\alpha}}\left(\frac{1-\alpha}{\alpha}\right) - 1]$$

$$= kn^2\gamma[\frac{1}{n\gamma}\left(\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}\right)^{\alpha+1} - \left[\frac{\alpha\gamma}{(1-\gamma(1-\alpha))}\right]^{\frac{1}{1-\alpha}}\left(\frac{\alpha}{n}\right)^{\frac{1}{1-\alpha}}\left(\frac{1-\alpha}{\alpha}\right) - 1] < 0. \quad (16)$$

**Insert Figure 3 here.**

### 2.2. Political determination of language policy

If costless compensatory transfers were feasible, which fully compensated all losing members of the community, maintaining the status quo situation of linguistic autarchy would be Pareto-improving. Suppose however that compensation is not feasible, due to say difficulties with assessing losses and problems with making binding commitments. Then language policy becomes a site of political contestation between the gainers and the losers. We now proceed to model such conflict in the first period. Let P be the probability of a policy shift to linguistic globalisation from an autarchic status quo:

$$P = \frac{\overline{x}}{\overline{x}+\underline{x}} \text{ if } x \equiv \overline{x} + \underline{x} > 0$$

$$= \frac{1}{2} \text{ otherwise;} \quad (17)$$

where $\overline{x}$ is the conflict/political expenditure by the gainer group $\overline{N}$, $\underline{x}$ is that by the loser group $\underline{N}$, and $x \equiv \overline{x} + \underline{x}$ is the total conflict expenditure in society. Such conflict (or political) expenditure involves the use of real resources in activities such lobbying the government, bribery, and direct action, including the possible use of violence. In standard fashion, we shall identity the intensity of linguistic conflict with the total expenditure incurred on such conflict ($x$). We shall assume that the two groups coordinate their actions within each group. Thus, in effect, there are two players in the first period conflict over language policy, who choose their conflict expenditures simultaneously. Each group is modelled as a risk neutral expected utility maximizer. The pay-off to the $\overline{N}$ group is therefore $[P\Delta\overline{Y}_G + \overline{Y}_T - \overline{x}]$, while the pay-off to the $\underline{N}$ group is $[P\Delta\underline{Y}_G + \underline{Y}_T - \underline{x}]$. Recall that linguistic globalization is inefficient in a socially aggregative sense for our case of a relatively large linguistic community (Proposition 1(ii)). How does an improvement in property rights protection affect linguistic conflict and the probability of linguistic globalization?

**Proposition 2.** (i) $P$ is increasing in $\gamma$ and decreasing in $n$; (ii) if $\left[n \geq \left(1+\frac{1}{\alpha}\right)\right]$ then $x$ is increasing in $\gamma$; and (iii) if $\left[\alpha \leq \frac{1}{2}\right]$, then $x$ is increasing in $n$.

**Proof of Proposition 2.** The FOC for the coalition of losers, $\underline{N}$ is:

$$\left[\frac{-\overline{x}}{(\overline{x}+\underline{x})^2}\right][\Delta \underline{Y}_G] = 1. \tag{18}$$

The FOC for the coalition of winners, $\overline{N}$ is:

$$\left[\frac{\underline{x}}{(\overline{x}+\underline{x})^2}\right][\Delta \overline{Y}_G] = 1. \tag{19}$$

Thus,

$$\frac{\underline{x}}{\overline{x}} = \frac{-\Delta \underline{Y}_G}{\Delta \overline{Y}_G} = \frac{-\Delta Y_G}{\Delta \overline{Y}_G} + 1. \tag{20}$$

Using (9) and (15), $\frac{-\Delta Y_G}{\Delta \overline{Y}_G} = \frac{n^{\left(\frac{\alpha}{1-\alpha}\right)}\left[n-\frac{(\theta_G)^{1+\alpha}}{\gamma}\right]}{(\theta_G)^{\frac{1}{1-\alpha}}(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}}}$. By (7), $\frac{(\theta_G)^{1+\alpha}}{\gamma} = [\frac{\alpha^{1+\alpha}\gamma^{\alpha}}{(1-\gamma(1-\alpha))^{1+\alpha}}]$, which is increasing in $\gamma$. Recalling (7), it follows that $\frac{-\Delta Y_G}{\Delta \overline{Y}_G}$ is decreasing in $\gamma$. Hence $\frac{\underline{x}}{\overline{x}}$ is decreasing in $\gamma$, implying $P$ is increasing in $\gamma$. Furthermore, (7) implies that $\frac{-\Delta Y_G}{\Delta \overline{Y}_G}$ is increasing in $n$, implying $P$ is decreasing in $n$.

(ii) Recall that, from (18)-(19),

$$\frac{-\Delta \underline{Y}_G}{x} = [\frac{-\Delta Y_G}{\Delta \overline{Y}_G} + 1].$$

Since, from part (i), $\frac{-\Delta \underline{Y}_G}{\Delta \overline{Y}_G}$ is decreasing in $\gamma$, $\frac{x}{-\Delta \underline{Y}_G}$ is increasing in $\gamma$. Now $\frac{\Delta \overline{Y}_G}{-\Delta Y_G}$ is increasing in $\gamma$. Hence, $\frac{-\Delta \underline{Y}_G}{-\Delta Y_G} = \left[\frac{\Delta \overline{Y}_G}{-\Delta Y_G} + 1\right]$ is increasing in $\gamma$. It follows that $\frac{x}{-\Delta Y_G}$ is increasing in $\gamma$. Recall now that, by Proposition 1(iii), $\frac{\partial \Delta Y_G}{\partial \gamma} < 0$ if $\left[n \geq \left(1+\frac{1}{\alpha}\right)\right]$, and by Lemma 1(ii), $\Delta Y_G < 0$. It follows that $x$ is increasing in $\gamma$ if $\left[n \geq \left(1+\frac{1}{\alpha}\right)\right]$.

(iii) Let $D \equiv \frac{-\Delta \underline{Y}_G}{\Delta \overline{Y}_G}$. Then, from (20), $\underline{x} = D\overline{x}$, so that $P = \frac{1}{1+D}$. Then, from (19), $x = (\frac{D}{1+D})[\Delta \overline{Y}_G]$. By (7) and (15), $\Delta \overline{Y}_G$ is non-decreasing in $n$ if $\alpha \leq \frac{1}{2}$. Together, (7), (9) and (15) imply that $D$ is increasing in $n$. Proposition 2(iii) follows. ■

Proposition 2(i) implies that better property rights protection increases the chances of the society adopting an inefficient language policy, i.e. linguistic globalization (recall Proposition 1(ii)). Intuitively, this happens because better property rights protection increases the gains of the winning group from linguistic globalization proportionately more than it increases the losses of the losing group. Political expenditure by the former consequently increases proportionately more than that by the latter. Recall that, when the linguistic community is sufficiently large, the net social cost of getting stuck in such an inefficient language policy regime rises with improved property rights protection (Proposition 1(iii)). Better property rights protection increases the winning group's gains from linguistic globalization, but the losing group suffers an even greater loss, so that net social loss from such globalization increases in consequence. It turns out that improved property rights protection also increases the extent of conflict over language policy, measured by the total resource wasted on such conflict in the first period, in this case (Proposition 2(ii)). The larger the population size, the smaller the population share of the sub-group which benefits from linguistic globalization (recall Remark 3), and the lower its gains, while the larger the relative size and the losses of the losing sub-group from such globalization. Hence the larger the population size, the lower the relative political investment by the former to influence policy in order to bring about globalization. Consequently, the larger the linguistic community, the lower the probability of linguistic globalization (Proposition 2(i)), and, given sufficiently high dispersion in the ability of N individuals to adopt the global language, the greater the extent of linguistic conflict (Proposition 2(iii)).

**Remark 4.** It can be shown that, if the linguistic community is relatively small, in the sense that $\left[n < \left(1 + \frac{1}{\alpha}\right)\right]$, then there must exist $\hat{\gamma} \in (0,1)$ such that aggregate linguistic conflict will increase with better property rights protection over $(0, \hat{\gamma})$. Thus, a marginal improvement in property rights protection from a low initial level will continue to exacerbate conflict over language policy and increase the net social cost due to linguistic globalization (recall Remark 2 and Figure 2). However, at already high levels of property rights protection, further improvements may reduce such conflicts when the linguistic community is relatively small.

## 3. Concluding remarks

In this paper, we have developed a simple model of within-group conflict over language policy that yields insights regarding the relationship between the likelihood of a linguistic community replacing its own language by a global language and conflict surrounding such replacement on the one hand, and the strength of property rights protection on the other. Our key findings relate to the possibility of an improvement in property rights protection making linguistic globalization more likely, even as marginal improvements in property rights protection from a low initial level increase the aggregate social loss

from such a policy choice, relative to the autarchic status quo. Such improvements may also increase conflict over language policy. Our findings provide one possible rationalization of why languages and cultures of the colonizers continue to play a dominant, even expanding, role in the educational systems of most post-colonial developing societies, and why early post-independence attempts at cultural-linguistic indigenization of these systems were typically either reversed or slowed down subsequently. They also explain the continuing salience of cultural-linguistic indigenization as an item of political contestation in developing societies, by clarifying its redistributive role. The main policy implication of our analysis relates to the connection it establishes between property rights protection and the welfare consequences of educational indigenization: such indigenization may improve social welfare when weak institutions lead to weak property rights protection, but reduce it otherwise.

By focusing on a single linguistic community, we have abstracted from the possibility that a global language may be chosen as a conflict-reducing compromise in countries comprised of multiple language communities. How within-community language conflicts of the kind we have highlighted in this paper interact with and condition between-community language conflicts is an interesting question that may be fruitfully analysed in a more expansive formal model than the one we have attempted here. Second, the broad general structure of our model may also be applied to investigate other kinds of policy changes that generate both winners and losers within a community, such as trade liberalization and labour market deregulation. We look forward to these extensions and applications in future work.

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**Figure 1: Output from globalization net of output under autarchy if $\left[\boldsymbol{n} \geq \left(\mathbf{1} + \frac{\mathbf{1}}{\boldsymbol{\alpha}}\right)\right]$**

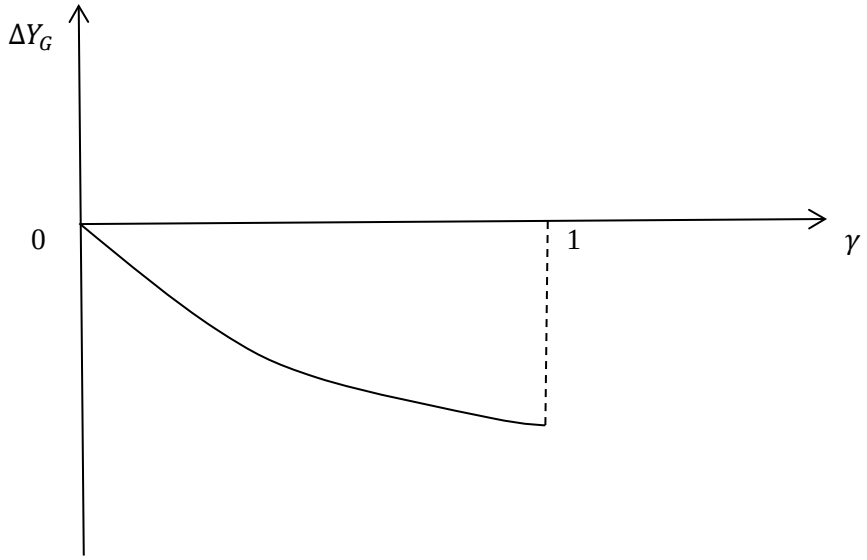


**Figure 2 Output from globalization net of output under autarchy if $\boldsymbol{n} \in (\boldsymbol{\alpha}, \mathbf{1})$.**

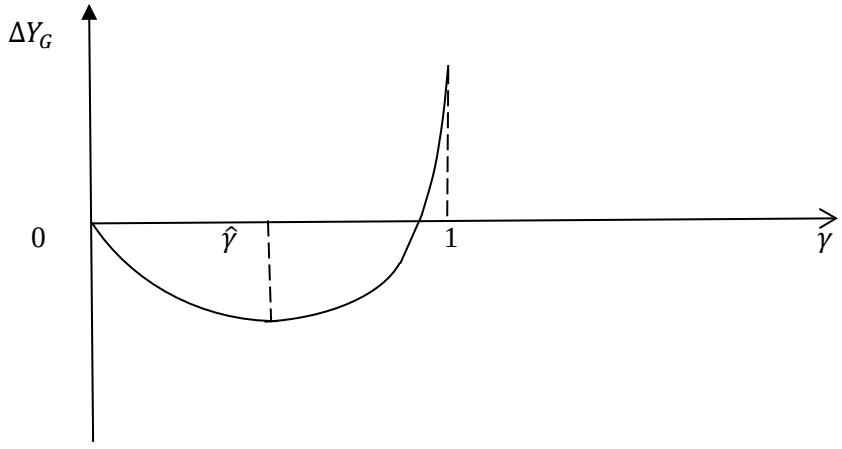

**Figure 3: Gainers and losers from linguistic globalization**