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Welfare-Optimal Status Planning: An Economic Approach

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Abstract

We analyze normatively determined distributions of language rights in multilingual settings. It is shown in a welfare-maximizing model where rights today influence the status of a language in the future, that the “naive” static cost-benefit analysis has to be augmented in various directions. This depends on the dynamic aspect as well as possible (fiscal) externalities on other communities. Within and between community distributional effect also play a rôle.

Keywords: Minority rights, changeable preferences, dynamic preferences, welfare function, second-best analysis, overlapping generations.

1 Introduction

Language is certainly the most important means of communication in all human societies. At the same time, language is one of the most important aspects of an individual’s personality, as well as of its social and cultural identity. These two aspects of language often find themselves in conflict with one another. On the one hand, network externality properties of the communication aspect imply that the greater is the number of speakers of a certain language, the more useful is that language in communication and in the limit it would be efficient to have only one single language for communication purposes.

Balancing this tendency is the desire of many individuals to preserve their language as a marker of identity. In a static perspective, language, like talents and other personal characteristics, can be seen as part of the definition, or initial endowment, of an individual. In a dynamic setting, however, the situation is slightly more complex. Firstly, we have to distinguish between dynamics within a generation and between generations. An individual can over its lifespan change its language, or acquire additional idioms. However, the more drastic changes occur between generations, where a language shift typically happens over three consecutive generations: the members of one generation are unilingual in one language, their children grow up bilingual and their grandchildren unilingual in the second language.

The survival of a language, its implantation in the next generation, depends on many factors, one of which is its status in society. This status is influenced by, among other things, the possibilities to use the language in various social areas, domains. Status planning is concerned with the issue of make languages official, but being official has to be operationalized and one way of achieving this is to give legal rights to speakers of a certain language to use it in different domains. Such domains that are subject to status

*Preliminary version.

planning, typically include various public offices, public education at different levels, public information such as street names or texts of laws and regulations.

Whether a language receives an official status in any specific domain or not, is very often a political issue, and it is an instrument that can be used by those in power – be it a dominant majority or a political elite – to control and exploit those who are weak, whether they are underprivileged masses or ethnic minorities or both. An analysis of these aspects is closely related to rent-seeking and political, social and economic power. These are questions analyzed in positive economics.

One can also, however, look at the problem from a normative perspective. One may look for acceptable allocations of rights according to some ethics criterion. The choice of rights for minorities can, for instance, be based on the equivalence principle, where (potential) Pareto improvements on some initial situation are to be realized within the community, or the desired allocation of rights may be governed by some other normative principles, such as the maximization of a (paternalistic) welfare function. The first approach is basically a cost-benefit analysis. One crucial assumption here is the definition of the point of reference, the *status quo*. Different choices lead to different conclusions. We discuss this in some detail in Wickström (2007). Since, as noted above, the preferences of future generations are partially determined by the actions and institutions of the currently living cohorts, the cost-benefit analysis will have to deal with endogenous preferences and path dependencies. This is discussed in Wickström (2010*b*). In that contribution, the long-run welfare-optimal allocations were also touched upon. The present paper analyzes this aspect in more detail.

The welfare function is seen as a representation of the preferences of a social planner. This is the exogenous point of departure of the welfare analysis. By representing the preferences of the social planner by a welfare function, we give the problem a consistent frame, within which the analysis can be carried out. Individual (indirect) utility functions are seen as functions of the (implicit) incomes of the individuals. A (Paretian) welfare function is in turn an increasing function in these individual utilities. The preferences of the social planner for redistribution are represented by the marginal welfare changes due to small income change for the various individuals. In comparing these marginal welfare values, the planner can find welfare-improving redistributions of income.¹

In this essay, we are discussing, how the desire to redistribute in favor of the disadvantaged alter the simple cost-benefit analysis. Thereby also the dynamic effect is considered. However, we do not undertake a dynamic analysis, but consider only the long-run steady states of welfare which we compare for different allocations of language rights.

1.1 Language and the allocation of rights

One can distinguish between various characteristics of the goods enjoyed by the individuals in a society. The actual use of a language is an individual matter, giving benefits to the individual using it.² Whether a person chooses to use a certain language or not in a given situation, will to a large extent depend upon the constraints it is facing. One important constraint is, of course, whether one is understood or not and manages to communicate. This can partially be determined by legal rights, forcing, for instance, public

¹Note that we are not attributing any "deeper" significance to the welfare function in the sense of social-choice theory. It is here only a representation of the preferences for income (re)distributions of a social planner. The only axioms implied are that it should respect Pareto efficiency and anonymity (see below). The second axiom simply says that an individual is only characterized by its implicit income, and two individuals with the same implicit income are treated identically.

²Of course, one person's use of a language might very well affect the well-being of the person it is talking to, or might want to communicate with, producing an externality, be it positive or negative. The larger is the number of speakers of a language, the greater is the potential number of contacts and, hence, the benefit of the language to a person knowing it. This network externality is central in the analysis of the long-term dynamics and equilibria of language usage as a means of communication. This is analyzed by, among others, Selten and Pool (1991), Church and King (1993), as well as Güth, Strobel, and Wickström (1997), who look at the benefits of learning other languages in addition to the mother tongue, and Wickström (2005), where the possibilities of the survival of communities of native speakers are analyzed. The present analysis treats this property of language usage as part of the set of the exogenous constraints facing the individual and is, hence, a possible factor influencing its propensity to pay for a certain language right.

offices to accept the use of certain languages in doing official business. Ignoring associated costs, such rights to communication in a certain language can in principle be made available to all individuals to the same extent. Unlike many other rights, like the right to smoke in public places versus the right to enjoy fresh air at the same location, the right to use a certain language in a given setting is a non-exclusive right that does not *per se* exclude the right to use another language in the same setting: My right to communicate with (and get answers from) a public office in Bislama, say, does not infringe on your right to use Volapük in doing your business with the same office.

Considering the costs of implementing a right, we note that in the dependency on the number of beneficiaries all possible degrees of economies of scale can occur. Having street signs in a certain language, involves only fixed costs, whereas the provision of elementary education is more or less proportional to the number of beneficiaries.

Here we are focusing on these legal rights and not on all other possibilities to use a language outside the public sector. The latter possibilities are, of course, determined primarily by the number of speakers, but also by other factors, such as the domain in which a certain interaction takes place. In a comprehensive analysis of language rights and justice also these aspects would have to be taken into account.³ In this essay, however, we limit the analysis to formal legal rights.

2 The basic model

The basic structure and notation closely follow that of Wickström (2010*b*).

2.1 Individuals

Society at time t is made up of a set N_t^0 of all individuals born into society at time t as well as the set N_{t-1}^0 of all individuals born at time $t-1$. That is, an individual lives two periods and the set of individuals alive in period t is given by $N_t := N_t^0 \cup N_{t-1}^0$. At birth an individual is socialized into a certain language l , where the set of all languages under consideration is denoted by L .⁴ The number of individuals of cohort t in language group l , that is the number of individuals born in period t into group l , is written as n_t^{l0} . Since individuals live for two periods, the number of older individuals alive at time t is n_{t-1}^{l0} . The total number of individuals in group l at time t is then $n_t^{l0} + n_{t-1}^{l0} =: n_t^l$.

2.2 Language rights

Let the set of legally defined domains be D . The set of rights in effect at time t is a matrix r_t of zeroes and ones. The right to use language l in domain d in period t is then written as $r_t^{ld} = 1$ and the denial of that right as $r_t^{ld} = 0$. The propensity of individual i to pay for a certain allocation of rights, r , is written as $b^i(r)$.

This propensity to pay is, of course, only well-defined in relation to a *status quo*. That is, we normalize the propensities to pay to be equal to zero at the *status quo*. Two possible polar choices are $\bar{r} = \mathbb{O}$, all r^{ld} are zero, and $\bar{r} = \mathbb{I}$, all r^{ld} are equal to one. The first case means that our benchmark is that there are no rights at all in effect and the second signifies that the benchmark is the existence of all possible rights in all domains for all languages.

Intuitively, one can say that, in the first case, we are born without any individual rights, and all rights have to be bought from society. In the second case, we are all born with all possible rights, and the

³For more general analyses in this direction, the reader is referred to, for instance, Kymlicka and Patten (2003) and the references therein. For a more formal analysis, see also Parijs (2002), as well as the contribution of the same author in Kymlicka and Patten (2003). A basic discussion can also be found in Wickström (2010*a*).

⁴For the purpose of this essay, we ignore the fact that individuals can belong to several language groups at the same time. The assumption that each individual is associated with one language simplifies the notational problems considerably and does not detract from the principal points of the analysis.

negation of any right has to be bought from the beneficiaries of that right by the rest of society.⁵ For the purpose of this essay, we will assume the former, that is $b^i(\mathbb{O})$ is set equal to 0 for all i . The right to be able to use a certain language in a certain situation can for our purposes be looked upon as a non-rival good. The “demand” or propensity to pay for this good will vary over the individuals. The sum of all individuals’ propensities to pay will then give society’s total propensity to pay for this specific right. A difference from the text-book case is that the rights are not continuous, but discrete non-rival goods. Of course, the individual propensity to pay will depend (directly or indirectly) on a number of exogenous factors such as income and prices, but also the availability of other language rights will enter the demand for any specific right to use a certain language.⁶

2.3 Costs

Let $c(r, n)$ be the costs to society that the realization of the rights allocation r causes compared to the *status quo*. The function c is assumed to be concave in n^l if $r^{ld} = 1$ for some d .⁷

2.4 Dynamic structure

It is reasonable to assume that the rights conveyed on speakers of language l in effect at period t influence the status of that language in that period and, hence, the choice of language of the next generation, that is the size of n_{t+1}^{l0} .⁸ That is, we assume, that parents in bringing up their children, decide on socializing them into their own language or another (majority) language depending on the status of the own language compared to the alternative language(s) – the emotional, cultural aspect – as well as on the number of speakers – the practical, communication aspect. Hence, the distribution of the individuals on the different language groups, as well as the rights given to the speakers of the various languages will determine the size of the groups in the next cohort. That is, the distribution of the next cohort on the language groups is assumed to be given by a function g , such that

$$n_{t+1}^0 = g(r_t, n_t^0), \quad (2.1)$$

with

$$\Delta_{\xi} n_{t+1}^{l0} := g^l(\bar{r}_t, n_t^0) - g^l(\hat{r}_t, n_t^0) > 0, \text{ if } \begin{cases} \Delta r_t^{md} := \bar{r}_t^{md} - \hat{r}_t^{md} = 0 \text{ for } m \neq l \\ \Delta r_t^{ld} = 0 \text{ for all } d \neq \xi \\ \Delta r_t^{l\xi} = 1 \end{cases} \quad (2.2)$$

$$0 \leq \frac{\partial g^l(r_t, n_t^0)}{\partial n_t^{l0}} < 1,$$

where n_t^0 is the vector of all n_t^{l0} . The population dynamics is then given by

$$\dot{n}_{t+1}^{l0} := n_{t+1}^{l0} - n_t^{l0} = g^l(r_t, n_t^0) - n_t^{l0}. \quad (2.3)$$

⁵For a further discussion of the choice of *status quo* the reader is referred to Wickström (2007), for instance.

⁶The latter point can be partially operationalized as the “linguistic distance” between the languages. See, for instance, the analysis in Ginsburgh, Ortuño-Ortín, and Weber (2005) or Fidrmuc, Ginsburgh, and Weber (2005). These authors use such a distance as a measure of disenfranchisement. However, the propensity to pay will in general depend on other factors, as well. Especially the emotional attachment to the language seems to be important. Compare, for instance, the situation in Wales, where virtually every Welch-speaker is bilingual in English, too – see, for instance, the statistics cited in Grin (1992) – or in the Basque country, where almost all speakers of Basque are bilingual in French or Spanish. Nevertheless, the propensity to pay for an official status of the respective language seems to be considerable among its speakers.

⁷For a further discussion of the assumptions on this function, see Wickström (2007).

⁸The long-run effects of certain allocation of language rights would be part of the “emotional” aspect in determining the propensities to pay. The designation of certain languages as “official” in given domains gives them a higher status, which reduces the incentives of following generations to use the non-official ones, reducing the number of their speakers. This can also lead to a situation of diglossia where the domains of the official language are constantly extended at the expense of non-official languages. This, in turn, would give the speakers of the official language a head start in life. In the long run, it might even lead to the death of non-official languages. For a further discussion of this possibility, see Wickström (2005).

2.4.1 Steady state

By setting $\dot{n}_{t+1}^{l0} = 0$ for all l , we find a (in general) different steady-state distribution of the language groups for any given allocation of rights in society:

$$n^{l0}(\bar{r}) > n^{l0}(\hat{r}) \left\{ \begin{array}{l} \Delta r^{md} := \bar{r}^{md} - \hat{r}^{md} = 0 \text{ if } m \neq l \\ \Delta r_t^{ld} \geq 0 \text{ for all } d \\ \Delta r^{ld} = 1 \text{ for some } d \end{array} \right. . \quad (2.4)$$

The implications of this dynamic structure in general are analyzed in some detail in Wickström (2010b). In this essay, we will look at the consequences of the different steady states.

2.5 Efficiency

In analyzing the efficient allocation of rights, one can first look for Pareto efficiency. This is done in Wickström (2010b) applying the compensated-variation criterion.

Letting N be the relevant set of individuals and suppressing the time index, we find the aggregated propensity to pay in society for any given allocation of rights, r , denoted by $b(r)$:

$$b(r) = \sum_{i \in N} b^i(r) \quad (2.5)$$

This has to be compared to the costs to society of providing these rights. The change in language rights from the *status quo* to r is an improvement according to the compensated-variation criterion if

$$\sum_{i \in N} b^i(r) > c(r). \quad (2.6)$$

By introducing compensation payments (or taxes), θ^i , we can reformulate this slightly differently. The sum of the compensation payments covers the costs of introducing the rights – the introduction is feasible – if θ is in the set

$$\Theta^F(r) := \left\{ \theta \left| \sum_{i \in N} \theta^i = c(r) \right. \right\}. \quad (2.7)$$

The net benefit to individual i of the allocation of rights r in comparison to the *status quo* is given by

$$\Delta a^i(r, \theta^i) := b^i(r) - \theta^i. \quad (2.8)$$

The necessary requirement that this allocation be a feasible (strong) Pareto improvement, is then that all Δa be positive, that is, that θ be in the set defined by

$$\Theta^P(r) := \{ \theta \in \Theta^F(r) \mid \Delta a^i(r, \theta^i) > 0, \forall i \}. \quad (2.9)$$

A feasible (strong) Pareto improvement then requires that

$$\theta \in \Theta^F(r) \cap \Theta^P(r). \quad (2.10)$$

If we ignore distributional aspects, we can define potential Pareto improvements by the set

$$\Theta^E(r) := \left\{ \theta \in \Theta^F(r) \left| \sum_{i \in N} \Delta a^i(r, \theta^i) > 0 \right. \right\}. \quad (2.11)$$

The compensated-variation criterion 2.6 is then equivalent to

$$\theta \in \Theta^F(r) \cap \Theta^E(r). \quad (2.12)$$

The Pareto-efficient allocations can then be found by maximizing the sum of the net benefits, denoted by S , over all possible allocations of rights subject to the feasibility constraint 2.7:

$$\max_r S, \text{ such that } S := \sum_{i \in N} \Delta a^i(r, \theta^i) \text{ and } \theta \in \Theta^F(r) \quad (2.13)$$

The program 2.13 can also be written as

$$\max_r \left[\sum_{i \in N} b^i(r) - c(r) \right]. \quad (2.14)$$

Clearly, the resulting $\theta \in \Theta^E(r)$, but if taxes are flexible, we can also find a $\theta \in \Theta^P(r) \subset \Theta^E(r)$, satisfying the solution to 2.13. This is the first-best Pareto-efficient solution to the problem of allocating language rights.

This can be modified in two ways. Firstly, not all tax structures are possible; specifically, the taxes in $\Theta^P(r)$ are not institutionally feasible. This necessitates a second-best analysis of the optimal language rights. Secondly, the social planner has preferences over distributions of incomes, postulating trade-offs between efficiency and egalitarian distributions. That is, the goal function, the welfare function, is more general than the (sum of) the net individual benefits, and problem 2.13 becomes a special case of the welfare analysis. Indeed, even if the taxes in $\Theta^P(r)$ were institutionally feasible, they might not be optimal. This latter problem, however, will not be analyzed in this essay.

3 Efficiency versus equality: welfare optimum

In order to address the issue of justice, as already noted, we need some standard of comparison between individuals. We will deal with the individual changes Δa^i from the given *status quo* and then discuss the criteria for the interpersonal comparison of these changes.

3.1 Welfare function

We define the (indirect) utility of an individual as a function of its income stream. In our case, it is given by some exogenous income ω^i plus the net benefit of the language rights Δa^i :

$$U^i = u^i(\omega^i + \Delta a^i) \quad (3.1)$$

The welfare function is defined as a function of the individual utilities:

$$W = w(U^1, \dots, U^n) \quad (3.2)$$

We assume that the welfare function is Paretian, that is:

$$\frac{\partial w}{\partial U^i} > 0, \forall i \quad (3.3)$$

The long-run change in welfare, ΔW , due to a change in a , Δa , can then be written as:

$$\Delta W = \sum_i \frac{\Delta w}{\Delta U^i} \frac{\Delta u^i}{\Delta a^i} \Delta a^i =: \sum_i \beta^i \Delta a^i \quad (3.4)$$

The parameter β^i is a function of ω^i and Δa^i and is the evaluation of the planner of a unit increase in income when it changes from ω^i to $\omega^i + \Delta a^i$.⁹ If the planner is interested in redistribution in favor of

⁹Of course, in a continuous setting the dependency on Δa disappears and β is just the marginal evaluation of an income increase given a certain income.

the poor, β^i is decreasing in both arguments. If the planner is only interested in efficiency, all β^i are constant and equal. If the planner treats all individuals anonymously and neutrally, that is, only the implicit income matters, all functions $\beta^i(\cdot)$ are identical and can be written $\beta(\cdot)$. In this essay, this is the case.

In looking at the long-run changes in W , we compare steady states and make a comparative-static analysis of two steady states. A truly dynamic analysis, on the other hand, would have to analyze a stream of values and compare the values at different times under some assumptions on discounting.¹⁰

3.2 Tax structure

Contrary to the analysis in section 2.5 it is now assumed that not all transfer payments are possible, but are restricted to some (institutionally given) set Ψ that defines the institutionally feasible taxes. That is, restriction 2.7 is replaced by

$$\theta \in \Psi \cap \Theta^F(r). \quad (3.5)$$

It is assumed that the vector of zeroes – no transfer payments – is in the set Ψ . Then, clearly, $0 \in \Psi \cap \Theta^F(r)$ and, by definition, the *status quo* \bar{r} is institutionally feasible, $\Delta a^i(\bar{r}, 0) = 0$.

The assumption of an institutionally restricted tax structure is crucial and necessitates a second-best analysis of the problem.

3.3 Simplifying assumptions

In order to make the analysis tractable, we limit ourselves to two languages, A and B , and two language groups N^A and N^B of size n^A and n^B . Further, the propensities to pay are positive only for the proper language; that is, the propensity to pay $b^{iL} > 0$ if $i \in N^L$ and $b^{iL} = 0$ if $i \notin N^L$. We only consider one domain, and the taxes paid by individual i for financing a right of language L in that domain is denoted by θ^{iL} . We then compare the situation with the introduction of a right in this domain for both languages $r^A = r^B = 1$ with a situation where the right is only introduced for language A , $r^A = 1$, $r^B = 0$. The corresponding cost functions are written $c(n^A)$ and $c(n^B)$.

3.4 Welfare effects

If the right is introduced for both languages the change in welfare from the *status quo* is:

$$\begin{aligned} \sum_i \beta_1^i \Delta a_1^i &= \sum_{i \in N^A \cup \Delta N^A} (b^{iA} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i \\ &+ \sum_{i \in N^B \cup \Delta N^B} (b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i \end{aligned} \quad (3.6)$$

Here, $\beta_1^i := \beta(\omega^i, b^{iA} + b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB})$ and the dynamic effects discussed in section 2.4 are given by ΔN^A and ΔN^B and the corresponding changes Δb^{iB} and $\Delta \theta^{iL}$. Again, it be noted that we do not claim to carry out a true dynamic analysis, but simply limit ourselves to a comparative-static analysis of different steady states.

If there is no right introduced for language B , the welfare change from the *status quo* is given by:

$$\sum_i \beta^i \Delta a_0^i = \sum_{i \in N^A} (b^{iA} - \theta^{iA}) \beta_0^i - \sum_{i \in N^B} \theta^{iA} \beta_0^i \quad (3.7)$$

Here, $\beta_0^i := \beta(\omega^i, b^{iA} - \theta^{iA})$. Under the assumption that β is non-increasing in its arguments, that is, redistributive preferences of the planner go in favor of poorer individuals, and that individuals only care

¹⁰In Wickström (2007) this is briefly discussed.

about the status of their own language, we find that for $i \in N^A$, $\Delta\beta^i := \beta_1^i - \beta_0^i$ will have the sign of $\theta^{iB} + \Delta\theta^{iA} + \Delta\theta^{iB} = 0$. For $i \in N^B$, it will have the opposite sign of $b^{iB} - \theta^{iB} + \Delta b^{iB} - \Delta\theta^{iA} - \Delta\theta^{iB}$.

Comparing welfare in the two cases, we find the following difference:

$$\begin{aligned} \Delta W = & \sum_{i \in N^A \cup \Delta N^A} (b^{iA} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}) \beta_1^i - \sum_{i \in N^A} (b^{iA} - \theta^{iA}) \beta_0^i \\ & + \sum_{i \in N^B \cup \Delta N^B} (b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}) \beta_1^i + \sum_{i \in N^B} \theta^{iA} \beta_0^i \end{aligned} \quad (3.8)$$

It is welfare improving to introduce the right for language B if ΔW is positive. This is our decision criterion. This expression reduces to:

$$\begin{aligned} \Delta W = & \overbrace{\bar{\beta}_1^B (b^B - \theta^B)}^{\text{direct net benefit}} + \overbrace{(\bar{\beta}_1^B - \bar{\beta}_1^A) \theta^{AB}}^{\text{direct fiscal externality}} \\ & + \overbrace{\bar{\beta}_1^B b^B V_b^B - \bar{\beta}_1^A \theta^{AB} V_\theta^{AB} - \bar{\beta}_1^B \theta^{BB} V_\theta^{BB}}^{\text{group-internal distribution effects}} \\ & + \overbrace{\Delta \bar{\beta}^A (b^A - \theta^A) - (\Delta \bar{\beta}^B - \Delta \bar{\beta}^A) \theta^{BA}}^{\text{income effects}} \\ & + \overbrace{\Delta \bar{\beta}^A [b^A V_b^{\Delta\beta A} - \theta^{AA} V_\theta^{\Delta\beta AA}] - \Delta \bar{\beta}^B \theta^{BA} V_\theta^{\Delta\beta BA}}^{\text{group-internal distribution effects due to income effects}} \\ & + \overbrace{\bar{\beta}_1^A [\Delta_N b^A - \Delta_N \theta^{AA} - \Delta_N \theta^{AB}]}^{\text{net benefit dynamic effect on group A}} \\ & + \overbrace{\bar{\beta}_1^B [\Delta_N b^B - \Delta_N \theta^{BA} - \Delta_N \theta^{BB}]}^{\text{net benefit dynamic effect on group B}} \\ & + \overbrace{\bar{\beta}_1^A [\Delta_N b^A V_b^A - \Delta_N \theta^{AB} V_\theta^{AB} - \Delta_N \theta^{AA} V_\theta^{AA}]}^{\text{dynamic distribution effect on group A}} \\ & + \overbrace{\bar{\beta}_1^B [\Delta_N b^B V_b^B - \Delta_N \theta^{BB} V_\theta^{BB} - \Delta_N \theta^{BA} V_\theta^{BA}]}^{\text{dynamic distribution effect on group B}} \end{aligned} \quad (3.9)$$

Here, the various average and aggregated values are defined by:

$$\begin{aligned} \bar{\beta}_1^L & : = \frac{1}{n^L} \sum_{i \in N^L} \beta_1^i = \frac{1}{\Delta n^L} \sum_{i \in \Delta N^L} \beta_1^i \\ \bar{b}^L & : = \frac{1}{n^L} \sum_{i \in N^L} b^{iL} \\ b^L & : = \sum_{i \in N^L} b^{iL} \\ \bar{\theta}^{LM} & : = \frac{1}{n^L} \sum_{i \in N^L} \theta^{iM} \\ \theta^L & : = \sum_{i \in N^A} \theta^{iL} + \sum_{i \in N^B} \theta^{iL} = c(n^L) \\ \Delta \bar{\beta}^L & : = \frac{1}{n^L} \sum_{i \in N^L} \Delta \beta_1^i = \frac{1}{\Delta n^L} \sum_{i \in \Delta N^L} \Delta \beta_1^i \end{aligned} \quad (3.10)$$

That is, $\bar{\beta}_1^L$ is the planner's average evaluation of the of an income increase in group L . It is assumed that if there is a change in the size of the group the new individuals are representative in the sense that their distribution of income mirrors that of the original members. The average propensity to pay for the right in group L is \bar{b}^L and the total propensity to pay is b^L etc. The change in the total propensity to pay and in the tax due to the dynamic effects are given by:

$$\begin{aligned}\Delta_N b^L &:= \bar{b}^L \Delta n^L + \Delta \bar{b}^L n^L + \Delta \bar{b}^L \Delta n^L \\ \Delta_N \theta^{LM} &:= \bar{\theta}^{LM} \Delta n^L + \Delta \bar{\theta}^{LM} n^L + \Delta \bar{\theta}^{LM} \Delta n^L\end{aligned}\quad (3.11)$$

Finally, the V 's represent the distributional effects:

$$\begin{aligned}V_b^L &:= \sum_{i \in N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (b^{iL} - \bar{b}^L)}{\bar{\beta}_1^L \bar{b}^L n^L} = \sum_{i \in \Delta N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (b^{iL} - \bar{b}^L)}{\bar{\beta}_1^L \bar{b}^L \Delta n^L} \\ &= \sum_{i \in N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\Delta b^{iL} - \Delta \bar{b}^L)}{\bar{\beta}_1^L \Delta \bar{b}^L n^L} = \sum_{i \in \Delta N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\Delta b^{iL} - \Delta \bar{b}^L)}{\bar{\beta}_1^L \Delta \bar{b}^L n^L} \\ V_{\theta}^{LM} &:= \sum_{i \in N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\theta^{iM} - \bar{\theta}^{LM})}{\bar{\beta}_1^L \bar{\theta}^{LM} n^L} = \sum_{i \in \Delta N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\theta^{iM} - \bar{\theta}^{LM})}{\bar{\beta}_1^L \bar{\theta}^{LM} \Delta n^L} \\ &= \sum_{i \in N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\Delta \theta^{iM} - \Delta \bar{\theta}^{LM})}{\bar{\beta}_1^L \Delta \bar{\theta}^{LM} n^L} = \sum_{i \in \Delta N^L} \frac{(\beta_1^i - \bar{\beta}_1^L) (\Delta \theta^{iM} - \Delta \bar{\theta}^{LM})}{\bar{\beta}_1^L \Delta \bar{\theta}^{LM} n^L} \\ V_b^{\Delta \beta L} &:= \sum_{i \in N^L} \frac{(\Delta \beta^i - \Delta \bar{\beta}^L) (b^{iL} - \bar{b}^L)}{\Delta \bar{\beta}^L \bar{b}^L n^L} = \sum_{i \in \Delta N^L} \frac{(\Delta \beta^i - \Delta \bar{\beta}^L) (b^{iL} - \bar{b}^L)}{\Delta \bar{\beta}^L \bar{b}^L \Delta n^L} \\ V_{\theta}^{\Delta \beta LM} &:= \sum_{i \in N^L} \frac{(\Delta \beta^i - \Delta \bar{\beta}^L) (\theta^{iL} - \bar{\theta}^{LM})}{\Delta \bar{\beta}^L \bar{\theta}^{LM} n^L} = \sum_{i \in \Delta N^L} \frac{(\Delta \beta^i - \Delta \bar{\beta}^L) (\theta^{iL} - \bar{\theta}^{LM})}{\Delta \bar{\beta}^L \bar{\theta}^{LM} \Delta n^L}\end{aligned}\quad (3.12)$$

Again, we are assuming that the dynamic effects do not influence the distributional characteristics of taxes and propensities to pay in the communities.

3.5 Welfare implications

Expression 3.9 consists of several effects. We will discuss them one at the time. First we look at the pure efficiency effect.

3.5.1 Efficiency

If the planner is only interested in efficiency, only the net benefit effects matter and expression 3.9 becomes identical to expression 2.6:

$$\begin{aligned}\frac{\Delta W}{\bar{\beta}} &= b^B - \theta^B \\ &\quad + \Delta_N b^A - \Delta_N \theta^{AA} - \Delta_N \theta^{AB} \\ &\quad + \Delta_N b^B - \Delta_N \theta^{BA} - \Delta_N \theta^{BB}\end{aligned}\quad (3.13)$$

This is equal to

$$\begin{aligned}\frac{\Delta W}{\bar{\beta}} &= b^B - \theta^B \\ &\quad + \Delta_N b^A - \Delta_N \theta^A + \Delta_N b^B - \Delta_N \theta^B\end{aligned}\quad (3.14)$$

The first line is the *ex ante* net benefit of the introduction of the right for language B and the second lines gives the dynamic effect due to an increase in n^B and \bar{b}^B and a corresponding decrease in n^A . Associated with this there will be a change in the taxes with an increase in θ^B and a decrease in θ^A . Because of the concavity of the cost function and the fact that $n^A > n^B$, the increase in θ^B will be greater than or equal to the decrease in θ^A . That is:

$$\frac{\Delta W}{\bar{\beta}} \leq b^B - \theta^B + \Delta_N b^A + \Delta_N \theta^B \quad (3.15)$$

If the average propensity to pay is the same in both communities, or if it is lower in the B community, and if \bar{b}^B does not change, $\Delta_N b^A + \Delta_N \theta^B \leq 0$ and the *ex ante* cost-benefit analysis would provide a too optimistic criterion for the decision to introduce the right for language B . It would not properly take the concave cost structure into account. Only if there are no variable costs in providing the right, and the average propensities to pay in both communities are the same, the *ex ante* criterion would be applicable. The increase in n^B , which would change the calculus in favor of introducing the right for language B , would be exactly balanced by a negative externality on community A . If \bar{b}^B increases due to the dynamic effect, or if it originally is bigger than the average in the A community, this result is, of course, relativized and the *ex ante* efficiency condition could, indeed, be too pessimistic.

3.5.2 Redistribution

There are several distribution effects, both on the benefit and the fiscal side, as well as an income effect on the A community.

Income effect The income effect is, on the one hand, due to the fact that, in the presence of a fiscal externality, the introduction of the right for community B is partially paid by community A , hence reducing the average income in that community, thereby increasing its average weight in the welfare function and, on the other hand, due to the change in the implicit income of the individuals in community B because of the introduction of the right. There is both a direct and a distribution effect. The direct effect is:

$$\Delta \bar{\beta}^A (b^A - \theta^A) - (\Delta \bar{\beta}^B - \Delta \bar{\beta}^A) \theta^{BA} \quad (3.16)$$

In the absence of the dynamic effect, first term is clearly positive, if the fiscal externality θ^{BA} is positive. Indeed, if the fiscal externality is positive, we can rewrite the expression as:

$$\Delta \bar{\beta}^A (b^A - \theta^{AA}) - \Delta \bar{\beta}^B \theta^{BA} \quad (3.17)$$

With a linear approximation of the β functions the second term will vanish for the net benefit of the introduction of the right equal to zero, $b^B - \theta^B = 0$. That is, the term contributes to making the welfare change positive if the simple net benefit criterion leads to indifference; that is, it is an argument for a more liberal policy in favor of the B community. This, of course, has to be seen in relation to the direct fiscal externality:

$$(\bar{\beta}_1^B - \bar{\beta}_1^A) \theta^{AB} \quad (3.18)$$

If the two communities, on the average, are comparable, the income effect compensates for the unequal treatment of the smaller B community, comparing an unequal situation without the right and a more equal situation with the right, making the latter more desirable. When the fiscal externality vanishes, the whole expression becomes zero unless there is a dynamic effect, which would make $\Delta \bar{\beta}^A$ positive, since the average tax of an A individual would increase. This would have the same effect.

The indirect effect of the income effect on the distribution is similar to the general distribution effects and is treated below.

Distribution effects between the communities If the communities are unequal in the eyes of the planner, there is a redistribution effect due to the fiscal externality:

$$(\bar{\beta}_1^B - \bar{\beta}_1^A) \theta^{AB} \quad (3.19)$$

If the B community is underprivileged, this effect is clearly positive and an argument for more extensive language rights.

Distribution effects within the communities There are distribution effects due to the propensities to consume as well as the taxation. We assume that the income effects on the β 's are proportional to the β_1 's. Then:

$$\begin{aligned} V_b^{\Delta\beta L} &= V_b^L \\ V_\theta^{\Delta\beta LM} &= V_\theta^{LM} \end{aligned} \quad (3.20)$$

The collected distribution effects are then given by:

$$\begin{aligned} &\bar{\beta}_1^B [b^B + \Delta_N b^B] V_b^B + [\bar{\beta}_1^A \Delta_N b^A + \Delta \bar{\beta}^A b^A] V_b^A \\ &- \bar{\beta}_1^B [\theta^{BB} + \Delta_N \theta^{BB}] V_\theta^{BB} - [\bar{\beta}_1^B \Delta_N \theta^{BA} + \Delta \bar{\beta}^B \theta^{BA}] V_\theta^{BA} \\ &- \bar{\beta}_1^A [\theta^{AB} + \Delta_N \theta^{AB}] V_\theta^{AB} - [\bar{\beta}_1^A \Delta_N \theta^{AA} + \Delta \bar{\beta}^A \theta^{AA}] V_\theta^{AA} \end{aligned} \quad (3.21)$$

If taxes are positively correlated with income, all V_θ^{LM} are negative, if the planner wants to redistribute from the poor to the rich. That is, we have a positive effect on welfare from the introduction of the right for language B due to the increase in taxes necessitated by the realization of this right. The dynamic effect, reducing n^A works in the opposite direction. However, since the total fiscal effect is a tax increase, the net effect will be positive if the communities are comparable in the eyes of the planner. If all V_θ 's and the $\bar{\beta}_1$'s are equal, we find:

$$\begin{aligned} &\bar{\beta}_1 [(b^B + \Delta_N b^B) V_b^B + (\bar{\beta}_1^A \Delta_N b^A + \Delta \bar{\beta}^A b^A) V_b^A] \\ &- \bar{\beta}_1 [\theta^B + \Delta_N \theta^B + \Delta_N \theta^A] V_\theta \\ &- [\Delta \bar{\beta}^A \theta^{AA} + \Delta \bar{\beta}^B \theta^{BA}] V_\theta \end{aligned} \quad (3.22)$$

Since the dynamic effect increases taxes, the second term is clearly positive. The third term will in general also be positive if the net benefits are close to zero. The fiscal distribution effect hence provides an argument for more extensive language rights than what is implied by the net benefit.

The effect due to the propensities to pay will be positive if the demand for language rights has a negative income elasticity, that is, if they are an inferior good. If not, that effect pulls towards less extensive rights.

3.6 Conclusions

In the previous analysis, we have seen that there are arguments for more extensive language rights for a linguistic minority than what comes out of an *ex ante* cost-benefit analysis. But there are also arguments for an optimal discrimination of the minority.

For discrimination in this sense speaks the cost structure in a dynamic setting. Generally, due to concavity, the *per-capita* costs of a certain right increases faster for the minority than for the majority by an equal change in the size of the group. On the other hand, in a dynamic setting, the possible increase in the propensities to pay for the right of members of the minority due to the higher status of the minority language works in the opposite direction.

Income effect		Fiscal externality		Dynamic effect		Tax distribution		Propensities distribution	
Fiscal externality		Minority/majority income difference		$\Delta \bar{b}^B$		Tax and income correlation		Language rights	
positive	zero	negative	positive	positive	zero	positive	negative	inferior	normal
+	0/+	+	-	+/-	-	+	-	+	-

Table 1: Different welfare effects on the optimal realization of minority rights

If the minority community is poorer than the majority, the introduction of the right and the associated fiscal externalities on the majority provides arguments for more extensive rights of the minority than implied by the simple cost-benefit analysis.

Finally, distributional fiscal effects within the communities provide arguments for more rights for the minority, as does the distributional effect of the propensities to pay if language rights are inferior goods.

In table 1 these effects are summarized.

4 Concluding remark

In this essay we have tried to examine systematically the factors influencing the normative arguments for the allocation of language rights to a linguistic minority from an economic point of view. We have seen that in a welfare-economics based analysis a simple cost-benefit analysis has to be augmented in various directions.

The scope of the study has been limited to rights in formal domains which can be regulated by legal means. The larger – and probably more important – issue of how to deal with linguistic discrimination in the market place, has been totally ignored.

Also the question what constitutes a legitimate minority, is not the topic of this essay. Should recent immigrants be treated differently from minorities, whose ancestors have lived in a territory for numerous generations, often much longer than the majority population? A related question is: When does a newly arrived group (European immigrants to North America) become the legitimate majority in a territory and left-over members of the old majority a “normal” minority? This opens up many interesting, contradictory and important questions, which can be approached and partially resolved by economic methodology. These are, however, the topics left for future essays.

References

- CHURCH, JEFFREY and IAN KING (1993). “Bilingualism and network externalities.” In: *Canadian Journal of Economics/Revue canadienne d’économique* **26**, pages 337–345.
- FIDRMUC, JAN, VICTOR GINSBURGH, and SHLOMO WEBER (2005). *Economic challenges of multilingual societies*. Research report.
- GINSBURGH, VICTOR, IGNACIO ORTUÑO-ORTÍN, and SHLOMO WEBER (2005). “Disenfranchisement in linguistically diverse societies. The case of the European Union.” In: *Journal of the European Economic Association* **3**, pages 946–965.
- GRIN, FRANÇOIS (1992). “Towards a threshold theory of minority language survival.” In: *Kyklos* **45**, pages 69–97.

- GÜTH, WERNER, MARTIN STROBEL, and BENGT-ARNE WICKSTRÖM (1997). “Equilibrium selection in linguistic games: Kial ni (ne) parolas esperanton?” In: *Understanding strategic interaction: Essays in honor of Reinhard Selten*. Edited by WULF ALBERS, WERNER GÜTH, PETER HAMMERSTEIN, BENNY MOLDOVANU, and ERIC VAN DAMME. Berlin: Springer, pages 257–269.
- KYMLICKA, WILL and ALAN PATTEN, editors (2003). *Language rights and political theory*. Oxford: Oxford University Press.
- PARIJS, PHILIPPE VAN (2002). “Linguistic justice.” In: *Politics, Philosophy and Economics* **1.1**, pages 59–74.
- SELTEN, REINHARD and JONATHAN POOL (1991). “The distribution of foreign language skills as a game equilibrium.” In: *Game equilibrium models IV*. Edited by REINHARD SELTEN. Berlin: Springer, pages 64–84.
- WICKSTRÖM, BENGT-ARNE (2005). “Can bilingualism be dynamically stable? A simple model of language choice.” In: *Rationality and Society* **17.1**, pages 81–115.
- (2007). “Fairness, rights, and language rights: On the fair treatment of linguistic minorities.” In: *Public Economics and Public Choice*. Edited by PIO BAAKE and RAINALD BORCK. Berlin: Springer, pages 81–101.
- (2010a). “Lingvaj rajtoj kaj lingva justeco.” In: *La arto labori kune: Festlibro por Humphrey Tonkin*. Edited by DETLEV BLANKE and ULRICH LINS. Rotterdam: Universala Esperanto-Asocio, pages 97–103.
- (2010b). *The optimal Babel: An economic framework for the analysis of dynamic language rights*. Research report 2956. München: CESifo.