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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 "naïve" ex ante cost-benefit analysis has to be augmented in various directions. This has its roots in the dynamic aspect of the rights and the resulting endogeneity of preferences as well as in the discrete character of rights. It is shown how efficiency and distribution considerations are affected by these considerations.

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

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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. We can here distinguish between dynamics within a generation and between generations.

An individual can over its lifespan change its language, or acquire additional idioms. This is part of the "normal" planning of the individual. However, the more important aspect is the change between generations. Each new-born individual is endowed with its own characteristics, defining this individual. This endowment is often, at least partially, determined by the individuals of the previous generation. If the generations were not to overlap and if the preferences and other endowments were not transferred to the next generations by the parent generations, the intertemporal aspect would be without consequence for a welfare analysis. The input into the analysis, preferences and other endowments at any given time, would be independent of previous situations, and we would have a sequence of static analyses.

This is different, however, if endowments and preferences are passed on, however incompletely. Then, the individuals of the present generation influence the environment of the coming generations, and in a welfare analysis this would have to be accounted for. The analysis is further complicated by the fact that generations overlap. The transmitted preferences to the new cohorts have a direct effect on the distribution of preferences during the life-time of individuals of the parent generation and, hence, on the inputs into the welfare analysis during their life-time.

Looking at language, we note that the drastic changes in language use 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 defining the official status of a languages. This has to be operationalized, however, and one way of achieving this is giving legal rights to speakers of a certain language to use it in different domains. Such domains – subject to status 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, among other disciplines, positive economics and will not be further treated in this essay.

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 (2010b). 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 discuss, 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. In comparison to a traditional welfare-optimizing analysis there are, hence, some added ingredients that alter the analysis in different ways. First, we deal with discrete changes, which implies that there are discrete jumps in implicit incomes and hence in the marginal evaluations of the social value of income redistributions; we call this the "income" effect. Second, preferences are to a certain extent endogenous. Third, there are long-run endogenous dynamic effects altering the composition as well as the individual preferences of the population. We demonstrate, how the welfare changes can be decomposed into the implications of these different effects. We also decompose the welfare changes into efficiency and distribution effects.

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 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

[1] Note 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.

[2] Of 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 in, for instance, Wickström (2005), Fernando, Valijärvi, and Goldstein (2010), Patriarca and Leppänen (2004), or Minett and Wang (2008), where the possibilities of the survival of communities of native speakers are analyzed. The present analysis treats this externality property of language usage as part of the set of exogenous constraints facing the individual and is, hence, a possible factor influencing its propensity to pay for a certain language right.

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, does not depend on the number of speakers of the idiom, involving only fixed costs in this respect, 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 the many other possibilities to use a language outside of the public sector. The latter possibilities are 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.

1.2 Status

Preferences are endogenous in two manners. By giving their mother tongue to the off-springs, the parent generation influences the preferences for different language regimes in society. We model this as a function of the status the language enjoys, when the parents make their decision. The higher the status of the language, the higher the probability that a member of the following generation will adopt it and have preferences for its use in society. The second way preferences are endogenous is also given by the status of the idiom. A given individual's preferences for giving rights to the language is modeled to depend on the social status of the language. That is, the propensities to pay for language rights are determined by the status the language enjoys among its speakers, both through a direct effect on the individuals alive at a certain time, and through an indirect, dynamic, effect determining the number of speakers in the next generation.

By relating the status of a language to the formal rights granted to the usage of the language, we introduce a feed-back mechanism into the system.[4]

2 The basic model

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

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.[5] 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 $n_t^{l0} + n_{t-1}^{l0} =: n_t^l$.

[3] For 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 (2010a).

[4] The structure could easily be adopted to deal with questions related to various forms of education. The members of the parent generation decides on the education given to the members of the next generation, which in turn influence their preferences for educating their children etc. This process could lead to very different societies in the long run equilibria.

[5] For 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.

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 negation of any right has to be bought from the beneficiaries of that right by the rest of society.[6] 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.[7]

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.[8]

2.4 Dynamic structure

Here, we can distinguish two types of dynamic effects. There is one effect due to the intergenerational structure determining the composition of the society in terms of language groups. There is another effect due to the possible change in preferences of individual users of a language as a result of status changes. This effect simply says that the propensity to pay for rights for the language might be different after a right has been introduced than before the introduction, if the implementation of the right increases the status of the language, making the speakers evaluate this and further rights more positively.

The second effect has to do with the transmission of the language to following generations. It is also here 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, their choice of language for the next generation, that is the size of n_{t+1}^{l0}.[9] That is, we assume, that parents in bringing up their children,

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

[7] The 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. Consider, 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.

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

[9] The 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

decide on socializing them into their own language or another (majority) language depending, on the one hand, on the status of the own language compared to the alternative language(s) – the emotional, cultural aspect – as well as, on the other hand, 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

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

with

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

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

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

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

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:

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

The implications of this dynamic structure in general are analyzed in some detail in Wickström (2010b). In this essay, we will look at the welfare 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 $b\left(r\right)$:

$$b\left(r\right) = \sum_{i \in N} b^i\left(r\right) \tag{2.5}$$

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

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

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).

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

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

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

$$\Delta a^i\left(r, \theta^i\right) := b^i(r) - \theta^i. \tag{2.8}$$

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

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

A feasible (strong) Pareto improvement then requires that

$$\theta \in \Theta^F(r) \cap \Theta^P(r). \tag{2.10}$$

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

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

The compensated-variation criterion 2.6 is then equivalent to

$$\theta \in \Theta^F(r) \cap \Theta^E(r). \tag{2.12}$$

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:

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

The program 2.13 can also be written as

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

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 more egalitarian distributions. That is, the goal function, the welfare function, is more general than the (sum of) 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 are not necessarily optimal.

3 Efficiency versus equality: welfare optimization

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 a^i. In our case, it is given by some exogenous income ω^i plus the net benefit of the language rights Δa^i:

$$U^i = u^i\left(\omega^i + \Delta a^i\right) \tag{3.1}$$

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

$$W = w\left(U^1, ..., U^n\right) \tag{3.2}$$

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

$$\frac{\partial w}{\partial U^i} > 0, \forall i \tag{3.3}$$

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

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

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 a^i when it changes from ω^i to $\omega^i + \Delta a^i$.[10] If the planner is interested in redistribution in favor of 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 as $\beta(\cdot)$. 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.[11]

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

$$\theta \in \Psi \cap \Theta^F(r). \tag{3.5}$$

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 as $c\left(n^A\right)$ and $c\left(n^B\right)$.

[10] Of 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. Because of the discrete nature of the problem analyzed, we will have an "income" effect on the β's, since they in general are different before and after the change.

[11] In Wickström (2007) this is briefly discussed.

3.4 Welfare effects

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

$$\sum_i \beta_1^i \Delta a_1^i = \sum_{i \in N^A \cup \Delta N^A} \left(b^{iA} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) \beta_1^i + \sum_{i \in N^B \cup \Delta N^B} \left(b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) \beta_1^i \tag{3.6}$$

Here, $\beta_1^i := \beta\left(\omega^i, b^{iA} + b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right)$. The change in taxes of individual i without the dynamic effects is given by θ^{iB} and the dynamic effects discussed in section 2.4 are given by ΔN^A and ΔN^B, the changes in the steady-state sizes of the two communities due to the higher status of language B caused by the implementation of the right, and the corresponding changes Δb^{iB}, the increased propensity to pay for giving the right to language B due to its increased status caused by the implementation of the right, and $\Delta\theta^{iL}$, the change in the taxes due to the change in the steady-state sizes of the two communities after the implementation of the right for language B. Again, be it 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:

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

Here, $\beta_0^i := \beta\left(\omega^i, b^{iA} - \theta^{iA}\right)$. Under the assumption that β is non-increasing in its arguments, that is, the redistributive preferences of the planner go in favor of poorer individuals, and that individuals only care about the status of their own language, we find that for $i \in N^A$, $\Delta\beta^i := \beta_1^i - \beta_0^i$ wil have the sign of $\theta^{iB} + \Delta\theta^{iA} + \Delta\theta^{iB}$. 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:

$$\Delta W = \sum_{i \in N^A \cup \Delta N^A} \left(b^{iA} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) \beta_1^i - \sum_{i \in N^A} \left(b^{iA} - \theta^{iA}\right) \beta_0^i + \sum_{i \in N^B \cup \Delta N^B} \left(b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) \beta_1^i + \sum_{i \in N^B} \theta^{iA} \beta_0^i \tag{3.8}$$

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

criterion. This expression can be decomposed into several effects:

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

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

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

That is, $\bar{\beta}_1^L$ is the planer's average evaluation of the marginal change in welfare 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:

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

Finally, the V's represent the distributional effects:

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

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

4 Implications for welfare optimization

Expression 3.9 consists of several effects. As our benchmark we take the simple *ex ante* cost-benefit analysis, comparing b^B and β^B. We then look at the modifications that become necessary by the extension to the case with endogenous preferences (the status effect), by distribution considerations and due to the intergenerational dynamic effect as well as because of the discrete nature of the problem. We discuss the various effects separately. First we ignore distributional considerations and look at the pure efficiency aspect.

4.1 Efficiency

If the planner is only interested in efficiency, all the β's are identical and only the net-benefit effects matter. Expression 3.9 becomes identical to expression 2.6 with the dynamic effects added:

$$
\begin{aligned}
\frac{\Delta W}{\bar{\beta}} &= b^B - \theta^B \\
&\quad + \Delta b^A - \Delta\theta^{AA} - \Delta\theta^{AB} \\
&\quad + \Delta b^B - \Delta\theta^{BA} - \Delta\theta^{BB}
\end{aligned}
\tag{4.1}
$$

4.1.1 Static case

In the static case, this reduces to:

$$
\frac{\Delta W}{\bar{\beta}} = \left(b^B - \theta^B\right) + \Delta b^B
$$

Here the change in b^B is only due to a possible increase in $\bar{b}^B$ because of the added status language B is enjoying after the right has been realized. If Δb^B is indeed positive, that is, the aggregate propensity to pay for the right is status dependent (the preferences are endogenous), the second term is positive.

This provides a clear argument for more extensive language rights than what is implied by the *ex ante* cost-benefit benchmark.

4.1.2 Dynamic case

In the dynamic case, 4.1 can be written as:

$$\frac{\Delta W}{\bar{\beta}} = b^B - \theta^B + \Delta b^A - \Delta \theta^A + \Delta b^B - \Delta \theta^B \tag{4.2}$$

Now a change in the size of the two communities has to be taken into consideration. The first line is the *ex ante* net benefit of the introduction of the right for language B and the second line gives the dynamic effect due to an increase in n^B and possibly in $\bar{b}^B$ and a corresponding decrease in n^A. Associated with this there will be a change in the taxes with an increase in θ^B, the costs of giving the right to B and a decrease in the costs of implementing the right for A, 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. We write the total change in the costs as $\Delta\theta$. That is:

$$\frac{\Delta W}{\bar{\beta}} = b^B - \theta^B + \Delta b^A + \Delta b^B - \Delta \theta \tag{4.3}$$

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, $\Delta b^A + \Delta b^B \leq 0$ 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 in this case be exactly balanced by a negative externality on community A. If $\bar{b}^B$ increases due to the status 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.

In comparison to the static case, the dynamic analysis hence provides arguments for less extensive language rights due to the concave cost structure in the implementation of the rights.

4.2 Redistribution

There are several distribution effects, both on the benefit and the fiscal side, as well as an income effect on the A community. The distribution effects on the fiscal side are connected with the tax system and its redistributive properties due to the fact that benefits and costs are not perfectly correlated. This is no different from other tax-financed public activities.

4.2.1 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:

$$\left(\bar{\beta}_1^B - \bar{\beta}_1^A\right)\theta^{AB} + \bar{\beta}_1^A\left[{}_N b^A - \Delta\theta^{AA} - \Delta\theta^{AB}\right] + \bar{\beta}_1^B\left[\Delta b^B - \Delta\theta^{BA} - \Delta\theta^{BB}\right] \tag{4.4}$$

If the endogenous effect and the dynamic effects are ignored, this reduces to:

$$\left(\bar{\beta}_1^B - \bar{\beta}_1^A\right)\theta^{AB} \tag{4.5}$$

If the B community is underprivileged – if it, for instance, suffers discrimination –, this effect is clearly positive and an argument for more extensive language rights for the B community. Autonomous communities would make the fiscal externality equal to zero. This would imply earmarked taxes, which is hardly possible under realistic political constraints on the tax rules, the set Ψ.

The consideration of the endogeneity of the preferences changes the expression into:

$$\left(\bar{\beta}_1^B - \bar{\beta}_1^A\right)\theta^{AB} + \bar{\beta}_1^B \Delta b^B \tag{4.6}$$

This provides an added argument for more extensive rights for language B than in the benchmark case.

Taking the dynamic effect into account, we find:

$$\left(\bar{\beta}_1^B - \bar{\beta}_1^A\right)\theta^{AB} + \bar{\beta}_1^A\left[\Delta b^A - \Delta\theta^{AA} - \Delta\theta^{AB}\right] + \bar{\beta}_1^B\left[\Delta b^B - \Delta\theta^{BA} - \Delta\theta^{BB}\right] \tag{4.7}$$

Letting $\Delta\theta$ be the total change in taxes due to the dynamic effect, we have:

$$\Delta\theta = \Delta\theta^{AA} + \Delta\theta^{AB} + \Delta\theta^{BA} + \Delta\theta^{BB} \tag{4.8}$$

or:

$$\left(\bar{\beta}_1^B - \bar{\beta}_1^A\right)\left[\theta^{AB} + \Delta\theta^{AA} + \Delta\theta^{AB}\right] + \bar{\beta}_1^B\Delta b^B + \bar{\beta}_1^A\Delta b^A - \bar{\beta}_1^B\Delta\theta \tag{4.9}$$

Dividing this by $\bar{\beta}_1^B$, we can compare this with the pure efficiency effect in 4.3. If the B community is underprivileged in the eyes of the planner, the first term will be positive due to the added taxes. The second term will not change and the third term, which is negative, is smaller in absolute value. Finally the last term does not change. That is, in comparison to the pure efficiency case, we have an argument for more extensive rights for the B community. The introduction of the right can in part compensate for the underdog situation of the B community.

However, comparing it to the static case in this section, equation 4.6, the result is not so clear. The first term is bigger due to the distributional effects of the tax increase. Also the second and third terms taken together would add a positive contribution if the average propensities to pay for the right is comparable in the two communities, or if the increase in the average propensity to pay in the B community is big enough. These positive effects, however have to be compared to the negative effect of the tax increase due to the concave cost structure.

4.2.2 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, $\bar{\beta}^A$, 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 are both a direct and a distribution effect. The direct effect is:

$$\Delta\bar{\beta}^A\left(b^A - \theta^A\right) - \left(\Delta\bar{\beta}^B - \Delta\bar{\beta}^A\right)\theta^{BA} \tag{4.10}$$

We can rewrite this expression as:

$$\Delta\bar{\beta}^A\left(b^A - \theta^{AA}\right) - \Delta\bar{\beta}^B\theta^{BA} \tag{4.11}$$

With a linear approximation of the β functions, $\Delta\bar{\beta}^A$will have the sign $\theta^{AB} + \Delta\theta^{AA} + \Delta\theta^{AB}$, which – even if $\Delta\theta^{AA}$ is negative – can safely be assumed to be positive, and $-\Delta\bar{\beta}^B$ will have the sign of $b^B + \Delta b^B - \theta^{BB} - \Delta\theta^{BB} - \Delta\theta^{BA}$, which reduces to $\theta^{AB} - \Delta\theta^{BA} + \Delta b^B - \Delta\theta^{BB}$ if the *ex ante* cost-benefit criterion is marginally satisfied. Since the second term is non-negative and the third term contains – in addition to the increase in the B community – an increase in the average propensities to pay (which carries

no costs), we can safely assume $-\Delta\bar{\beta}^B$ to be positive, too. That is, the income effect is an argument for a more liberal policy in favor of the B community.

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.

Hence, the direct income effect is an argument for more extensive rights for the B community than what is implied by the *ex ante* cost-benefit analysis.

The indirect effect of the income effect on the distribution is treated below.

4.2.3 Direct distribution effects within the communities

There are distribution effects due to the propensities to pay as well as the taxation. We first look at the direct effects caused by the taxation:

$$\begin{aligned} &-\bar{\beta}_1^A\theta^{AB}V_\theta^{AB}-\bar{\beta}_1^B\theta^{BB}V_\theta^{BB} \\ &-\bar{\beta}_1^A\left[\Delta\theta^{AB}V_\theta^{AB}+\Delta\theta^{AA}V_\theta^{AA}\right] \\ &-\bar{\beta}_1^B\left[\Delta\theta^{BB}V_\theta^{BB}+\Delta\theta^{BA}V_\theta^{BA}\right] \end{aligned} \tag{4.12}$$

This can be rewritten as:

$$\begin{aligned} &-\bar{\beta}_1^A\left[\left(\theta^{AB}+\Delta\theta^{AB}\right)V_\theta^{AB}+\Delta\theta^{AA}V_\theta^{AA}\right] \\ &-\bar{\beta}_1^B\left[\left(\theta^{BB}+\Delta\theta^{BB}\right)V_\theta^{BB}+\Delta\theta^{BA}V_\theta^{BA}\right] \end{aligned} \tag{4.13}$$

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 both 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, and a negative effect caused by the dynamic effect, reducing the size of the A community and the taxes paid for the rights in the A community.

If the V_θ's are identical within each community, we find:

$$\begin{aligned} &-\bar{\beta}_1^A\left[\theta^{AB}+\Delta\theta^{AB}+\Delta\theta^{AA}\right]V_\theta^A \\ &-\bar{\beta}_1^B\left[\theta^{BB}+\Delta\theta^{BB}+\Delta\theta^{BA}\right]V_\theta^B \end{aligned} \tag{4.14}$$

Since the total fiscal effect is a tax increase, the net effect will be positive if taxes are not earmarked. If all V_θ's and the $\bar{\beta}_1$'s are equal,.we find:

$$-\bar{\beta}_1\left[\theta^{AB}+\theta^{BB}+\Delta\theta^{AB}+\Delta\theta^{AA}+\Delta\theta^{BB}+\Delta\theta^{BA}\right]V_\theta \tag{4.15}$$

or

$$-\bar{\beta}_1\left[\theta^B+\Delta\theta\right]V_\theta \tag{4.16}$$

Hence, the distributional fiscal effect is positive due to the tax increase (as in any public project leading to a tax increase if taxes are positively correlated with income): This is then an argument for more extensive rights to the minority language than what is implied by the *ex ante* cost-benefit analysis.

The effect due to the propensities to pay for the language rights is given by:

$$\bar{\beta}_1^A\Delta b^A V_b^A+\bar{\beta}_1^B\left(b^B+\Delta b^B\right)V_b^B \tag{4.17}$$

The sign of the V_b^L's depends on whether the language right is an inferior or normal good. One can find arguments for both assumptions. If the majority language is an elite language not mastered by the

masses, it is reasonable to assume that the propensities to pay for the rights of the minority language are decreasing in income and V_b^B is positive. If the practical aspect of the right is not to important and it is more a matter of principle for the speakers of the B language to have the right, it is reasonable to assume that the propensities to pay increase with income and the V's are negative. Since $\Delta b^A = \bar{b}^A \Delta n^A$ is negative and $b^B + \Delta b^B$ is positive, we potentially have two effects of different signs, but under any reasonable assumption the second term will be dominant.

Hence, the effect will be positive if the demand for language rights has a negative income elasticity, that is, if they are an inferior good, giving us an argument for more extensive rights for the minority. If the income elasticity is positive, that effect is an argument for less extensive rights.

4.2.4 Distribution effects within the communities due to the income effect

The effect is given by:

$$\Delta\bar{\beta}^A \left[b^A V_b^{\Delta\beta A} - \theta^{AA} V_\theta^{\Delta\beta AA} \right] - \Delta\bar{\beta}^B \theta^{BA} V_\theta^{\Delta\beta BA} \tag{4.18}$$

The changes in the β's, $\Delta\beta^i = \beta_1^i - \beta_0^i$ are given by:

$$\Delta\beta^i = \beta\left(\omega^i, b^{iA} + b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) - \beta\left(\omega^i, b^{iA} - \theta^{iA}\right) \tag{4.19}$$

for $i \in N^A$, this becomes to a first approximation:

$$\begin{aligned} \Delta\beta^i &= \beta\left(\omega^i, b^{iA} + b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) - \beta\left(\omega^i, b^{iA} - \theta^{iA}\right) \\ &\doteq -\frac{\partial\beta\left(\omega^i + b^{iA} - \theta^{iA}, 0\right)}{\partial a^i}\left[\theta^{iB} + \Delta\theta^{iB} + \Delta\theta^{iA}\right] > 0 \end{aligned} \tag{4.20}$$

and for $i \in N^B$ we find:

$$\begin{aligned} \Delta\beta^i &= \beta\left(\omega^i, b^{iA} + b^{iB} + \Delta b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}\right) - \beta\left(\omega^i, b^{iA} - \theta^{iA}\right) \\ &\doteq \frac{\partial\beta\left(\omega^i - \theta^{iA}, 0\right)}{\partial a^i}\left[b^{iB} + \Delta b^{iB} - \theta^{iB} - \Delta\theta^{iB} - \Delta\theta^{iA}\right] \\ &= -\frac{\partial\beta\left(\omega^i - \theta^{iA}, 0\right)}{\partial a^i}\left[\theta^{iB} + \Delta\theta^{iB} + \Delta\theta^{iA}\right] + \frac{\partial\beta\left(\omega^i - \theta^{iA}, 0\right)}{\partial a^i}\left[b^{iB} + \Delta b^{iB}\right] \end{aligned} \tag{4.21}$$

The correlation of the $\Delta\beta$'s with income is critically dependent of the planer's preferences. In general, if the planer wants to redistribute to the weak, we would expect that at least for very low and very high incomes, the derivatives decrease in absolute values with increasing income. The factors in the square brackets, however, can be expected to increase in the case of an A individual and possibly change sign for a B individual, if language rights are an inferior good. That is, we can not in general determine if the $\Delta\beta$'s increase or decrease in income. If language rights are a normal good, the square bracket might stay positive and vary very little with income. In this case the weights $\Delta\beta$ might be negative for B individuals. That is, we can expect the $V_\theta^{\Delta\beta LM}$'s to be smaller in absolute value than the corresponding V_θ^{LM}'s or even positive. This could add both a positive as well as a negative term to the welfare and be an argument for or against more extensive rights for language B than what is implied by the *ex ante* cost-benefit analysis.

For the effect due to $V_b^{\Delta\beta A}$, of course, the same applies.

4.3 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.

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

Table 1: Different welfare effects of the realization of minority rights in addition to *ex ante* net benefits

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.

If the minority community is poorer than the majority, the introduction of the right with its associated fiscal externalites on the majority provides arguments for more extensive rights for 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. The first effect is the standard result in optimal-taxation analysis with a fixed tax revenue; here we have to compare it with the distribution effects of the benefit side, too.

In table 1 these effects are summarized.

5 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.

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