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Abstract

Distributions of language rights in multilingual settings are analyzed from a normative viewpoint in this chapter. If the cost structure of providing rights is concave in the number of beneficiaries, then a critical-mass criterion for the determination of an optimal rights structure results. It is further shown that an efficiency analysis based on a 'naive' cost-benefit calculation has to be augmented in various ways if rights influence the status of a language, which in turn influences the preferences for language rights. Also the inter-generational transfer of language repertoires to the next generation leads to an endogeneity of preferences. The endogeneity of preferences in turn can make the cost-benefit analysis contradictory. In a welfare-maximizing approach, redistribution goals further modify the analysis.

JEL-Code: D610, D630, H590, K190, Z190.

Keywords: efficiency, cost-benefit analysis, economic justice, changeable preferences, language rights, linguistic justice, language policy.

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1 Introduction

Different normative approaches to status and acquisition planning and language rights have been analyzed by a number of scholars from the point of view of law, political science, philosophy, sociology, and economics.¹ In this essay, though we present a stringent analytic approach based on welfare-economics theory, it does not mean that we are rejecting other approaches. On the contrary, language rights is such a multifaceted phenomenon that many approaches are indeed needed, and they can fertilize one another, laying bare the weak points of one or another point of view.

1.1 Economics analysis

What distinguishes an economics analysis is first and foremost what is known as methodological individualism. That is, individual preferences and individual behaviors are cornerstones of societal phenomena analysis. Individual behavior is taken as the smallest building block of society and can be aggregated to describe collective behavior. This holds true for both a descriptive, positive analysis and for a prescriptive, normative analysis.

Subjective, individual evaluations serve as the basis for societal evaluations. Applying this, however, we encounter several problems, especially in the discussion of distributional issues. There is a wealth of literature discussing problems of preference aggregation.² Although allocation efficiency and Pareto efficiency are well-defined, applying them to, for instance, cost-benefit analysis is not without methodological problems. This is especially due to income effects, the so-called Scitovsky paradox, which in many cases leads to path dependencies.³ Another practical problem is how to observe and measure individual evaluations. In a market, these subjective evaluations will be reflected in observed demand (and supply) behavior and equilibrium prices.⁴ In the absence of a market, the issue becomes much more difficult, and the revelation of individual preferences is associated with many incentive problems. For the purpose of this chapter, we will ignore these latter difficulties.⁵

Efficiency analysis as a rule takes preferences and behavioral patterns as given stationary characteristics defining individuals. When it comes to individual preferences for language use, this is not a simple matter. Even in the short run, one might not be justified in treating the linguistic preferences of individuals as constant and given. The language repertory and, hence, the preferences of young individuals are determined by their surroundings. These surroundings can change over the lifetime of the individual as a result of language policy, among other things. In other words, the changing linguistic environment

¹A good overview of the current discussion can, for instance, be found in the volume *Language Rights and Political Theory* edited by KYMLICKA and PATTEN (2003) or, from a political-science perspective, in a recent special issue of *Language Policy*; see especially the introduction by PELED, IVES, and RICENTO (2014).

²This is not the place to review such literature, which goes back as far as the French Revolution and proceeds through the modern revival associated with the work of scholars like ARROW (1951).

³For the original contribution, see SCITOVSKY (1941).

⁴Individuals with a free choice of what to consume will compare their subjective evaluation of the value of a good with its market price. They will only purchase a good with a price that is lower than the subjective value attributed to the good. Hence, through their behavior in the market, individuals reveal their preferences for the good in question.

⁵This is an empirical measurement problem without importance for our normative analysis.

might affect the individual preferences for language use and individual preferences are not static. Consequently the basis of the evaluation is no longer exogenous. In the treatment of several generations, this problem becomes more important. Even if individual preferences were to be static over the lifetime of the individual, the preferences of new young individuals would be formed at least partially by their surroundings when they enter society. If these surroundings were to change with time, each new cohort would have different preferences, and the distribution of preferences would change over time. This could lead to path dependencies and multiple solutions.⁶

1.2 Methodological overview

In this chapter, traditional welfare analysis will be made operational by cost-benefit analysis modified to fit the special character of language rights. We will also discuss distributional implications, taking the normative basis for the comparison of individual welfare to be exogenous in the form of preferences of an imaginary planner; see below.

There are a number of investigations based on cost-benefit reasoning. POOL (1991) or LO JACOMO (1989), for instance, address the question of learning or translation costs due to, among other things, status planning. Ginsburgh and Weber and various coauthors compare the disenfranchisement effect on speakers of different unofficial languages under various status-planning regimes in the European Union with associated administrative costs.⁷ Generally, these contributions do not attempt to model the value individuals attribute to language rights in any detail, a central point in this essay.

1.2.1 Value of language

Language is certainly the most important means of communication in all human societies. Language is also one of the most important aspects of an individual's personality, as well as of his or her social and cultural identity. These two aspects of language often find themselves in conflict with one another.

The practicality of a language certainly increases with the number of speakers; hence, if only communication counts, it would be efficient to have only one language. Opportunities in the labor market, for example, might be the most important argument for being socialized into the majority language of a country. However, being a speaker of a minority language does not exclude a working knowledge of another dominant one. Hence, this argument might not be as strong as one might think at first.⁸

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, as noted above. We can here distinguish between changes within a generation and between generations.

⁶This is discussed in WICKSTRÖM (2013).

⁷See, for instance, FIDRMUC and GINSBURGH (2007), GINSBURGH, ORTUÑO-ORTÍN, and WEBER (2005), as well as GINSBURGH and WEBER (2005). GAZZOLA (2006) and GAZZOLA (2014c) also fit into this tradition.

⁸DRINKWATER and O'LEARY (1997) and RENDON (2007) provide some evidence that being a minority speaker might not be a disadvantage at all.

Individuals can over their lifespans alter their language or acquire additional idioms. However, the more important aspect is the change between generations. All new-born individuals are endowed with their own characteristics, defining them as individuals. These characteristics are, at least partially, determined by the preferences of the previous generation as well as the linguistic environment the individual is born into. The normative evaluation of this environment is also determined by the preferences of the individuals of the previous two generations.⁹ The preferences transmitted to the new cohorts have a direct effect on the aggregated distribution of preferences during the lifetime of individuals of the parental generation and, hence, on the determinants of the welfare analysis during their lifetime. But they also influence the composition of preferences of subsequent generations. That is, the language policy at any given time influences the composition of preferences at subsequent times, thereby causing various path dependencies.¹⁰

1.2.2 Status

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 possibility of using the language in various social arenas. Status planning is concerned with the issue of defining the official status of languages. This can be made operational in defining the legal rights of speakers of a certain language in different domains. Such domains typically include various public offices, public education at different levels, public information such as street names or law and regulation texts.

Whether a language receives 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.¹¹ 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.¹²

⁹For the sake of simplicity, it is assumed in this essay that only two generations overlap at any one time.

¹⁰The general structure of our analysis is also supported by the observed fact that drastic changes in language use occur between generations, where language shift typically happens over three consecutive generations: the members of one generation are monolingual, their children grow up bilingual and their grandchildren are monolingual in the second language.

¹¹The administrative division can also be used to reduce the influence of an ethnic minority. Compare the situation in Slovakia, where there is a large ethnic and linguistic Hungarian minority living on the north shore of the Danube. The arrangement of the districts (*okresy*), mostly extending from the Danube far into the north, however, is such that there are only two (of eleven) districts bordering the Danube with a Hungarian majority (Komárno/Komárom and Dunajská Streda/Dunaszerdahely). A minor rearrangement of the eleven districts with five or six southern and five or six northern ones would create southern districts with a clear Hungarian majority and would in no other respect alter the administrative structure. Similarly, a southern region (*kraj*) with a large ethnic Hungarian majority could be set up. This would be in accordance with the economic theory of federalism (see BOADWAY and SHAH (2009)) and, of course, considerably increase the status of the large Hungarian minority.

¹²See, however, the chapter by Uriarte Ayo in this volume for an analysis of language rights from the point of view of positive economics.

1.2.3 Normative basis

Our goal is to search for acceptable allocations of rights according to a certain ethical 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 looked for, or the desired allocation of rights may be governed by maximization of some (paternalistic) welfare function. The first approach is basically a cost-benefit analysis. A crucial assumption here is the definition of the point of reference, the *status quo*. Different choices can lead to different conclusions. We discuss this in some detail in WICKSTRÖM (2007).

A welfare function is seen as a representation of the preferences of a social planner, which gives the problem a consistent frame within which the analysis can be carried out. Individual utility functions are seen as functions of the incomes of the individuals.¹³ The welfare function is in turn an increasing function in these individual utilities.¹⁴ The social planner's preferences for redistribution are represented by the marginal welfare changes due to small (real or implicit) income change for the various individuals.¹⁵

In the discussion of distributional aspects of language planning, we primarily discuss how the desire to redistribute alters the simple cost-benefit analysis. Although dynamic effects are considered, 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 considerations that alter the analysis in different ways. First, we deal with discrete changes, which imply that there are discrete jumps in implicit incomes and hence in the marginal evaluations of the social value of income redistribution. Second, individual preferences can be endogenous. Third, there are also long-run endogenous dynamic effects altering the composition and distribution of individual preferences of the population.

1.3 A *vademecum* through the rest of the chapter

In order to make the analysis tractable, we need limit the scope of the analysis and introduce a certain amount of formal modeling. This is done in Section 2. Here the basic concepts are introduced, and the three main variables in our cost-benefit analysis are formally defined: the individual propensities to pay, the costs of different allocations of language rights, and the preferences of the social planner. We set up and analyze a benchmark case, which is used as the reference point in further analysis. One robust result emerging from the benchmark case is that the absolute (and not the relative) size of a minority should be an input into the decision criterion for introducing minority-language rights.

In Sections 3 and 4, we argue that the benchmark case has to be augmented if the cost-benefit approach should be used as a policy tool and that in some cases the welfare analysis actually fails to produce clear recommendations. Section 3 analyzes the consequences of individual preferences being endogenous. We show that this leads to different external

¹³More precisely, indirect utility functions and implicit incomes.

¹⁴That is, it is Paretian.

¹⁵Note that we are not attributing any 'deeper' significance to the welfare function in the sense of social-choice theory. Here it is only a representation of the preferences of a social planner for income (re)distributions. The only axioms implied are that it should respect Pareto efficiency and anonymity (see below). The second axiom simply says that individuals are only characterized by their implicit incomes, and two individuals with the same implicit income are treated identically.

effects which have to be incorporated into the cost-benefit calculations, and that in many cases these externalities produce contradictory results making the cost-benefit analysis impotent as a tool for policy evaluation. Section 4 looks at the distributional effects of the introduction of language rights. There are distributional effects both between and within language communities and the distributional consequences of language rights are strongly dependent on the domain considered.

In the Appendix, the informal verbal discussion in the main part of the chapter is formalized in a more stringent analysis of two language groups and a single language right.

2 Basic model

In this section we set up a formal framework and a benchmark model for the analysis of language rights. The basic structure and notation closely follow that of WICKSTRÖM (2013).

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 .¹⁶ The number of individuals of cohort t in language 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

The actual use of a language is an individual matter, benefiting the individual using it.¹⁷ Whether a person chooses to use a certain language or not in a given situation will, to a large extent, depend upon the constraints she 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

¹⁶For 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 notation considerably and does not detract from the principal points of the analysis.

¹⁷Of course, one person's use of a language might very well affect the well-being of the person she is talking to, or might want to communicate with, producing external effects, be it positive or negative ones. The larger the number of speakers of a language, the greater the potential number of contacts and, hence, the benefit of the language to all persons 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 Uriarte Ayo in this volume, among others, as well as in SELTEN and POOL (1991), CHURCH and KING (1993), GABSZEWICZ, GINSBURGH, and WEBER (2011), and 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 speakers of minority languages are analyzed. The present analysis treats this external 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.

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 exclude the right to use another language in the same setting *per se*: 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. Here we are focusing on these legal rights and not on the many other possibilities for using a language outside of the public sector. In a comprehensive analysis of language rights and justice, these aspects would have to be taken into account.¹⁸

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 $r_t^{ld} = 0$. Such a matrix defines a language regime, specifying which languages are accorded legal rights in which domains.¹⁹

Often, for practical or other reasons, not all possible allocations of rights are considered, but only certain subsets. Some domains are combined and different categories are defined. For instance, the category 'official status domains' might include important documents and symbolic uses, such as street names. The category 'working-language domains' would include negotiations and certain meetings. The object of analysis is then the allocation of languages to such categories.²⁰ The fact that in many cases only one category is used – a language either has an official status or it has no status at all – seems unnecessarily restrictive. An optimal system with several categories would improve welfare. If there were no costs in administering a system with very differentiated language rights, the highest degree of differentiation would be optimal.²¹ However, due to the administrative costs, the optimal number of categories would be less, but almost certainly greater than one.

¹⁸For more general analyses in this direction, the reader is referred to KYMLICKA and PATTEN (2003) or PATTEN (2009) and the references therein. For a more formal analysis, see also VAN 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).

¹⁹In the European Union, for instance, at the moment 24 languages l are accorded rights in such domains d as legal documents or the European Parliament. For those languages the r^{ld} 's are equal to one at the moment. For some other big languages spoken in the European Union, notably Catalan and Russian, the corresponding r^{ld} 's are equal to zero. If a four-language regime (English, French, German and Polish, for instance) were to be introduced, for those languages the corresponding r^{ld} 's would remain equal to one, whereas for all other languages they would be equal to zero. This describes the idea of language regimes in GINSBURGH and WEBER (2005) and the many subsequent articles by the same authors with various coauthors. The definition of r is, however, more general in that it distinguishes various domains, where Ginsburgh and Weber only consider one domain, see below.

²⁰In the EU and in all EU organs, all 24 languages have an official status, but in many organs the number of working languages is drastically reduced. The European Central Bank has only English as its working language, but all 24 languages are official, as can be seen on the Euro bank notes, where the abbreviation ECB is given in all official languages. Similarly, the Court of Justice uses only French as its working language. One could, hence, imagine a European Parliament with a high number of official languages and a commission with only a few. This corresponds closely to the current practice.

²¹This is just an application of Le Chatelier's principle.

2.3 Endogeneity of preferences, language status, and propensities to pay

Preferences are endogenous in two ways. First, by giving their mother tongue(s) to their offspring, members of the parental generation influence the preferences for different language regimes in society by influencing the number of speakers. We model this as (among other things) a function of the status the language enjoys when the parents make their decision. The higher the status of a 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. In this model, the intensity of a given individual's preferences for giving rights to a language depends on the social status of that language.

By relating the status of a language to the formal rights granted to the use of the language, we introduce a feed-back mechanism into the system.²² The feedback mechanism introduces path dependencies; thus there is no guarantee that the optimal policy is stable. Indeed, cyclical societal preferences are a possibility; see Section 3.1.1.

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 point of departure is that there are in effect no rights at all and the second signifies that the point of departure is the existence of all possible rights in all domains for all languages.

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.²³ For the purposes of this essay, we will assume the former: $b^i(\mathbb{O})$ is set equal to 0 for all i .

A rights allocation – the entitlement to the use of certain languages in certain situations – can for our purposes be looked upon as a non-rival good. The ‘demand’ or propensity to pay for this good will vary according to the individual. The sum of all individual propensities to pay will then give society's total propensity to pay for this specific rights allocation. A difference from the textbook 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. The preferences are defined over bundles of individual rights and the availability of other language rights will enter the demand for any specific right to use a certain language. A Swede's propensity to pay for Swedish as an official language, or that of a Pole might depend on the availability of Danish or Czech, respectively, since the corresponding pair of languages are more or less mutu-

²²The structure could easily be adopted to deal with questions related to various forms of education. The members of the parental generation decide on the education given to the members of the next generation, which in turn influences their preferences for educating their children, etc. This process can lead to very different societies in the long run equilibria.

²³For a further discussion of the choice of *status quo* the reader is referred to WICKSTRÖM (2007). The idea set forth in Van Parijs (2011) uses universal rights as a point of departure and then requires the English speakers to compensate all others for accepting English as *lingua franca*.

ally comprehensible.²⁴ Mutual comprehensibility²⁵ is not the whole story, however, for the identity-defining function of language pulls in other directions.²⁶

2.4 Costs of different rights regimes

Let $c(r, n)$ be the costs that the realization of the rights allocation r causes society in comparison to the *status quo*. The function c is assumed to be concave in n^l if $r^{ld} = 1$ for some d .²⁷ The concavity implies that the cost per beneficiary is decreasing or constant for the linear case.

2.5 Cost-benefit analysis and efficiency

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

$$b(r) = \sum_{i \in N} b^i(r). \quad (2.1)$$

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

$$\sum_{i \in N} b^i(r) > c(r, n). \quad (2.2)$$

By introducing payments (or taxes), θ^i , we can reformulate this slightly differently. The sum of the payments exactly covers the costs of introducing the rights if the following equation holds:

²⁴This point can be partially operationalized as the ‘linguistic distance’ between languages. See, for instance, the analysis in GINSBURGH, ORTUÑO-ORTÍN, and WEBER (2005), FIDRMUC, GINSBURGH, and WEBER (2005), or Ginsburgh and Weber in this book.

²⁵The importance of linguistic distance is not self-evident, however, and depends on language policy. Today young Swedes and Danes tend to interrelate in (American) English, a situation that can only be characterized as absurd by a native Swede getting his basic education in the 1950’s. However, this is an externality induced by acquisition planning that almost exclusively concentrates on English, coupled with the strong dominance of a certain popular culture as well as the economic and military power behind the language. A very small effort spent on learning the neighbor language would have a pay-off that by far exceeds the costs, a case where *ex post* optimality does not enter the *ex ante* calculations, due to the reduced practical distance between Swedish or Danish on the one side, and English on the other side, induced by the educational system.

²⁶The importance of emotional attachment to language is reflected in, for example, Wales, where virtually every Welsh-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 for the respective language seems to be considerable among its speakers.

²⁷In 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 at all, involving only fixed costs, whereas the provision of elementary education is more or less proportional to the number of beneficiaries.

$$\sum_{i \in N} \theta^i = c(r, n) \quad (2.3)$$

If θ satisfies equation 2.3, we say that it is in the set $\Theta^F(r, n)$. The net benefit to individual i of the allocation of rights r in comparison to the *status quo* is given by $\Delta a^i(r, \theta^i) := b^i(r) - \theta^i$. A necessary and sufficient condition that the allocation be a Pareto improvement (or Pareto equivalent), is that all Δa 's be non-negative:

$$\Delta a^i(r, \theta^i) \geq 0 \quad \forall i \quad (2.4)$$

Ignoring distributional aspects, we can define a potential Pareto improvement by

$$\sum_{i \in N} \Delta a^i(r, \theta^i) > 0 \text{ for } \theta \in \Theta^F(r, n). \quad (2.5)$$

The Pareto-efficient allocations can be found by maximizing the sum of the net benefits over all possible allocations of rights subject to the feasibility constraint 2.3:

$$\max_r \sum_{i \in N} \Delta a^i(r, \theta^i) \text{ for } \theta \in \Theta^F(r, n) \quad (2.6)$$

The program 2.6 can also be written as

$$\max_r \left[\sum_{i \in N} b^i(r) - c(r, n) \right]. \quad (2.7)$$

This is our benchmark case, the 'naive' cost-benefit analysis.

If taxes are flexible, we can find a first-best Pareto-efficient allocation satisfying the solution to 2.6 which is also a Pareto improvement on the *status quo*, satisfying 2.4.

This can be modified in two ways. First, not all tax structures are possible; specifically, the first-best case is not institutionally feasible. This necessitates a second-best analysis of the optimal language rights with $\theta \in \Theta^I(r, n)$, the set of institutionally feasible taxes. Second, the social planner has preferences over distributions of incomes, postulating trade-offs between efficiency and more egalitarian distributions. The welfare function is more general than the (sum of) net individual benefits, and problem 2.6 becomes a special case of the welfare analysis.

2.6 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 :

$$U^i = u^i(\omega^i + \Delta a^i) \quad (2.8)$$

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

$$W = w(U^1, \dots, U^n) \quad (2.9)$$

We assume the welfare function to be Paretian, that is, increasing in each U^i . The change in welfare, ΔW , due to a (discrete) change in a , Δa , can be written as:

$$\Delta W = \sum_i \frac{\Delta w}{\Delta U^i} \frac{\Delta u^i}{\Delta a^i} \Delta a^i =: \sum_i \beta^i \Delta a^i \quad (2.10)$$

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 $\omega^i + \Delta a^i$.²⁸ 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 $\beta^i(\omega^i, \Delta a^i)$ are identical and can be written as $\beta(\omega^i, \Delta a^i)$. In this essay, this is the case.

In looking at the long-run changes in W , we can 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.

2.7 Optimal language rights

The problem of defining optimal language rights can now be written as:

$$\max_{r, \theta} \Delta W = \max_{r, \theta} \sum_{i \in N} \beta(\omega^i, \Delta a^i) \Delta a^i, \text{ subject to } \theta \in \Theta^I(r, n) \cap \Theta^F(r, n) \quad (2.11)$$

If the planner is only interested in efficiency, the β 's are all equal and constant and the problem is reduced to our benchmark case 2.7.

Since the cost function is assumed to be concave in the number of individuals benefiting from a rights allocation, the costs *per capita* decrease in the number of beneficiaries, as already noted above in Section 2.4. Hence, by any rights structure where the average propensities to pay are independent of the number of individuals, we can, independent of the planner's policy preferences, conclude that for every rights allocation there will be a critical number of individuals determining whether the rights should be realized or not. If c is linear in n (for instance, schools), the critical mass goes from zero to infinite, as the *per capita* propensities for payment increase. Then, a different treatment of different language groups can only be motivated by different *per capita* propensities to pay in the different groups.

Policy conclusion

For any rights allocation, the welfare-optimal decision criterion is characterized by a critical mass of beneficiaries. If the number of beneficiaries is below the critical mass, the rights should not be realized; if it is above the critical mass, they should be realized.²⁹

²⁸Of 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.

²⁹In reality, the condition for giving rights to minorities is often given as a fraction of the population. In Romania or Slovakia, for instance, the minority has to make up 20% or 15%, respectively, in order to have a claim on certain rights for their language. In Finland, there is a percentage rule (8%), but also a critical-mass

3 Modifications due to endogenous preferences

There are two types of modifications to the ‘naive’ condition 2.7 to be considered. In the analysis of efficient rights, there are a number of external effects due to the endogeneity of the preferences, which are treated in this section. Additionally there are distributional considerations, which shall be discussed in Section 4.

3.1 Changes in individual preferences (status effect)

There is a possible change in the 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 from what it was before the introduction if the implementation of the right increases the status of the language, making the speakers evaluate the rights more positively.³⁰

Policy conclusion

The introduction of a right for a language l in a certain domain carries a positive externality if the introduction of the right increases the status of the language, making the users prouder, thereby increasing their propensity to pay. The policy conclusion is that the ‘naive’ analysis underestimates the efficient extent of language rights and consequently overestimates the size of the critical mass.

3.1.1 A ‘paradox’

The status effect also works in the opposite direction when rights are reduced. A reduction in rights reduces the status of the language and this reduction causes a decline in the propensity to pay for the right. In certain cases, this makes the cost-benefit analysis impotent. We can illustrate this with two simple examples.

Let r be an allocation of rights for a minority language and c the associated costs. The aggregated propensity to pay for this rights allocation is in *status quo* b_0 and after the rights have been introduced b_1 , $b_1 > c > b_0$. The external effect is $b_1 - b_0$. It is clear that since $b_1 > c > b_0$, after the introduction of the rights, the cost-benefit allocation gives a positive result; benefits b_1 exceed costs c . However, we can now ask if it pays to remove this rights allocation. Also here the answer is clear: the cost-benefit analysis concludes that the rights are to be removed. The savings c exceed the benefits b_0 of having the rights.

This corresponds to the Scitovsky paradox,³¹ whose cause lies in an income effect that causes a change in the propensity to pay by stationary preferences. Due to a change in the

criterion of 3000 individuals. Rights are granted if either condition is fulfilled. Both criteria are, of course, easily manipulable through changes in the administrative units; by redrawing borders between administrative units, making them larger, one can often easily remove the basis for the minority rights if the percentage criterion is in effect. This is, of course, not possible with a critical-mass criterion. On the other hand, dividing jurisdictions could reduce the rights in local jurisdictions in the case of the critical-mass criterion. With the division of jurisdictions, using the percentage criterion, at least one part will get a higher percentage of the minority than the original jurisdiction. Based on this discussion, using a territorial principle, one could develop a theory of optimal jurisdictions, which goes beyond this essay, but compare footnote 11.

³⁰CLOTS-FIGUERAS and MASELLA (2013) provide evidence for such an effect in Catalonia.

³¹See SCITOVSKY (1941).

environment, the individual senses a change in implicit income and the *ex post* propensity to pay differs from the *ex ante* one. Here, the effect comes from the presence or absence of certain rights.

The inconclusiveness of the cost-benefit analysis can be more complex, as illustrated in the following. Let there be three possible rights allocations, the *status quo* r_0 as well as r_I and r_{II} with associated costs c_I and c_{II} , $c_I < c_{II}$. The second allocation is more extensive than the first one. The propensity to pay for the two allocations is in the *status quo* b_I^0 and b_{II}^0 , $c_I < b_I^0 < b_{II}^0 < c_{II}$. If r_I is realized, the propensities to pay are b_I^1 and b_{II}^1 with $c_I < b_I^1 < c_{II} < b_{II}^1$ and $c_{II} - c_I < b_{II}^1 - b_I^1$. A cycle is also present here since r_0 cannot be compared to r_{II} by the argument above. However, if only gradual comparisons are possible, the cost-benefit analysis gives a clear result. It first tells us to choose r_I , but due to the externality, once r_I has been chosen, it leads us to choose r_{II} .

The basic problem then, is that the cost-benefit analysis cannot handle preference changes in a satisfactory manner. Even without taking the preference externality into account, but evaluating the situation with the preferences at hand, in the first example we have two very different allocations that are both efficient by the given preferences. In the second example, the externality is partially taken into account in a straight-forward manner and we have only one efficient allocation when the evaluation occurs with the preferences at hand.

3.2 Changes in the size of language groups

It is assumed that the rights for language l in effect at period t influence the status of that language in that period and, hence, the parent generation's choice of language(s) for the next generation, the size of n_{t+1}^l .³² In other words, we assume that parents in bringing up their children, decide to socialize them into their own language or another (majority) language depending, on the one hand, on the status of their own language compared to the alternative language(s) – the emotional, cultural aspect – as well as, on the other hand, the number of speakers – the practical, communicative aspect. Hence, the distribution of the individuals on 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.³³ The distribution of the next cohort on the language groups is assumed to be given by a function g , such that

$$n_{t+1}^l = g^l(r_t, n_t^0), \quad (3.1)$$

³²The long-run effects of certain allocations of language rights would be part of the 'emotional' aspect of determining the propensity to pay. The designation of certain languages as 'official' in given domains gives them a higher status, which reduces incentives for following generations to use the unofficial 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 unofficial 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 unofficial languages. For a further analysis of this possibility, see ABRAMS and STROGATZ (2003), MINETT and WANG (2008), or WICKSTRÖM (2005).

³³Compare CENOZ (2008) who cites statistics showing the use of the Basque language in Spain and France. The policy in Spain is very supportive of Basque and its number of speakers is increasing. In France Basque enjoys fewer rights and the number of speakers is diminishing.

with g^l non-decreasing in n^l and in a further right to language l .³⁴ The language-group dynamics of the population is then given by

$$\dot{n}_{t+1}^l := n_{t+1}^l - n_t^l = g^l(r_t, n_t^0) - n_t^l. \quad (3.3)$$

3.2.1 Steady state

By setting $\dot{n}_{t+1}^l = 0$ for all l , we (generally) find different steady-state sizes of the language groups for different allocations of rights in society.³⁵ The introduction of more extensive rights for one community increases the size of that community. If the total size of the population is constant, the size of other communities will decrease. Since the cost function is concave in n , the *per capita* costs of language rights in the first community will decrease and increase in the other communities. There is a positive externality in the first community and a negative one in the other communities. If the first community is smaller than the others, the net effect will be an increase in overall *per capita* costs. Hence, in the efficiency analysis the conclusions have to be modified.³⁶

Contradictory results similar to those we found in Section 3.1.1 can also occur due to the change in the size of the language communities: Let b^0 and b^1 , $b^0 \leq b^1$, be the average propensity to pay for a certain right in its absence (State 0) and presence (State 1), respectively. If n^0 and n^1 , $n^0 < n^1$, are the steady-state sizes of the community in the two states and c the cost to society of introducing the right, then we cannot exclude that $b^0 n^0 < c < b^1 n^1$. The first part of the inequality tells us not to introduce the right if it is absent and the second part that the right should not be abolished if it is in effect. In this case, the cost-benefit analysis fails to provide us with a policy recommendation.

Policy conclusion

The introduction of a right for a language l in a certain domain carries a positive externality, increasing the aggregated propensity to pay for further rights for that language through an increase in the size of its community. The policy conclusion is that the ‘naive’ analysis underestimates the efficient extent of language rights and overestimates the size of the critical mass. However, the introduction of a right also carries a negative externality, de-

³⁴Formally, letting \bar{r}_t and \hat{r}_t be some allocations of language rights,

$$g^l(\bar{r}_t, n_t^0) - g^l(\hat{r}_t, n_t^0) \geq 0, \text{ if } \begin{cases} \bar{r}_t^{md} - \hat{r}_t^{md} = 0 \text{ for all } d \text{ and all } m \neq l \\ \bar{r}_t^d - \hat{r}_t^d = 1 \text{ for some } d \end{cases} \quad (3.2)$$

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

where n_t^0 is the vector of all n_t^l .

³⁵Let \bar{r} and \hat{r} be two such allocations giving the same rights to all languages except l and with \bar{r} providing more extensive rights for l than \hat{r} in some domain(s). Then:

$$n^l(\bar{r}) = g^l(\bar{r}, n^0(\bar{r})) \geq g^l(\hat{r}, n^0(\hat{r})) = n^l(\hat{r}) \quad (3.4)$$

³⁶In general, of course, the concave cost structure is an argument for homogeneous communities, ultimately implying societal unilingualism.

creasing the size of the community of non-speakers of the language in question, thereby increasing the *per capita* costs in that community. The ‘naive’ analysis overestimates the efficiency of language rights and underestimates the size of the critical mass due to this effect.³⁷ The net cost effect of the communities’ size changes is negative if the increasing community is a minority and the decreasing one a majority.

3.3 Merit-good arguments

The concept of merit goods was introduced by Richard Musgrave to justify public intervention in cases when the strict basis in individual preferences does not suffice. The reason could reflect the uncertainty of the individuals, their limited access to information, or differences between *ex post* and *ex ante* situations, the latter being the case of education, for instance. After having received an education, I value it more than before receiving it.³⁸ A similar principle can be applied in the case of language rights. We briefly discuss two examples.

3.3.1 Linguistic diversity

Many linguists argue that there is a value in linguistic diversity *per se*.³⁹ One tries to draw parallels to biological diversity, claiming that valuable knowledge is lost to humanity through the demise of linguistic variety. If this is the case, giving rights to minority languages will increase their survival chances and, hence, these rights carry a positive externality.

3.3.2 Language death

As a further illustration of this argument, consider the following example: It is well-known that language death is a process, wherein one domain after another is lost until the language is not used in any domain at all.⁴⁰ Now, consider a situation with two domains, elementary education and university education. The variable r for a given language can be $r_0 = (0, 0)$, $r_I = (1, 0)$, or $r_{II} = (1, 1)$ (the language is not used at all in the educational system, used only in elementary education, or used both in elementary and higher education).⁴¹ The corresponding cost structure is $0 < c_I < c_{II}$ (c_0 is zero by definition). If the propensity to pay is state dependent (states are 0, 1, or 2, the propensity to pay for allocation 0 is, *per definitionem*, zero), $b_I^0 < b_{II}^0$, $b_I^1 < b_{II}^1$ and $b_I^2 < b_{II}^2$, we could easily end up in the following situation:

$$\begin{aligned} b_{II}^2 &> c_{II} > b_{II}^1 > b_{II}^0 \\ b_I^2 &> c_I > b_I^1 > b_I^0 \\ b_I^2 - c_I &> b_{II}^2 - c_{II} \end{aligned} \tag{3.5}$$

³⁷In the case of bilingual or multilingual individuals, the argument has to be slightly more differentiated, but the core remains unaffected.

³⁸For the original source, see MUSGRAVE (1956/1957).

³⁹See, for instance, NETTLE and ROMAINE (2000).

⁴⁰See, for instance, the classic study of GAL (1979).

⁴¹We ignore the case $r = (0, 1)$ as less realistic.

Applying simple cost-benefit analysis, we find via the last expression that higher education should be abolished if one is in State 2. One should keep the elementary education, though. However, due to the negative externality caused by a move from State 2 to State 1 ($b_l^1 - b_l^2$), in State 1, the cost-benefit analysis leads us to abolish primary education as well. That is, neither State 2 nor State 1, which are both sensible rights allocations from the point of view of State 2 and cost-benefit considerations, will survive a gradual cost-benefit analysis. In the long run, the language might perish due to its lack of official status. Under perfect information, one could suggest that the second-best allocation in State 2, r_{II} , should be chosen. This would, measured with the preferences in State 2, lead to a better outcome than choosing the the best allocation in State 2 that ultimately leads us to outcome 0.

Policy conclusion

The introduction of a right for a threatened language l in a certain domain can imply a positive externality, contributing to the survival of the language, thereby also contributing to linguistic diversity.

4 Modifications due to redistribution

One can identify several distribution effects, both direct and fiscal ones, as well as income effects. The distribution effects on the fiscal side are connected with the tax system and its re-distributive properties due to the fact that taxes cannot be freely levied on different individuals. This is in no way different than other tax-financed public activities. The direct effect of language rights can be found both between communities and within communities.

4.1 Fiscal effects

With a fully flexible tax-system – lump-sum taxes levied on an individual basis – the planner can achieve any distribution of implicit income and a first-best maximum of the welfare function with respect to language rights. To find the first-best optimum, one would have to find which language rights are efficient in the sense of Section 3 and then through lump-sum transfers make the implicit income of everyone equal, thereby taking into account that the propensities to pay b are influenced by the implicit incomes. This is, of course, an unobtainable *fata morgana* in the real world.⁴² In reality, the set of possible tax structures is rather limited. The tax structure is determined by a few observable individual parameters, like income, consumption, or wealth. The determination of the tax schedules is the well-known second-best optimal-taxation problem without specific aspects related to language rights and will not be further analyzed here. We will generally assume a fixed tax system and only analyze the direct distributional effects of the introduction of language rights.

⁴²However, in VAN PARIJS (2011) and his other publications, the introduction of English as the sole official language of the European Union could be both efficient and just if the English speakers compensate the non-English speakers sufficiently. An underlying assumption here is that only the communication aspect of the language is important. In that way, efficiency is achieved if only one language is used. If the emotional aspect and its implications for the preference dynamics are considered, the situation is much more complicated, however.

4.2 Distributional properties of language rights

We have to distinguish effects between language groups from effects within language groups.

4.2.1 Between-group effects

In FIDRMUC and GINSBURGH (2007) the per-speaker costs of making a language official in the European Union is calculated. They are by far the lowest for German and by far the highest for Maltese.⁴³ If both a German speaker and a Maltese speaker have the same propensity to pay b for rights for their respective languages and, taking the costs of the German as the unit of measurement, if $1 < b < 230$, the cost-benefit analysis would tell us to introduce the right for German, but not for Maltese. If the normative point of departure is no right for anyone and if the *per capita* tax rate is the same for everyone, the consequence would be that the German speaker has a gain of $b - t$, and the Maltese speaker a loss of t , the *per capita* tax rate. If the individuals in the two groups are equal in the eyes of the planner, this would be in line with the welfare analysis, maximizing the differences between benefits and costs. However, if the lower implicit income of the Maltese speaker gives her a higher weight β in the welfare function, in a first-best world the German speakers should compensate her until the implicit incomes are equal (and then also the corresponding β 's). In a second-best world with equal division of all costs, the average *ex post* implicit incomes (weighted by the β 's) in the two situations with and without rights for Maltese should have to be compared, and if b is above a certain value, the result would be the introduction of the rights for Maltese, although it would not be efficient.⁴⁴ This argument can be carried further. If a linguistic minority is poorer than the general population or discriminated against, and tax subsidies or other transfers are not politically possible, then the introduction of language rights beyond the level coming from the cost-benefit efficiency measure would be an indirect way of compensating the members of the group for the disadvantages they face.⁴⁵

⁴³Letting the per-speaker costs of German be the *numéraire*, the per-speaker costs of English and French are 1.5, and the costs of Maltese are 229.2. That is, if taxes were levied on the users of the language, for a certain level of services a German-speaker would have to pay € 1, an English-speaker would pay € 1.50 and a speaker of Maltese almost € 230 a year.

⁴⁴If there are only Maltese and German speakers in the Union, if costs are divided equally, if there are n_m Maltese speakers as well as n_g German speakers, and if the costs per language are c , then the implicit income distribution in the absence of rights for Maltese (0) is $(b - \frac{c}{n_g+n_m}; -\frac{c}{n_g+n_m})$ and in the presence of Maltese rights (1) $(b - \frac{2c}{n_g+n_m}; b - \frac{2c}{n_g+n_m})$. If the rights for the Maltese speakers are present, the German and Maltese speakers would have the same implicit incomes (ignoring other possible differences). In the absence of rights, the implicit income of the Maltese is lower than that of the Germans. Let the weights of the planner be $\beta_m^0 =: \beta^0 > \beta^1 := \beta_g^0 = \beta_g^1 = \beta_m^1$. The comparison is then between $W^0 = \beta_g^0 n_g (b - \frac{c}{n_g+n_m}) - \beta_m^0 n_m \frac{c}{n_g+n_m}$ and $W^1 = \beta_g^1 n_g (b - \frac{2c}{n_g+n_m}) + \beta_m^1 n_m (b - \frac{2c}{n_g+n_m})$. The difference is $W^1 - W^0 = \beta^1 n_g (b - \frac{2c}{n_g+n_m}) + \beta^1 n_m (b - \frac{2c}{n_g+n_m}) - \beta^1 n_g (b - \frac{c}{n_g+n_m}) + \beta^0 n_m \frac{c}{n_g+n_m} = n_m \beta^1 b + \frac{c}{n_g+n_m} [n_m \beta^0 - 2n_m \beta^1 - \beta^1 n_g]$. Let $\varepsilon = \frac{c - n_m b}{c}$ be the difference between costs and aggregated propensity to pay for the rights for Maltese as a fraction of costs. Substituting for $n_m b$, we find $W^1 - W^0 = \frac{n_m}{n_g+n_m} \frac{\beta^0 - \beta^1}{\beta^1} - \varepsilon$. If the Maltese community is not too small and the planner's redistribution inclination sufficiently high, it is welfare improving to introduce rights for Maltese even though the efficiency criterion fails by a fraction ε .

⁴⁵One could speculate further here. The introduction of minority rights for a community like the Roma in some countries might lead to an increase in the culture's pride and thereby become a means of acceptance

If the average propensities to pay are different for the two groups (b_g and b_m , $b_g > 1$), and the costs are divided equally, the choice of *status quo* shows its importance. If the basic right is no right, $\bar{r} = \textcircled{0}$, then, if no rights are in effect, we have an equal distribution. If the rights are introduced for both languages and financed over the general budget, a German would have a gain of $b_g - t^*$ and a Maltese of $b_m - t^*$, where t^* is the *per capita* cost of this rights allocation. The change in the difference in implicit income would be $b_g - b_m$. If $b_m < 230$, the cost-benefit analysis tells us to introduce the right for German, but not for Maltese. The consequence would be that the German speaker has a gain of $b_g - t$, and the Maltese speaker a loss of t . The change in the difference in implicit income is b_g . If, on the other hand, the *status quo* is $\bar{r} = \textcircled{1}$ and if $b_m > 230$, the right would be kept for both languages, and we stay in the *status quo*. There is no change. If $b_m < 230$, the Maltese speakers should, according to the cost-benefit analysis, be deprived of their rights and tax money would be freed. They would have a change in implicit income that is $t^{**} - b_m$ and the German speakers would have an increase in implicit income of t^{**} , the *per capita* tax money freed. The change in the difference of the implicit incomes would then be $b_m (\neq b_g)$. That is, a given rights allocation has different distributional characteristics dependent on the definition of the *status quo*.

In conclusion, the distribution analysis in addition to the planner's preferences for redistribution also depends on the assumptions of the rights distribution in the *status quo* if the propensity to pay differs between the individuals. That is, we have no unique way of introducing equality.⁴⁶

Policy conclusion

In a second-best world, the introduction of rights for a language l spoken by a small or disadvantaged group could contribute to a more equal distribution of implicit income. The policy conclusion is that the 'naive' cost-benefit analysis underestimates the optimal extent of language rights and, hence, overestimates the size of the critical mass necessary to justify minority rights.

4.2.2 Within-group effects

Empirical evidence tells us that language skills are distributed very unevenly over socio-economic characteristics in the society and are generally seen as positively correlated with income.⁴⁷ That is, rights for a minority language are likely to open more doors for the low-income person than for the high-income one. At the same time, the 'need' to contact official institutions might vary strongly between situations.⁴⁸

and inclusion in the larger society.

⁴⁶One could call the allocation $\bar{r} = \textcircled{1}$ liberalism and $\bar{r} = \textcircled{0}$ absolutism. For a further discussion, see WICKSTRÖM (2007).

⁴⁷The knowledge of foreign languages in the European Union is analyzed in great detail in GAZZOLA (2014a) and GAZZOLA (2014b). He finds, among other things, a strong correlation between income and language skills as well as between educational level and language skills.

⁴⁸If we are at the level of the European Union, the necessity to contact EU institutions is probably positively correlated with income. However, the high-income speaker of a small language is likely to master one of the big languages in Europe. Hence, the propensity to pay for rights for the small language might not be too high. The need to have rights in Finnish, say, might not be too critical, since the high-income Finn is

In addition to these rather pragmatic arguments, there is the emotional value of having one's language accepted as an equal with all other ones.⁴⁹ This part of the propensity to pay might have the properties of a normal good (income elasticity greater than zero), if not a luxurious good (income elasticity greater than one).⁵⁰ In either case, the propensity to pay would be positively correlated with income.

Finally, most tax schedules are such that tax payments are progressive: the marginal tax rate on income increases with income, and the fiscal costs associated with the introduction of rights are strongly and positively correlated with income.⁵¹ One can safely assume that the income elasticity of the tax payments is greater than one. To find the within-group redistribution effects of the introduction of language rights, we need to find the distribution of net benefits, the Δa^i 's. Bringing the different arguments together, it is not clear how the net benefits are correlated with income. The communication values discussed above seem to indicate that in that example the language rights in relation to the EU are a luxurious good (income elasticity greater than one), but at the national level rather an inferior good (income elasticity negative). The emotional argument, however, could have the properties of a luxury good. This, taken together with the tax schedule can give us both a negative and a positive correlation of net benefits with income. What we can say, though, is that rights at the EU level are less likely to redistribute in favor of low incomes than rights on the local level.

Policy conclusion

The introduction of a right for a language l spoken by a minority would affect the distribution of implicit income. Assuming that the net value of the introduction of language rights is negatively correlated with income, the extent of the right should be beyond that given by the simple cost-benefit analysis; that is, the critical mass needed is lower than in the cost-benefit case. Furthermore, this argument for more extensive rights in comparison to the cost-benefit analysis is stronger the lower the level of government. That is, in the European Union on the local level, the cost-benefit criterion should be modified the most and on the EU level the least.

4.3 Income effects

The income effects are the result of the fact that language rights are discrete variables. If certain rights are given to a certain language community, this can be seen as a discrete increase in implicit income. If, in turn, the planner wants to redistribute to 'poorer' com-

likely to master English or German at a sufficiently high level. On the other hand, for the Swedish-speaking farmer in Österbotten, who in his work is forced to have a fair amount of contact with central authorities in Helsinki/Helsingfors, the rights provided to the Swedish language in Finland might be of crucial importance.

⁴⁹In many cases, this would be the principal argument since there are hardly any communication problems. Catalan and Gallego in Spain are close enough to Castellano that with some good will on all sides most communication problems can easily be solved. Also, in many minority communities, like the Welsh, Irish, or Basque speakers, virtually all individuals are bilinguals, thereby removing the communication aspects from the propensities to pay.

⁵⁰Anecdotal evidence seems to indicate the latter. Many movements for the preservation of minority languages seem to be dominated by intellectuals.

⁵¹We remind the reader that we are taking the tax schedule as given.

munities and, hence, gives them a weight higher than the ‘richer’ communities, then, due to the increase in the implicit income of the poorer community, their relative weight β in the welfare function has to decrease. Hence, *ex post* the evaluation of the situation is lower than what one *ex ante* might have assumed.

Policy conclusion

The introduction of a right for a language l spoken by a poor minority would make their implicit income higher. The policy conclusion is that the *ex ante* ‘naive’ analysis overestimates the optimal extent of language rights.

5 Conclusions

In this essay we have tried to examine systematically the factors influencing the normative arguments for the allocation of language rights from a welfare-economics point of view. We have seen that— because of Scitovsky-like ‘paradoxes’— the welfare analysis provides contradictory results in some cases. Even when this is not the case the simple cost-benefit analysis should be augmented in various directions. Both types of effects are caused by the assumption that language policies induce changes in individual propensities to pay as well as in the distribution of propensities to pay in the population, the latter effect being caused by changes in the transmission of language use from one generation to the next.

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 ignored.⁵² Put in a different way, one could also ask which domains should be regulated by legal means.

Also the question of what constitutes a legitimate minority has not been 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 become the legitimate majority in a territory and left-over members of the old majority a ‘normal’ minority?⁵³ This opens up many interesting, contradictory and important questions, which can be approached and partially resolved by economics methodology.⁵⁴

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⁵²Some of these issues are touched upon by Grin in this volume.

⁵³One may think of Native Americans both in North and South America.

⁵⁴For a simple analysis, see WICKSTRÖM (2014)

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A Appendix: Formal analysis

A.1 Introduction

In this appendix we illustrate the discussion in the main body of the chapter with a simplified but stringently analyzed model.

A.1.1 Notation and 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 initial size n^A and n^B . Further, the propensities to pay are positive only for the proper language.⁵⁵ We only consider one domain, and the taxes paid by individual i for financing a right of language L in this domain is denoted by θ^{iL} . We write $\sum_{i \in N^A} (\theta^{iA} + \theta^{iB}) =: \theta^{AA} + \theta^{AB} =: \theta^A$ and correspondingly for community B . We 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 introduction of the right will alter the size of the B community by $\Delta n^B =: \Delta n \geq 0$ and of the A community by $\Delta n^A = -\Delta n \leq 0$. These individuals are found in the set ΔN . For the sake of simplicity, we assume that the characteristics of the individuals in this set are distributed like those of the individuals in the set N^A initially and as those of the individuals in the set N^B after the introduction of the right. Define δ^A as $\frac{\Delta n^A}{n^A}$ and δ^B as $\frac{\Delta n^B}{n^B}$. Note that $-\frac{\delta^A}{\delta^B} = \frac{n^B}{n^A}$ is the initial ratio of the number of minority to majority speakers. The introduction of the

⁵⁵That is, the propensity to pay $b^{iL} > 0$ if $i \in N^L$ and $b^{iL} = 0$ if $i \notin N^L$.

right also has a ‘status’ effect on the B community; this is denoted by σb . Since the right is in effect for A , the ‘status’ effect on the A community is already incorporated in b^{iA} .

A.2 Welfare analysis

If the right is introduced only for language A but not for language B , the welfare change from the *status quo* (no rights) is given by:

$$\sum_i \beta^i \Delta a_0^i = \sum_{i \in N^A} (b^{iA} - \theta_0^{iA}) \beta_0^i - \sum_{i \in N^B} \theta_0^{iA} \beta_0^i \quad (\text{A.1})$$

Here, $\beta_0^i := \beta(\omega^i, b^{iA} - \theta_0^{iA})$.⁵⁶

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

$$\begin{aligned} \sum_i \beta_1^i \Delta a_1^i &= \sum_{i \in N^A \setminus \Delta N^A} (b^{iA} - \theta_1^{iA} - \theta_1^{iB}) \beta_1^i \\ &+ \sum_{i \in N^B \cup \Delta N^B} (b^{iB} + \sigma b^{iB} - \theta_1^{iA} - \theta_1^{iB}) \beta_1^i \end{aligned} \quad (\text{A.2})$$

Here, $\beta_1^i := \beta(\omega^i, b^{iA} + b^{iB} + \sigma b^{iB} - \theta_1^{iA} - \theta_1^{iB})$.⁵⁷ We isolate the dynamic effects discussed in Section 3.2, defining $\Delta \theta^{iA} := \theta_1^{iA} - \theta_0^{iA}$ and $\Delta \theta^{iB} := \theta_1^{iB} - \theta^{iB}$, where θ^{iB} is the (fictitious) value of θ_1^{iB} when $\Delta n = 0$. In the following, we write θ_0^{iA} as θ^{iA} . Again, let it be noted that we do not claim to carry out a true dynamic analysis, but simply a comparative-static analysis of different steady states.

We find the following expression for the difference in welfare:

$$\begin{aligned} \Delta W &= \sum_{i \in N^A} [(b^{iA} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i - (b^{iA} - \theta^{iA}) \beta_0^i] \\ &- \sum_{i \in \Delta N} (b^{iA} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i \\ &+ \sum_{i \in \Delta N} (b^{iB} + \sigma b^{iB} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i \\ &+ \sum_{i \in N^B} [(b^{iB} + \sigma b^{iB} - \theta^{iA} - \Delta \theta^{iA} - \theta^{iB} - \Delta \theta^{iB}) \beta_1^i + \theta^{iA} \beta_0^i] \end{aligned} \quad (\text{A.3})$$

This can be written as:

⁵⁶That is, if $i \in N^A$, $\beta_0^i := \beta(\omega^i, b^{iA} - \theta_0^{iA})$, and if $i \in N^B$, $\beta_0^i := \beta(\omega^i, -\theta_0^{iA})$

⁵⁷That is, if $i \in N^A \setminus \Delta N^A$, $\beta_1^i := \beta(\omega^i, b^{iA} - \theta_1^{iA} - \theta_1^{iB})$, and if $i \in N^B \cup \Delta N^B$, $\beta_1^i := \beta(\omega^i, b^{iB} + \sigma b^{iB} - \theta_1^{iA} - \theta_1^{iB})$.

$$\begin{aligned} \Delta W = & \sum_{i \in N^A} [(b^{iA} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}) (1 + \delta^A)\beta_1^i - (b^{iA} - \theta^{iA}) \beta_0^i] \\ & + \sum_{i \in N^B} [(b^{iB} + \sigma b^{iB} - \theta^{iA} - \Delta\theta^{iA} - \theta^{iB} - \Delta\theta^{iB}) (1 + \delta^B)\beta_1^i + \theta^{iA} \beta_0^i] \end{aligned} \quad (\text{A.4})$$

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

Using the fact that

$$\sum_i x^i \beta^i = \overbrace{\sum_i x^i \beta^i}^{\text{inter-group effects}} + \overbrace{\sum_i x^i \beta^i}_{\bar{x}\bar{\beta}V_x}^{\text{intra-group effects}} \quad (\text{A.5})$$

with $x := \sum_i x^i$, $\bar{\beta} := \sum_i \beta^i / n$, and $V_x := [\sum_i (x^i - \bar{x})(\beta^i - \bar{\beta})] / (x\bar{\beta})$, the expression can be decomposed into several partial effects:⁵⁸

$$\begin{aligned} \Delta W = & \overbrace{\bar{\beta}_1^B [(b^B + \sigma b^B) (1 + \delta^B) - (C^B + \Delta C^B)]}^{\text{direct net benefit for } B} \\ & + \overbrace{[\bar{\beta}_1^A (1 + \delta^A) - \bar{\beta}_0^A] b^A - \bar{\beta}_1^A (C^A + \Delta C^A) + \bar{\beta}_0^A C^A}_{\text{externality on } A} \\ & + \overbrace{(\bar{\beta}_1^B - \bar{\beta}_1^A) [(\theta^A + \Delta\theta^A) (1 + \delta^A) - C^A - \Delta C^A] + (\bar{\beta}_0^B - \bar{\beta}_0^A) \theta_0^B}_{\text{fiscal redistribution}} \\ & + \overbrace{V_b^A b^A [\bar{\beta}_1^A (1 + \delta^A) - \bar{\beta}_0^A] + V_b^B (b^B + \sigma b^B) \bar{\beta}_1^B (1 + \delta^B)}^{\text{intra-group distribution effect in communities } A \text{ and } B \text{ due to the right given to } B} \\ & - \overbrace{V_\theta^A [(\theta^A + \Delta\theta^A) \bar{\beta}_1^A (1 + \delta^A) - \theta_0^A \bar{\beta}_0^A]}^{\text{intra-group distribution effect of taxes in community } A} \\ & - \overbrace{V_\theta^B [(\theta^B + \Delta\theta^B) \bar{\beta}_1^B (1 + \delta^B) - \theta_0^B \bar{\beta}_0^B]}^{\text{intra-group distribution effect of taxes in community } B} \end{aligned} \quad (\text{A.6})$$

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

A.3 Efficiency

Expression A.6 consists of several effects. Ignoring the distribution effects, that is, setting all $\beta^i = 1$, the equation reduces to:

$$\Delta W = (b^B + \sigma b^B) (1 + \delta^B) - (C^B + \Delta C^B) + (\delta^A b^A - \Delta C^A) \quad (\text{A.7})$$

⁵⁸Note that the total taxes in the two groups if the right for B is not introduced are $\theta^{AA} =: \theta_0^A$ and $\theta^{BA} =: \theta_0^B$. Also, tax revenue equals costs: $(1 + \delta^A)(\theta^{AA} + \Delta\theta^{AA}) + (1 + \delta^B)(\theta^{BA} + \Delta\theta^{BA}) = C^A + \Delta C^A$ and $(1 + \delta^A)(\theta^{AB} + \Delta\theta^{AB}) + (1 + \delta^B)(\theta^{BB} + \Delta\theta^{BB}) = C^B + \Delta C^B$.

Letting all delta variables equal zero, we obtain the benchmark case. The different external effects discussed in Section 3 can also readily be found: the positive status effect due to σb and the dynamic effects, positive on community B and negative on community A . With a concave cost function, welfare is reduced due to the change in costs and the decrease in community A and increased due to the status effect and increase in community B .

A.4 Distribution

As in the main text, we have to distinguish between inter-community and intra-community effects.

A.4.1 Distributional effects between the communities

If the communities are unequal in the eyes of the planner, there are, as we noted in Section 4, redistribution effects due to income differences, changes in implicit income, and fiscal externalities. These effects are easily identified in the formal model of equation A.6. If the B community is poorer than the A community, the β^B 's are on average greater than the β^A 's. If, on the other hand, the B community is richer than the A community in general, that is, if the minority is a small elite, the following argument is, of course, reversed. The introduction of the right for B will in the first case have an additional positive effect on welfare if the B community would pay part of the rights for A in the absence of rights for B and/or the A community pays more in taxes for the rights allocation than the costs of the rights for A . This would, of course, be the case with equal taxes for all individuals. Since, in this case, the introduction of the right increases the implicit income of the members of the B community and decreases implicit income of the A community (due to the increased taxation), the values of the β 's will increase for the A 's and decrease for the B 's, which to some extent reduces the effect.

A.4.2 Distribution effects within the communities

There are distribution effects due to the propensity to pay as well as taxation. The effect due to the propensity to pay is clear. The sign of V_b determines the sign of the effect attributable to the B community. The total effect can be reduced due to the decrease in the size of the A community if the income effect on β^A is small enough. It is not likely to change the sign of the total effect, though, since it is an order of magnitude smaller than the effect coming from the B community. Hence, the effect will be positive if the demand for language rights has a negative income elasticity, that is, if rights are an inferior good, giving us an argument for more extensive rights for the minority. If the income elasticity is positive, the effect is an argument for less extensive minority rights.

If taxes are positively correlated with income, all V_θ are negative if the planner wants to redistribute from the poor to the rich. However, the income effect will make β^A bigger and β^B smaller. At the same time, δ^A is negative and δ^B positive. Hence, we cannot unambiguously determine the sign of the effect of the additional taxes necessary to pay for the introduction of the right for language B . On the other hand, following the public-finance tradition, we could separate the taxation problem from the expenditure side, and refer the optimal taxation to another 'table'.

A.5 Conclusions

In the formal analysis as in the main text, we have seen that there are arguments for more extensive language rights for a minority than what comes out of a ‘naive’ cost-benefit analysis. But there are also arguments for an optimal discrimination.

The property justifying discrimination in this sense is the concave cost structure. Generally, due to concavity, the *per capita* costs of a certain right increases more 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 externalities on the majority provides arguments for more extensive rights for the minority than implied by the simple cost-benefit analysis. Finally, distributional effects within the communities provide arguments for more rights for the minority if language rights are inferior goods.

Table 1 summarizes these effects.

Table 1. Direction of Different Welfare Effects (last row) of the Realization of Minority Rights in Addition to the Benchmark Case.

Dynamic effect		Positive fiscal externality on A		Income effect		Demand distribution	
σb^B		Minority/majority income difference		Fiscal externality on A		Language rights	
positive	zero	negative	positive	negative	positive	inferior	normal
+/-	-	+	-	-/+	-	+	-